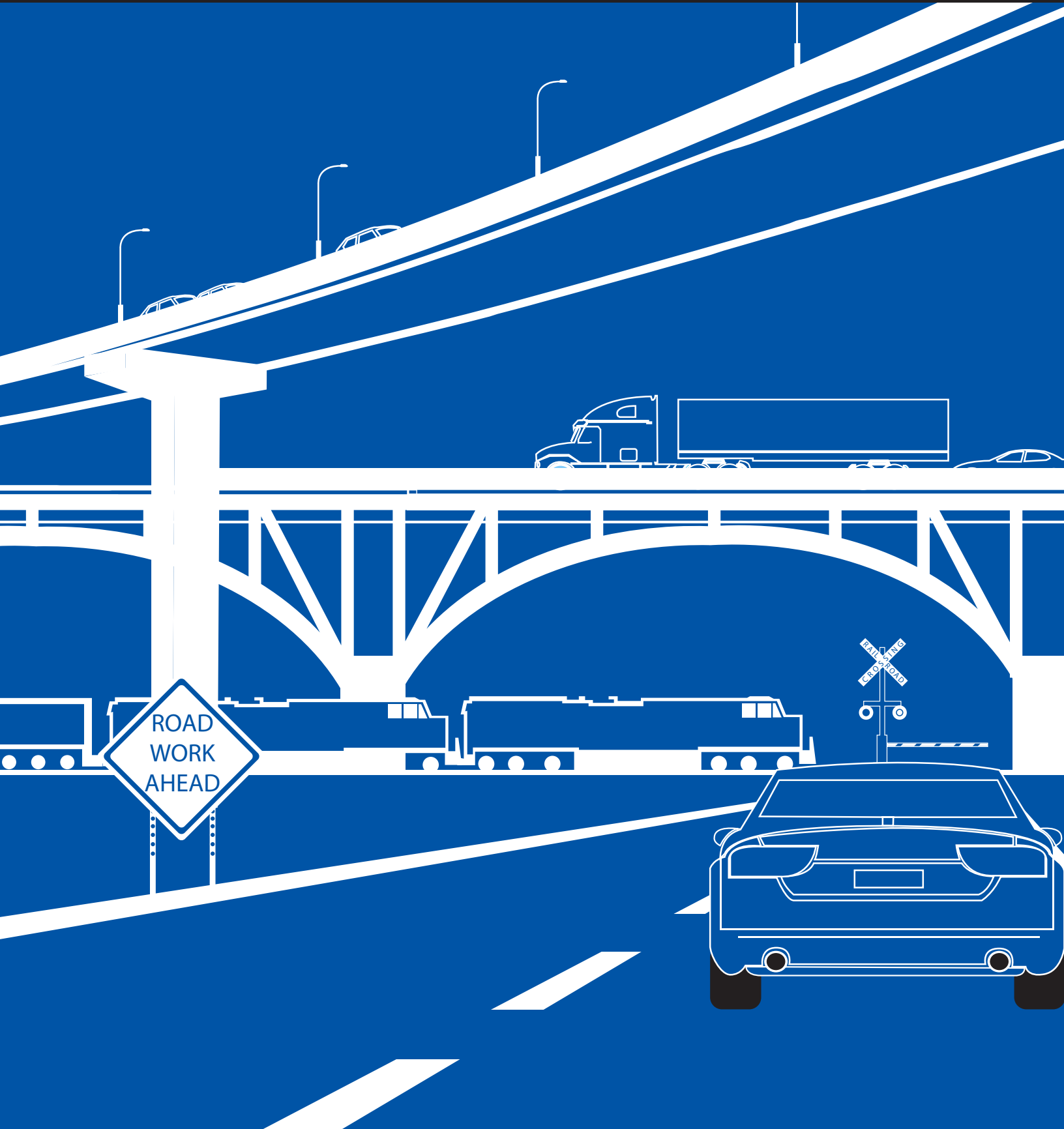




Reducing Construction Costs Through Effective Field Communication and Administration

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Kentucky Transportation Center
College of Engineering, University of Kentucky, Lexington, Kentucky

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Research Report
KTC-19-13/SPR18-555-1F

Reducing Construction Costs Through Effective Field Communication and Administration

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16. Abstract Falling Road Fund receipts have placed added strain on the Kentucky Transportation Cabinet's (KYTC) already-underfunded highway program. Revenue declines have increased the urgency of improving the efficiency and cost-effectiveness of the Cabinet's operations. One method KYTC can use to realize greater cost savings is improving the administration of construction projects. Effective field communication and administration helps control construction costs, enhances quality, and minimizes delays and claims. One challenge the Cabinet will need to confront to more effectively administer projects, however, is the loss of institutional knowledge associated with staff attrition. The report documents KYTC current methods for project staffing, communication, and partnering. It summarizes best practices for field communication and administration used throughout the private and public sector construction industries and discusses findings obtained through interviews with Cabinet staff and industry representatives on the issues in-house staff and external contractors routinely negotiate during projects. Based on analysis of these interviews and the literature reviewed, the report identifies five issues that are commonly encountered on KYTC construction projects and puts forward recommendations for ameliorating them. Additionally, it proposes a new initiative — <i>Putting the Project First</i> — which has as its goal the development of tools, practices, guidance, and training to meet stakeholder needs across all project types. Several recommendations, which can be enacted over the short-, intermediate-, and long-term are advanced to build a sound and practical foundation for all <i>Putting the Project First</i> activities. This initiative will strengthen relationships between the Cabinet and its contractors. It will also help build an institutional framework for conducting field communications and administration, one resilient in the face of staff turnover.			
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Executive Summary

Declines in Road Fund receipts have placed additional strain on the Kentucky Transportation Cabinet's (KYTC) already-underfunded highway program. In response, the Cabinet has ratcheted up its focus on improving efficiency and finding areas in which to reduce costs. One method for realizing cost savings is through the improved administration of construction projects. Adopting effective field communication and administration strategies controls construction costs, enhances quality, and minimizes delays and claims. Staff attrition has diminished institutional knowledge of these practices, however.

This project reviewed KYTC practices for project staffing, communication, and partnering as well as best practices used throughout the public and private sector construction industries. Based on interviews with Cabinet staff and contractor personnel, this report provides practical guidance for managing staff levels, conducting effective field communication, and facilitating supplemental agreements in an efficient and fiscally judicious manner is provided.

Summary of Interviews and Recommendations

The Kentucky Transportation Center (KTC) research team analyzed the comments of interviewees to identify common themes and trends. Based on this evaluation, researchers pinpointed five major issues common to KYTC construction projects as well as corresponding recommendations for future improvement. These issues identified and recommendations for solving them are presented in the figure on the next page.

Projects not administered using the partnering philosophy commonly suffer from the first three issues captured. While there is no individual solution that will resolve all of these issues, all projects should have regularly scheduled update meetings, a documented and well-understood issue escalation procedure, and receive buy-in from all parties around a common set of project goals. For most projects — especially smaller ones — a brief discussion at the end of the Preconstruction Conference will suffice to accomplish these goals. The frequency of update meetings should be project-specific decision made by the Section Engineer and Contractor Field Superintendent. A generic template for an escalation ladder can be developed for smaller projects and modified in response to the specifics of each project. For larger or more complex projects, these processes may need to be more formal; an additional meeting before the project begins may also be necessary.

The final two issues speak to a need for more relevant construction experience among staff and the absence of an organizing management philosophy. Formal training and mentoring hold the most promise for addressing these challenges. At a minimum, these issues can be discussed and highlighted during Section Engineer Meetings, TEBM Meetings, and annual district training. Management support and emphasis on these issues is critical for achieving buy-in at the project level.

Researchers recommend a two-phase approach to resolve with these issues. First, formal training should be developed that includes tools to ameliorate each of the five issues presented. The training could be a standalone event or included as a module in the Construction Management Academy. Second, we recommend the development of a leadership-supported initiative that encourages the

administration of construction projects be oriented around a philosophy that emphasizes common project goals, fosters communication, and empowers field personnel to make decisions at the project level. Both recommendations are salient regardless of whether a project is inspected entirely by KYTC forces, supplemented by contract employees, or by consultants.

1. Consistent and constructive communication is a necessity between inspection crews and contractors. Current practices hampering this objective:

- The lack of regular project meetings.
- Discussions or decisions are not documented.
- Excessive response times.

Recommendation: For each project, establish an agreed-upon frequency for progress meetings. Items discussed at meetings should be documented, shared, and approved by all parties.

2. A well-defined decision-making ladder is needed for project efficiency. Current practices hampering this objective:

- There is no consistent decision-making authority at the project level.
- Management is often perceived as more of an auditor than as a supporting agency.
- Approval time of submittals and project requests is excessive.

Recommendation: Devise an escalation ladder for decision-making authority based on project complexity and cost. Both Management and district offices should encourage and support decision making at the project level.

3. All stakeholders must be accountable for a project's success. Current practices hampering this objective:

- Inspectors often appear to take no ownership in their projects.
- Potential issues are not addressed in a timely manner. Left unaddressed, these often become major issues.
- Relationships with contractors are adversarial.

Recommendation: Work with contractors to establish shared project goals and objectives.

4. Construction expertise and experience levels must increase. Pressing challenges:

- Current staff are inexperienced — *not incompetent*.
- There are no subject-matter experts to offer project-level guidance to field personnel.
- Total years of experience should not be equated with total years of construction experience.

Recommendation: Develop a Section Engineer training class to encourage mentorship and build experience and knowledge.

5. Construction project administration requires a program management approach. Pressing challenges:

- Inefficiencies from the 2008 reorganization linger due to inadequate staffing levels.
- Too often the emphasis is only on saving money and not on getting the best value.
- Projects should be constructed to achieve a 20- to 25-year service life rather than 5-10 years.

Recommendation: Refresh and update Construction Management Academy modules focused on topics like construction conflicts and partnering.

The programmatic solution discussed in Chapter 4 blends concepts from risk management, organizational behavior and management (i.e., soft skills), and partnering. Dubbed the Putting the Project First (PPF) initiative, the objective of this program is to develop tools, practices, guidance, and training to meet stakeholder needs across all project types. The object of PPF is to develop

tools, practices, guidance, and training to meet the needs of all stakeholders across all project types. An overview of the program and its contents can be found in the table below.

Putting the Project First Overview	
Project Types	Small Project:
	Medium Project:
	Large/Complex Project:
Stakeholder Guidance	KYTC & Contractor
	Staff Level
	Advisory Level
	Management Level
	Executive Level
Tools, Practices, Guidance and/or Policy	Reboot of the Construction Management Academy
	Issue Documentation Matrix
	Issue Escalation Ladder
	Section Engineer Cheat Sheet
	Best Practices for Subject-Matter Experts: <ul style="list-style-type: none"> Guidance for those providing technical and managerial support
	Electronic Toolbox and Best Practices Guide: <ul style="list-style-type: none"> Examples of tools — Templates for Issue Documentation Matrix, Issue Escalation Ladder, form letters to contractors Examples of Best Practices — Communication Response Guide
Areas of Emphasis	Establish Project Goals and Objectives: <ul style="list-style-type: none"> Meeting Frequency Revisions to Preconstruction to deal with all of these bullets Section Engineer Field Visit Frequency Schedule and Progress Meetings Relationships, Respect, and Understanding
	Escalation and Empowerment: <ul style="list-style-type: none"> Field decisions guidance Issue Escalation Ladder and guidance
	Communication and Documentation: <ul style="list-style-type: none"> Meeting documentation with action items and due dates Issue Documentation Matrix Communication guidance (form and format)
	Effective Management and Providing Subject-Matter Expertise: <ul style="list-style-type: none"> Section Engineer Orientation How to effectively provide subject-matter expert support Rebrand partnering philosophies (i.e., PPF)

1. Introduction and Background

The Kentucky Transportation Cabinet (KYTC) is responsible for constructing new roads, upgrading existing corridors, and maintaining the eighth largest state road system and the seventh largest inventory of state-maintained bridges in the United States. Such a large portfolio of assets demands a correspondingly well-staffed state transportation agency to oversee its development and maintenance. However, due to a variety of issues those staffing levels have not been attained. Figure 1 shows illustrates trends in construction spending and staffing levels at KYTC since 1990. Since 1990, spending has increased 92% while the number of employees has declined 31%. As contracts and project specifications grow more complex, reduced staffing levels more significantly impact project performance.

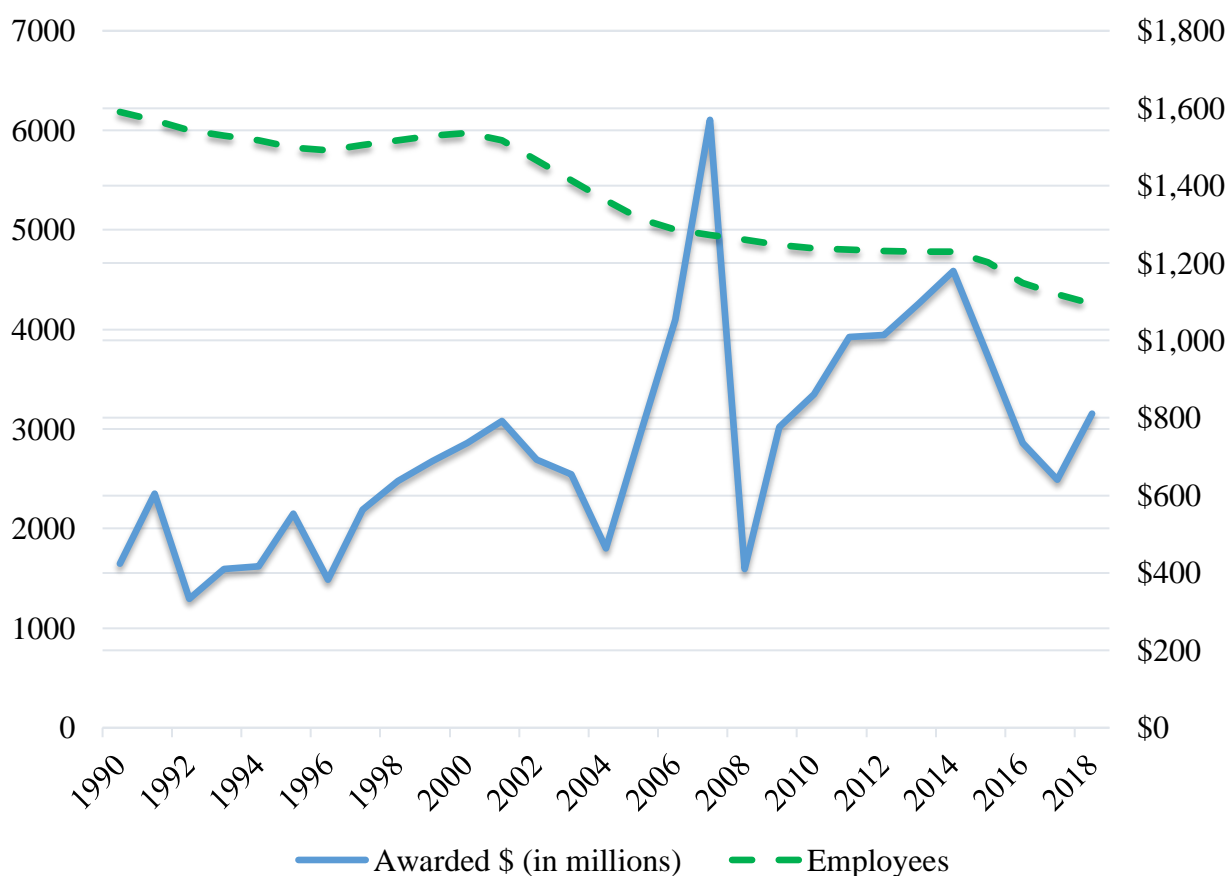


Figure 1 KYTC Construction Spending vs. Staffing Levels (1990-2018)

The loss of staff is complicated by the increasing rate of retirements. If positions vacated by retirees are backfilled, less experienced personnel occupy these roles. According to Kentucky Retirement Systems (KRS) data, the number of retirees in the pension system has increased from 1,385 in 2010 to 3,010 in 2018 [1, 2]. While these figures encompass all public employees, the Cabinet has witnessed similar trends. This presents an opportunity to attract new employees who will have opportunities for accelerated career advancement. However, stagnant salaries, deteriorating

benefits, and a robust and competitive private industry sector have steered prospective employees away from KYTC.

Maintaining effective project communication among all stakeholders is particularly critical when there are fewer and less experienced staff. Poor field communication can prompt disagreements, which may escalate to a dispute (Figure 2). Disputes and tensions strain the relationship between KYTC and its contractors and requires costly and timely dispute resolution measures. In North America in 2016, the average construction dispute lasted 15.6 months and cost \$21 million [3].

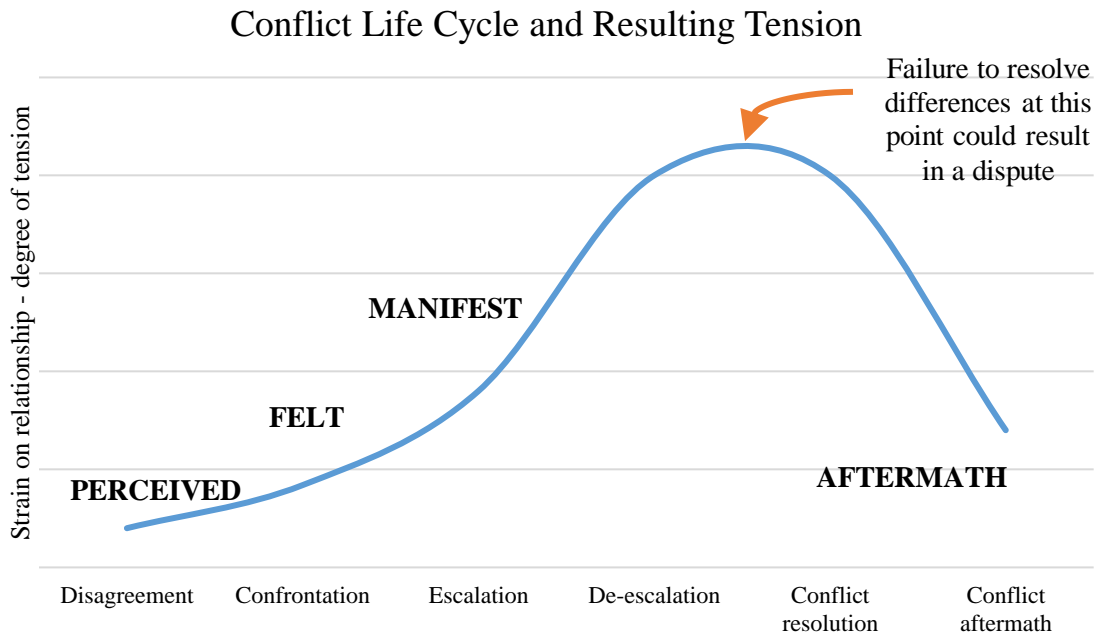


Figure 2 Conflict Life Cycle and Resulting Tension. Adapted from Emmitt and Gorse, 2003 [4]

Despite the significant costs imposed by disputes, little attention has been paid to disseminating important information and helping employees build the skills that could help improve field communication on KYTC projects.

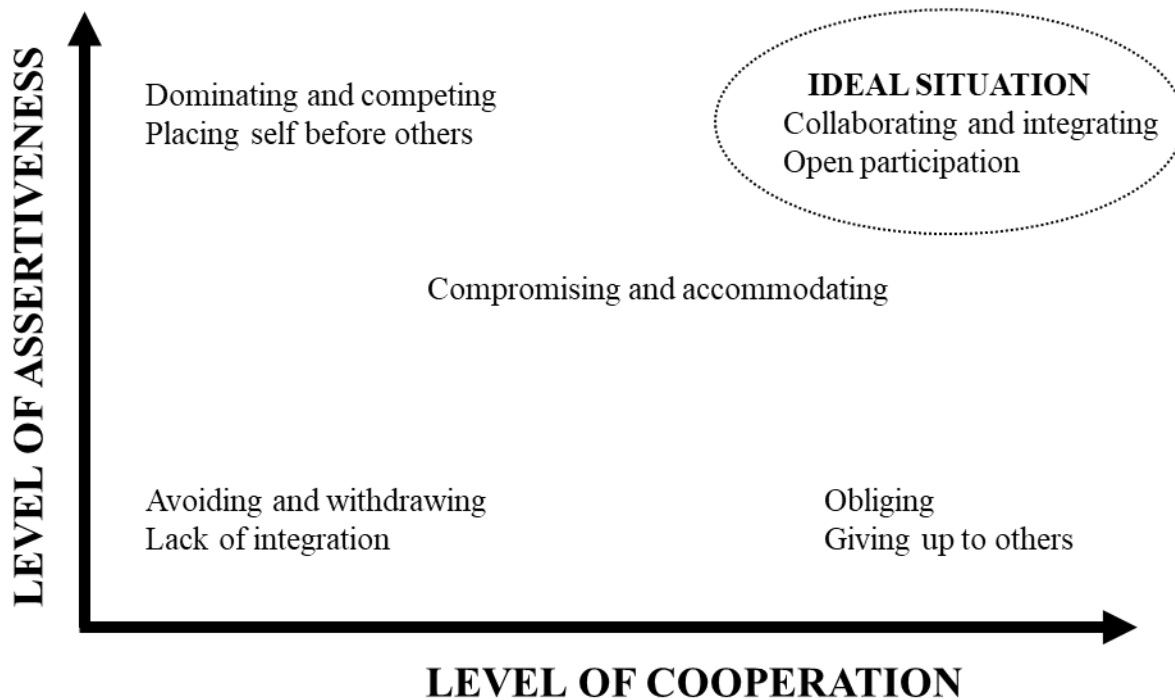


Figure 3 Conflict-Handling Styles. Adapted from Thomas & Kilmann 1975 [5], Thomas 1976 [6], Rahim 1983 [7].

As part of this research, our Kentucky Transportation Center (KTC) research team interviewed current and former KYTC employees, as well as some of the agency’s major contractors, to understand existing challenges and identify strategies to strengthen relationships between the Cabinet and its construction partners. The primary objective of this work is to provide guidance for managing staff levels and field communication and facilitating supplemental agreements in an effective and fiscally judicious manner. To meet this primary objective, we pursued several secondary objectives:

- Identify successful strategies for conducting effective field administration during construction projects;
- Assess KYTC’s current level expertise in field administration and determine future training and guidance needs;
- Outline and begin preliminary development of KYTC-specific training and guidance for effective field administration of construction projects; and
- Work with KYTC leadership to develop a succession plan that ensures field administration skills are maintained regardless of personnel changes.

This report documents our research methodology, findings, and recommendations. Chapter 2 reviews academic literature as well as department of transportation (DOT) policy manuals. Chapter 3 discusses the interviews of KYTC and contractor personnel. Chapter 4 presents recommendations growing out of our interviews and proposes the *Putting the Project First* initiative. A final chapter highlights conclusions.

2. Effective Communication Literature Review

2.1 The Importance of Effective Communication

In the construction industry, communication is defined as “the transmission of meaning from one person to another or many people, whether verbally or non-verbally.” [8] So critical is effective communication that many practitioners refer to it as the lifeblood of a project [9]. Strong communication is a must-have for any successful construction project, and therefore its importance should not be underestimated by any individual or project team. Given the nature of the industry and the large number of stakeholders involved on any project, communication conflicts are inevitable. According to Gómez-Ferrer [10], most communication problems that arise in the industry fall into one of the following categories: document management, informality of many communications, and early reductions in bid prices. Failure to resolve communications-related challenges early in a project significantly increase the cost of corrective action [11].

Feedback plays a key role in effective communication. When feedback is absent or delayed, interventions are necessary to bolster communication [12]. If feedback is missing, it can lead to misunderstandings and give rise to differing expectations among various stakeholders. It is imperative that receivers confirm to senders that they understand their message, because communication is ineffective without understanding [13]. The likelihood of having ineffective communication increases as the number of stakeholders involved in a project climbs. The added noise introduced by additional stakeholders occasions forgetfulness, laziness, and prejudices which can affect people’s goals and attitudes. Lastly, it is important to note that, while some might have good intentions with respect to communication, how they actually communicate sometimes thwarts those intentions [14].

If poor communication persists, conflict results. During a construction project, a trigger event often initiates a conflict and is typically the result of different issues, perspectives, understanding, beliefs, values, goals, or opinions. Figure 4 is a model of construction conflict development; it captures what happens following a trigger event. Parties will discuss their perspectives and ultimately decide to either defend their positions or explore their differences. If a stakeholder insists on sticking to their position, tension often results, which can lead to a fractured relationship. Conversely, if stakeholders explore their differences, relationships are often maintained at a high level, differences are worked through, and successful conflict management is the result [4].

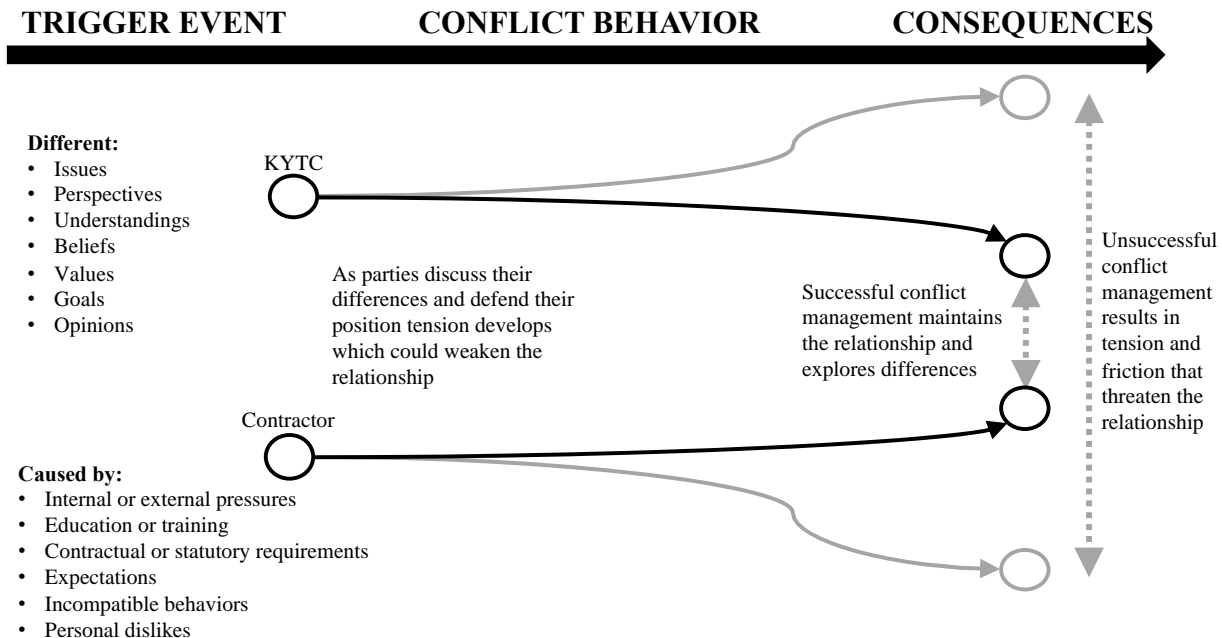


Figure 4 Model of Conflict Development. Adapted from Emmitt and Gorse, 2003 [4].

2.2 Effective Communication Practices at Departments of Transportation

To evaluate the communication practices at DOTs across the country, we reviewed agency guidance on communication. Construction manuals, project management handbooks, and field communication handbooks from all DOTs were examined to understand current and best practices. Based on our review and analysis, we placed each DOT into one of four categories:

- Has a standalone communication handbook,
- Communication tools listed in the project management or construction manual,
- Communication mentioned but without any significant guidance, or
- No mention of communication in any manual (see results in Figure 5).

California is one agency that has a standalone communication handbook. The California DOT (Caltrans) *Project Communication Handbook* serves as a guide for effective communication throughout the life of a project. It is designed to assist a project team prepare a plan to improve communication among all stakeholders [15]. The handbook also discusses the use of communication tools such as work breakdown structures, project charters, and filing systems. It outlines a system that project teams can follow in conflict situations [15].

Twelve (12) out of the 50 DOTs list some communication tools in project management handbooks or the construction manuals. All 12 of these documents contain thorough sections on preconstruction meetings. Some also present additional communication tools. For example, the Florida DOT has developed an eight-page section dedicated to communication that provides tips for improving communication on the phone, in meetings, and in writing. It also offers tips for effective listening. The Nebraska DOT's *Project Management Reference Guide* offers advice on internal and external communications. Best practices and examples are also provided [16]. The South Carolina DOT's *Construction Manual* emphasizes partnering as a strategy to improve

project efficiency. The manual contains several tools, such as an agenda for the initial and follow-up workshops, and a detailed section on team charters [17].

Thirty (30) DOTs mention communication in their manuals but do not furnish substantive guidance. The states in this category provide generic guidelines for preconstruction meetings and touch on communication, but the analysis and recommendations are not much deeper than this. Finally, seven DOTs do not mention communication in their construction manuals or handbooks. Our findings are surprising given that ineffective communication has routinely been identified as key contributor to poor performance in the construction industry [18]. Each state will have to move toward issuing a separate communication handbook, similar to that of Caltrans, to improve construction efficiency and performance.

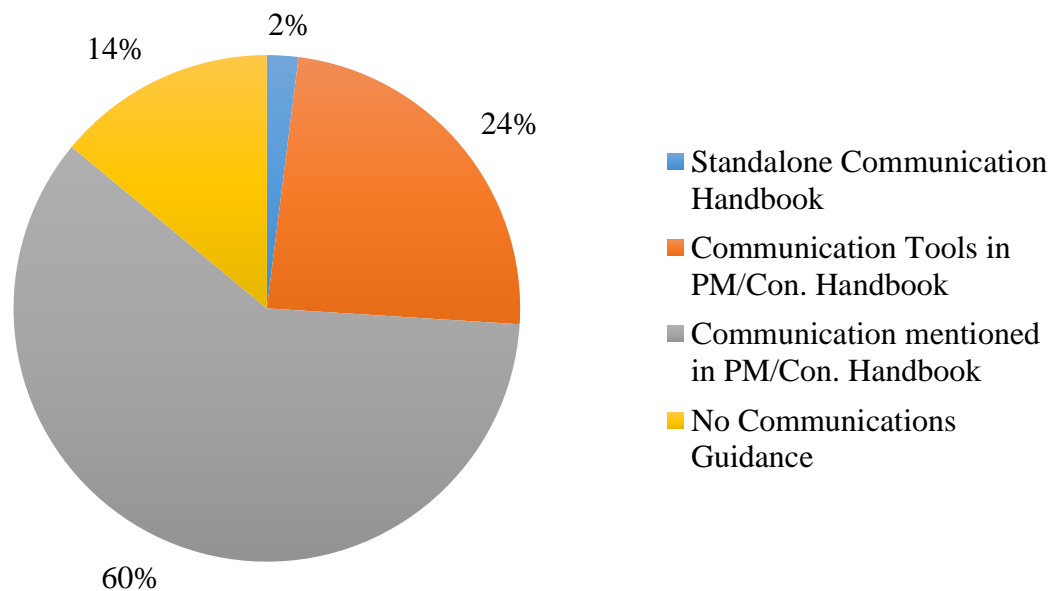


Figure 5 Categorization of Communication Guidance in DOT Manuals

2.3 Effective Communication Practices in the Private Sector

Compared to the highway construction industry, the private sector has been more open to providing methods for improving communication. Almost all of the research that has been conducted on effective communication in the private industry has focused on industrial and residential construction. Nonetheless, the highway industry can fruitfully adopt practices from other fields to improve its communication networks.

One research study on the Australian construction industry found that alliance contracting effectively facilitates communication between parties [14]. Since alliance contracting creates a single project delivery team instead of individual parties that might have conflicting interests, projects tend to run smoother than traditional contracts [14]. Some states have begun promoting alliance contracting. The Federal Highway Administration (FHWA) is also taking steps to promote

innovative contracting methods and tools that encourage collaboration in the highway construction industry. FHWA's Every Day Counts 4 promoted several methods to establish relationships built on mutual trust, achieve equally beneficial goals, foster open communication, and institute a commitment to resolving issues and minimizing disputes [19]. If implemented correctly, these methods can bolster communication and hopefully project performance in the highway industry.

Weekly construction meetings are used to exchange information and monitor project progress. Frequent meetings between stakeholders can help resolve problems and disputes [20]. Such meetings are more common in the industrial and residential construction sectors than in the highway industry. Weekly meetings can forge open communication between management departments and field supervisors, which interactions are often hampered by poor communication. Typically, management teams are busy handling multiple projects at the same time, whereas field supervisors are focused on ensuring their projects stay on schedule, creating a gap in communication. The severity of this problem is exacerbated by recent graduates on engineering administration teams being less knowledgeable about the crafts and issues of the field [21]. Weekly cost and schedule meetings for labor supervisors provide a channel for both management and field supervisors to exchange information and notify all stakeholders of any problems that have been recorded or which are foreseen [21]. Having weekly meetings in the highway industry can help improve communication and reduce tensions which arise in the field between various stakeholders.

3. Project Stakeholder Interviews and Experience Assessment

To better understand KYTC's field administration practices on construction projects, we interviewed highway contractors, district construction personnel, and consultant inspectors from across Kentucky. These interviews were semi-structured where a series of defined questions reviewed by the Study Advisory Committee (SAC) guided the conversations. Questions were purposely open-ended to encourage more discussion and ensure the topics covered were those the interviewees considered most important. We posed the same questions to all interviewees:

- Tell us about a past project (>\$10M) that you considered successful.
 - What factors do you feel enabled this project to be successful?
 - What processes did the contractor include that contributed to the project success?
 - What processes did you as owner representative include that contributed to the project success?
 - Describe how communication between all stakeholders was ensured.
- Tell us about a past project (>\$10M) that you considered NOT successful.
 - What factors do you feel caused this project to not be considered successful?
 - What did the contractor do/not do that contributed to the lack of project success?
 - What did you do/not do that contributed to the lack of project success?
 - Describe the communication between stakeholders.
- What administrative and communication processes are critical to a successful construction project? (and vice-versa)
- What areas do contractors need to improve to ensure a successful construction project? (Particularly in communication and working relationship with KYTC)
- What areas does KYTC need to improve to ensure a successful construction project? (Particularly in communication and working relationship with contractor)
- Is there anything else you would like to add that we haven't discussed?

We continued interviewing stakeholders until distinct themes emerged and the responses became saturated. In total, we interviewed four contractors and four owner representatives (KYTC construction inspectors). We reviewed interview responses and synthesized answers, paying special attention to questions where multiple interviewees provided similar responses. A brief summary of the responses for each interview question, along with high-level conclusions, is provided in the following sections.

3.1 Successful Project

All parties agreed the following elements are critical to developing a successful project: regular project meetings, project-level decision-making authority, and the willingness of both the contractor and KYTC inspectors to take ownership of a project. Table 1 summarizes responses to this question.

Table 1 Factors Contributing to a Successful Project
Factors That Contribute to a Successful Project

Contractor Responses	KYTC (Owner) Responses
Inspectors empowered to make decisions Available & willing to discuss issues Regular progress meetings Decision makers participate in progress meetings/discussions Willingness to tackle "difficult" issues Agreement/notification before escalating an issue. No surprises!	Inspector takes ownership of project Regular interaction and accountability Regular progress meetings with notes Central Office availability and prompt responses to inquiries. Frequent "Tailgate Meetings" on the project site Once a decision is made (good or bad) move on with project. Contractor takes pride in work and KYTC acknowledges their right to a reasonable profit Constant communication between Owner & Contractor's project level decision makers

3.2 Unsuccessful Project

All interviewees cited lack of authority or willingness to make decisions at the project and/or district level, as well as a lack of consistent communication between parties, as major roadblocks to a project’s success. Contractors noted several other factors can hamper project success: long review times for submittals, change orders, and project closeout documentation. Table 2 summarizes responses to this question.

Table 2 Factors Contributing to an Unsuccessful Project
Factors That Contribute to an Unsuccessful Project

Contractor Responses	KYTC (Owner) Responses
Distributing Claim Form at Precon Meeting "Boiler-Plate" Format of Precon Meeting Awarded over EE estimate. Difficulty for KYTC to understand why bid was higher. MOT plans that are not safe. Difficult to get revised and slow response time. Relationship issues when decisions are "over-ruled" by District or Central Office No defined or accepted issue escalation procedure Slow approval of Shop Drawings and falsework design No willingness by KYTC to accept fault for mistakes Ask contractor to "cut corners" on certain work items. Striping is a good example. Work performed by KYTC Maintenance not communicated to contractor Inefficiency still existing from the 2008 Re-Org Adjacent projects in different districts. adds a "layer" of bureaucracy Let change orders "sit" for too long before processing. Material certification Perceived double standard on meeting deadlines between Contractor and KYTC. Holding change orders until a deduction to reduce net amount. Change Orders perceived as attempts to "make more money" by KYTC Lack of authority, willingness, and/or expertise to make decisions in field. No ownership of projects by Section Engineers "Moving" money among quantities to avoid a change order. Deadlines for project documentation & closeout. RECOMMENDATION: Send periodic list of all open projects to Primes for review	KYTC assumed Contractor is trying to "make-up" for a previous job where they lost money No decision authority for Section Engineer. TEBM made all decisions No communication with Contractor workforce. Numerous personnel changes during the life of project. Excessive personnel turnover. Lack of experience. Bad relationship with certain contractors based on previous experience.

3.3 Critical Administrative and Communication Processes

Our question about the administrative and communication processes needed to ensure the success of a construction project generated numerous and varied responses from both contractors and KYTC. Major points emphasized in response to the first two questions reemerged in the context of this question. Interviewees commented that regular project meetings, project-level decision making authority, and ownership of a project by all parties are critical to project success. Interviewees also suggested tools to improve project administration and communication. Several of these ideas are quick wins and could be implemented right away while others require a change in culture, stretching their implementation over a longer time period. Table 3 summarizes responses to this question.

Table 3 Administrative and Communication Practices Critical to a Successful Project

Administrative & Communication Practices That are Critical to a Successful Project

Contractor Responses	KYTC (Owner) Responses
<p>Need to take ownership of a problem and not focus on people involved. Inspectors with maintenance background don't get involved unless a maintenance issue. Document all communication for later reference. Maintain a list of "action items" and responsible party(s). Call before sending a dispute letter. No surprises. Mutual respect. Know when to and how escalate issues. Too much time and energy spent on trivial issues. Lack of subject matter expertise at the Central Office level. Too much use of email. Easy to misinterpret the "tone" of the discussion. Meet face-to-face on scheduling and project issues. This encourages accountability & transparency. Both sides must take ownership in project schedules. Don't cry "wolf" over every issue. Contractor needs to present realistic schedule and KYTC needs to respect the submitted schedule. Better documentation and sharing of pre-construction meeting minutes. Understand the "decision hierarchy" of the contractor. Example, some allow field decisions by project Superintendent others don't. Subcontractors need to be involved in pre-construction conference. KYTC inspectors should not manage contractor personnel. Direct issues to foreman. Inspect work and measure/accept for payment but allow contractor to control the work. Means and methods. Regularly scheduled progress meetings. Frequency should be project specific. If resources for KYTC are an issue, request the Contractor to handle. Notes must be kept and distributed. Accountability for what is said and what needs to be done. Section Engineers need more office support. Need to emphasize the principles of informal partnering. District Office and Central Office need to back up decisions made in the field when possible. Put "response needed by" dates on all decisions. Biggest complaint was delay went decisions go to Frankfort. Appears there is often an "attitude of resentment" from KYTC that the contractors are making too much money. Especially when bid is higher than estimate. Acceptable profit for Contractor is not only acceptable it should be expected. Assuming quality of work merits profit. Allow contractor to improve rideability at their own cost. KYTC has denied on the past. Public would benefit from a higher quality ride. Inspectors should interact with contractor and avoid "sitting in the truck". Pre-approve pay estimates prior to processing to avoid needless delays. Allow contractor to review prior to submitting. If there are issues with pay estimate advise contractor ASAP. Notify Prime if a sub has not submitted certified payrolls. DBE documentation is very burdensome on contractor. Agreed pay schedule for lump sum items is important. Current format of Preconstruction Conference is not conducive to "informal partnering philosophies". It has become a "check the box" meeting.</p>	<p>Explain common goals to new employees. RECOMMENDATION: Provide handouts such as Collaborative Goals of the Project, Expected Outcomes, & Why Are These Good? Leadership needs to show respect to inspectors. It is human nature to not treat the contractors with more respect than you receive. "After Meeting" at Pre-Construction Conference is very productive. Regular project meetings. Section Engineer MUST visit and be updated on each project at least weekly. Section Engineer should not contradict inspector in front of others if possible. Also, don't show up after extended absence from job and proceed to relate all that is wrong with project. This just makes the inspector look bad and ticks off the Contractor. Develop generic agenda for regular project meetings that can be modified on a project specific basis. Realize that each district is different. There is no "one size fits all". Specifications excluded! Realize it take time to develop new inspectors and provide guidance from past</p>

3.4 Areas for Contractor and KYTC Improvement

The next two questions asked the interviewees to discuss areas in which both KYTC and contractors can improve. During the interviews we emphasized that it was important for interviewees to offer honest and unfiltered responses, but we also stressed that overly critical responses would be counterproductive. Areas in which contractors and KYTC agreed there could be improvement included having both parties understand the partnering philosophy, maintaining consistent communication, recognizing the appropriate chain of command, and the overall experience. Many of these areas can be addressed through formal training for contractors and KYTC. However, the larger issues, such as taking ownership of the project and staff inexperience can only be improved over time with support from Cabinet leadership. Tables 4 and 5 summarize the responses of contractors and KYTC staff, respectively.

Table 4 Areas of Improvement for Contractors
Areas Contractors Need to Improve to Help Ensure a Successful Project

Contractor Responses	KYTC (Owner) Responses
Need to view KYTC as their best customer. Focus on customer service. Have respect for KYTC and issues they must handle. Improve Partnering ideology. Staying on top of submittals. KYTC is understaffed. Request reasonable response times. Don't "cry wolf" and act like every issue is an emergency. Improve communication skills. Both in person and electronically. Follow up verbal discussions with a quick "as-discussed" email. Contractors need to stay ahead of potential issues and notify KYTC early of potential problems. Don't sit back and wait for a decision and documentation. Be more proactive in obtaining replies.	Recognize that as the owner representative, KYTC needs to "control the message". Realize that KYTC is INEXPERIENCED not INCOMPETENT. Doing so can prejudice a young inspectors perspective of contractors forever. Make two phone calls and a non-threatening email before escalating issue. Contractors must realize that they have lost a lot of experience as well. Not just KYTC. Need to continue to develop field personnel so decisions can be made at the project level. Communicating to KYTC their planned work schedule. Avoid last minute notice of beginning work, moving to a new location, or working weekends, etc.

Table 5 Areas of Improvement for KYTC
Areas KYTC Needs to Improve to Help Ensure a Successful Project

Contractor Responses	KYTC (Owner) Responses
<p>Reduce the "cultural" differences between districts. This impacts inspector attitudes toward contractors. It is not uncommon for bids to be increased simply because of historically bad relationships with certain districts.</p> <p>Indecision between Section Engineer and Liaison. Learning from a bad decision is better than constant indecision. If needed, say "no" and escalate. But accept if it changes to "yes".</p> <p>Funding issues at KYTC always causes perspective of contractors to deteriorate. When at all possible require Central Office Liaisons to have experience as a Section Engineer.</p> <p>Section Engineer should refrain from telling contractor personnel what they should be doing. Direct comments to foreman.</p> <p>Lack of experience is a major issue through several layers of KYTC. It appears to have worsened since the ReOrg in 2008. Small issues seem to elevate up the chain instead of being resolved at a lower level.</p> <p>Lack of trust between KYTC and Contractor and also between different levels at KYTC. Requests made at pre-construction conference are often never carried out.</p> <p>Delay in responses from KYTC management hurts the motivation of field personnel.</p> <p>Take pride and ownership of each project.</p> <p>Stay on top of submittals and where they are in the process.</p> <p>Requiring justification for additional quantities/money for obvious plan errors.</p> <p>Leadership should accept that field personnel will make mistakes and use them as learning tools and not "gotcha" moments.</p>	<p>Reinforce to inspectors their job is not to save money. It is to get the best product for the money that is being spent. For example, make sure to get the best product for \$100 and not try to spend only \$90 on a \$100 budget.</p> <p>KYTC needs to emphasize that applicable years of experience and total years of experience are not the same thing. Everyone is NOT interchangeable. This sends a confusing message to inspectors.</p> <p>Ensure that field positions are backfilled as quickly as KYTC management positions. Doing otherwise sends the wrong message.</p> <p>KYTC management should reinforce to field personnel that they are there to support and not act as a "watch dog". If not, inspectors become reluctant to make decisions.</p> <p>Revolving door for field personnel is an issue. Consider allowing EITs to forgo the rotation if they want to stay.</p> <p>Continue to work on ways to improve recruitment and retention of Technicians. They are vital.</p> <p>Stop holding change orders waiting for additional work items.</p>

3.5 Additional Observations

The final interview question presented interviewees with the opportunity to add anything they felt would be helpful which had not been previously discussed. The responses mostly reinforced previously discussed ideas and issues. The need for consistent communication, mutual respect, timely review of submittals, and overall lack of experience again were deemed critical factors. Table 6 summarizes the responses for this question.

Table 6 Additional Items of Note from Interviews
Additional Items Not Previously Discussed

Contractor Responses	KYTC (Owner) Responses
<p>Without mutual respect it is tough to have a successful project. Put yourselves in the other person's shoes. Personal attacks always end bad.</p> <p>Factors that impact respect: KYTC culture, Age & Experience, Organizational Change, Organizational Policy (improving), Authority & Responsibility (not enough in field), and Communication (too much email not enough face-to-face).</p> <p>Don't leave on Friday mad at each other or with outstanding issues.</p> <p>Even with verbal approval for change order to allow work to proceed, documentation still needs to happen promptly for payment.</p> <p>Materials is an issue. An apparent lack of understanding how much their work impacts the progress of the project.</p> <p>Timeliness of testing samples. Examples of samples taken and left in back of truck for days. Quality will naturally deteriorate and effect results.</p> <p>Difference in interpretation of specifications across districts is an issue.</p> <p>Experience is defined generically. For example, someone may be a 20 yr employee but that experience may not be relevant.</p> <p>Understanding of what needs to be reviewed in a submittal needs to be improved. A good example is shop drawings. Are they being reviewed or just received. There is a big difference.</p>	<p>With the new HT series, we need to ensure we have the appropriate experience inspecting road construction.</p> <p>Need to understand that quality may cost more up front, but will last longer and usually end up cheaper in the long run.</p> <p>If current trend continues, consultants will be inspecting the majority of road construction. Will the consultant industry less likely to argue with contractors for fear of losing future work?</p> <p>Need to learn to pick your battles. Don't have to win and/or be right every time. KYTC & Contractors are partners. Contractors want to make money and KYTC wants good projects at reasonable costs. Must work together to make that happen.</p> <p>ProjectWise could be made more "user-friendly".</p> <p>It's ok to make a mistake. But not ok to not make a decision.</p>

3.6 KYTC Experience Assessment

As the responses demonstrate, interviewees brought up staff inexperience multiple times and attributed many of the challenges that materialize during project administration to a lack of experience. Accordingly, we felt it would be informative a look at the average years of experience for various KYTC engineering levels over the last several years to identify trends. To do this, we took snapshots of the Cabinet engineering experience in 2007, 2012, and 2019. Engineering staff were categorized into the following groups: Staff Level; Advisory Level; Management Level; and Executive Level. Figure 6 presents the results of this analysis.

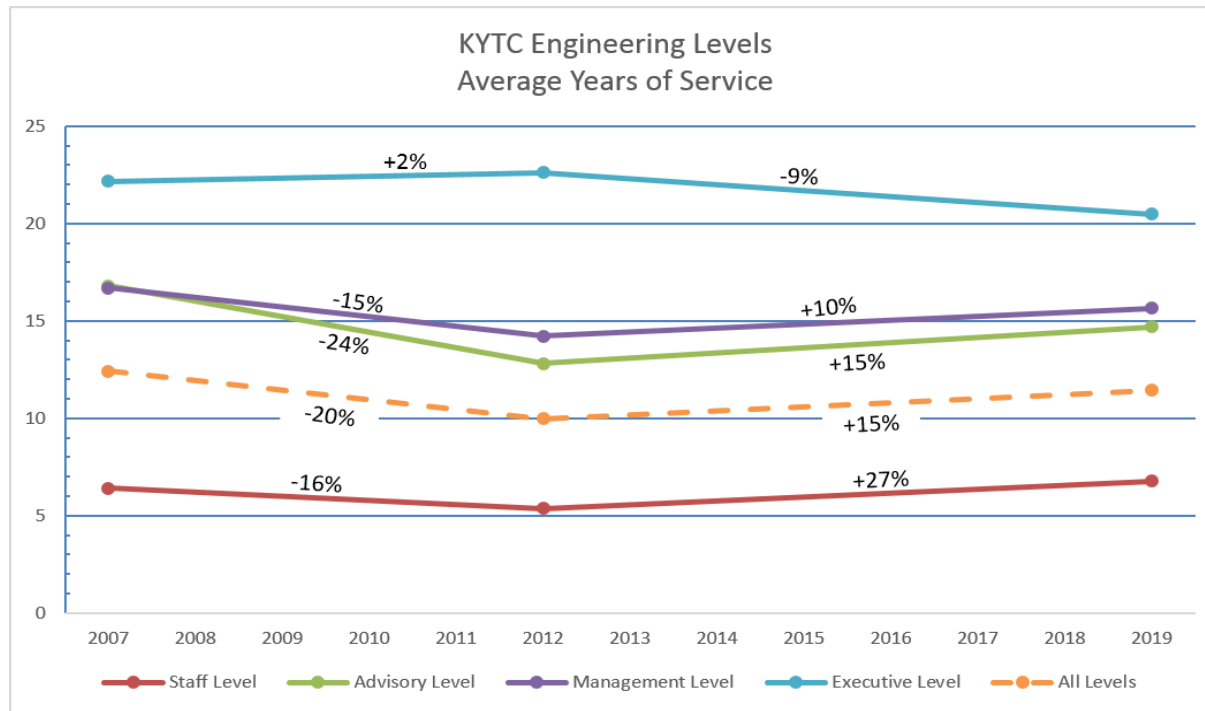


Figure 6 KYTC Engineering Staff Average Levels of Service, 2007-2019

From 2007 to 2012, the average years of experience across all groups declined by 20%. The only anomaly during this period was at the executive level, which saw an increase of 2%. Reductions at the other levels most likely resulted from an attractive retirement window at the end of 2007 as well as attrition resulting from mid-level engineers leaving the Cabinet for higher salaries in the private sector. Recognizing this trend, KYTC leadership instituted a salary increase for all merit engineering positions in 2014. The positive effects of this action are reflected in the average years of experience across all groups increasing 15% from 2012 to 2019. Trends at the executive level were again anomalous, as average years of experience fell 9%. While it cannot be the entire solution to maintaining experience and core competencies at KYTC, increasing salaries to retain employees appears to have a positive impact. Readers should note that this figure indicates overall experience for all engineering disciplines. Perhaps a more accurate measurement would be the relevant engineering experience for each discipline area, however, this was beyond the scope of the current project.

3.8 Summary and Recommendations

Based on our analysis of interview responses, we synthesized commonalities and trends. We identified five major issues common to KYTC construction projects and presented corresponding recommendations for future improvement. The top issues and corresponding recommendations are presented in Figure 7.



Figure 7 Top Five Issues and Recommendations

Projects not administered using the partnering philosophy commonly suffer from the first three issues captured in Figure 7. While there is no individual solution that will resolve all of these issues, all projects should have regularly scheduled update meetings, a documented and well-understood issue escalation procedure, and receive buy-in from all parties around a common set of project goals. For most projects — especially smaller ones — a brief discussion following the Preconstruction Conference will suffice to accomplish these goals. The frequency of update meetings should be project-specific decision made by the Section Engineer and Contractor Field

Superintendent. A generic template for an escalation ladder can be developed for smaller projects and modified in response to the specifics of each project. For larger or more complex projects, these processes may need to be more formal; an additional meeting before the project begins may also be necessary.

The final two issues speak the lack of relevant construction experience among staff and the absence of an organizing management philosophy. Formal training and mentoring hold the most promise for addressing these challenges. At a minimum, these issues can be discussed and highlighted during Section Engineer Meetings, TEBM Meetings, and annual district training. Management support and emphasis on these issues is critical for achieving buy-in at the project level.

We recommend a two-phase approach to resolve with these issues. First, formal training should be developed that includes tools to ameliorate each of the five issues presented. The training could be a standalone event or included as a module in the Construction Management Academy. Second, we recommend the development of a leadership-supported initiative that encourages the administration of construction projects be oriented around a philosophy that emphasizes common project goals, fosters communication, and empowers field personnel to make decisions at the project level. Both recommendations are salient regardless of whether a project is inspected entirely by KYTC forces, supplemented by contract employees, or by consultants. The next chapter presents an outline of a recommended training module and a plan for implementing the Putting the Project First initiative.

4. Putting the Project First

4.1 Introduction

Our findings revealed that the emphasis placed on field communication skills has declined over time at KYTC, mainly due to inadequate staffing levels. Currently, both internal and external project stakeholders commonly experience dissatisfaction and frustration. Based on our interviews with internal and external project stakeholders, we have devised an approach to improve project communication. Our programmatic solution blends concepts from risk management, organizational behavior and management (i.e., soft skills), and partnering. Dubbed the *Putting the Project First* (PPF) initiative, the objective of this program is to develop tools, practices, guidance, and training to meet stakeholder needs across all project types. Some agencies, such as the Colorado DOT, use some of these approaches as a segment of their formalized partnering process to limit project conflict and establish tools to resolve conflicts and improve communication.¹ Other concepts included within PPF are more general to management and best practices for negotiation.

While the use of formal partnering has waned at KYTC, partnering concepts and practices can nevertheless benefit the construction management process. Collecting and organizing these elements is a primary impetus of PPF. Although the scope of our current research does not allow for the full development and implementation of PPF, we have developed of an implementation-ready contextual framework KYTC can leverage. The following sections discuss the context in which PPF will be implemented at the Cabinet. Successful implementation will require buy-in from stakeholders. Therefore, we present our approach as a series of recommendations. Once enacted, the recommendations will establish a foundation for developing the full PPF program.

4.2 Putting the Project First Scope and Overview

The PPF concept can be adapted and scaled to all KYTC project types and is applicable for various stakeholders. To accomplish this, the project types, stakeholders, tools, and areas for emphasis need to be identified. The following descriptions (Table 7) are starting points for development and adaptation because buy-in is imperative to the success of PPF. We present a strategy to achieve buy-in later in this chapter.

¹ See <https://www.codot.gov/business/designsupport/design-docs/project-first-on-construction-projects>

Table 7 Putting the Project First Overview

Putting the Project First Overview	
Project Types	Small Project:
	Medium Project:
	Large/Complex Project:
Stakeholder Guidance	KYTC & Contractor
	Staff Level
	Advisory Level
	Management Level
	Executive Level
Tools, Practices, Guidance and/or Policy	Reboot of the Construction Management Academy
	Issue Documentation Matrix
	Issue Escalation Ladder
	Section Engineer Cheat Sheet
	Best Practices for Subject-Matter Experts: <ul style="list-style-type: none"> Guidance for those providing technical and managerial support
	Electronic Toolbox and Best Practices Guide: <ul style="list-style-type: none"> Examples of tools — Templates for Issue Documentation Matrix, Issue Escalation Ladder, form letters to contractors Examples of Best Practices — Communication Response Guide
Areas of Emphasis	Establish Project Goals and Objectives: <ul style="list-style-type: none"> Meeting Frequency Revisions to Preconstruction to deal with all of these bullets Section Engineer Field Visit Frequency Schedule and Progress Meetings Relationships, Respect, and Understanding
	Escalation and Empowerment: <ul style="list-style-type: none"> Field decisions guidance Issue Escalation Ladder and guidance
	Communication and Documentation: <ul style="list-style-type: none"> Meeting documentation with action items and due dates Issue Documentation Matrix Communication guidance (form and format)
	Effective Management and Providing Subject-Matter Expertise: <ul style="list-style-type: none"> Section Engineer Orientation How to effectively provide subject-matter expert support Rebrand partnering philosophies (i.e., PPF)

4.3 An Approach to Buy-In for Putting the Project First

Administering the introduction of programmatic changes can be difficult; staff expecting to feel the brunt of the changes may voice resistance. In the past, KYTC has implemented programmatic change with varying levels of success. Current and future recommended changes accompanying PPF are significant enough to consider them programmatic. As such, changes must be implemented with care. Guidance for implementing substantial change is offered from two sources. First, the Kaizen Institute has described six steps to achieve effective change²:

1. Mobilize commitment to change through the joint diagnosis of business problems.
2. Develop a shared vision of how to organize and manage for competitiveness.
3. Foster consensus for the new vision, competence to enact it, and cohesion to move it along.
4. Spread revitalization to all departments without pushing it from the top.
5. Institutionalize revitalization through formal policies, systems, and structures.
6. Monitor and adjust strategies in response to problems in the revitalization process.

Key points that merit highlighting include the need to jointly diagnose problems and the importance of reaching consensus when formulating solutions. The interviewees we spoke with (see Chapter 3). An article from the *Harvard Business Review* also contained four useful practices for implementing changes³:

1. Tell it like it is.
2. Break the initiative down into manageable chunks.
3. Hear employees out.
4. Reverse the flow.

Building off of these suggestions, we used information collected during our stakeholder interviews to break recommendations into manageable phases. We developed an informational brochure that summarizes the first batch of recommendations associated with PPF. Appendix A contains a copy of this brochure. We anticipate presenting and distributing the brochure at KYTC Section Engineer's meetings and to the Kentucky contractor and consultant communities to solicit feedback. Based on their comments we intend to and revise the recommendations.

The process of implementing suggested changes will give those impacted by the changes an opportunity to provide their input and therefore attain some a level of buy-in into PPF. While the recommendations seem KYTC-centric, their goal is to improve relationships between the contracting community and the Cabinet. The principles outlined below apply to all inspection and field staff, including KYTC employees, consultant inspectors, and fully consulted construction engineering and inspection. The following sections elaborate on recommendations put forward in the PPF brochure according to their respective phase of implementation. Currently we envision this being a three-phase process (recommendations that can be implemented over the short-, medium-, and long-term). Once the brochure is distributed and feedback is received these recommendations may be altered, amended, or discarded.

² <https://in.kaizen.com/blog/post/2016/07/05/six-steps-to-effective-change.html>

³ <https://hbr.org/2008/02/how-to-win-the-buyin-setting-t-1>

4.4 Short-Term Recommendations (Phase 1)

Recommendations that can be implemented in relatively short order include adopting useful tools and guidance that will carry through additional phases of the program. These recommendations are presented sequentially, in the order their implementation should be prioritized. Most of the recommendations for PPF are conceptual and nature and were developed following numerous discussions with KYTC project stakeholders.

4.4.1 Establishment of a Putting the Project First Taskforce

The first recommendation is to establish a PPF Taskforce consisting of Cabinet personnel at various levels (staff, advisory, management, and executive) and potentially representatives from other stakeholder groups (researchers, contractors, consultants). The taskforce would serve as the governing body of the PPF initiative. Its mission will be to improve field-level communications and relationships between stakeholders. Principal activities will include selecting and implementing components of PPF, working to ensure PPF is an initiative that continually improves by evaluating recommendations and making adjustments based on feedback, and rolling out new tools and guidance as needed. One potential approach to evaluating PPF at the project level is to include an evaluation tool or question in the post-construction review process or contractor and KYTC evaluation process. Although we (the KTC research team) would like to remain involved with this taskforce, especially in its early stages, Cabinet personnel at the management level should lead the taskforce's efforts. As the primary decision-making body for PPF, the group will be a key source of information on the initiative. Much of the knowledge related to PPF will be disseminated via training, specifically through a revised Construction Management Academy.

4.4.2 Revised Construction Management Academy (CMA)

The CMA will be revised through development of a module on project communication and administration for Section Engineers. Under this scenario, the current CMA agenda will undergo restructuring so that elements related to effective communication and administration are grouped into single module. This module will likely add one day to the CMA. Additionally, consideration should be given to posting content online so stakeholders can refresh their knowledge (e.g., slides, notes, videos). Appendix B includes a recommended outline for the revised CMA.

As noted, we recommend developing training on field communication and the administration of construction projects. The audience for this training is Section Engineers, project inspectors, and consultant inspectors. It can be developed as a standalone course or included as a module in the CMA. Taking into account the scope of this project and information gathered during interviews, we propose the following outline for the training:

- I. Conducting an Effective Preconstruction Conference
- II. Project Update Meetings
- III. Development and Implementation of an Issue Resolution Ladder
- IV. Establishing Project Goals
- V. Managing Projects to Achieve Best Value

After completing the course, participants should be able to:

- Plan and conduct an effective Preconstruction Conference,

- Organize project-specific update meetings with appropriate attendees, for which accurate records are kept,
- Understand and respect the lines of communication specific to each project and know when and how to escalate issues,
- Determine common project goals and recognize the importance of receiving buy-in from all project team members, and
- Differentiate lowest cost from best value and make project level decisions accordingly.

We recommend that the training last approximately six hours if it is a standalone course. This will allow sufficient travel time for participants. If included in the CMA, during instructional activities, staff in leadership positions could be on hand to provide comments that draw on their personal experiences. If the training is developed by contract, we recommend that KYTC guide and direct content development and provide a strong in-house presence during implementation.

4.4.3 Issue Escalation and Tracking Tools

One challenge mentioned by most of the interviewees is that project issues and questions tend to be drawn out over an extended period. The perception among these stakeholders was that decisions are avoided, or staff lack the experience necessary to make decisions. Other potential contributors are resource shortages and a lack of focus on prioritization. Reviewing approaches used by other states, we identified two useful tools that should be considered for immediate implementation: the Issue Escalation Ladder and Issue Documentation Matrix.

The Issue Escalation Ladder furnishes an approach to resolving project questions or problems, one that is mutually agreed to by KYTC and its contractors. In construction, time is a critical factor and when questions or issues are not resolved quickly there are associated costs. The Issue Escalation Ladder presents a define timeline and procedure for settling common questions or problems. If a problem arises, a fixed amount of time is set to attain a resolution at a personnel level. If it is not solved within the specified time period, the problem is automatically escalated to the next level for consideration. Use of this tool promotes timely decisions and prevents small, festering issues from becoming larger, more cumbersome ones. This approach is not an alternative to nor a tool to be used with the claims process. Appendix C includes an example template for the Issue Escalation Ladder. The template's timelines and levels should be amended for individual projects. Project stakeholders should agree to the structure of the Issue Escalation Ladder at the Preconstruction Conference or beginning of a project.

In conjunction with an Issue Escalation Ladder, issues and questions must be documented as they emerge on a project. The daily work report has been the primary documentation for this purpose. However, because these reports are not typically available contractors in real-time, concern and uncertainty can crop up about issues and whether stakeholders are working toward resolution. For example, where KYTC is looking for issue resolution, there can be similar instances where the Cabinet is not provided with documentary evidence of an issue being resolved. The Issue Documentation Matrix is a project specific-form that serves as a record of communication between KYTC and a contractor; it furnishes evidence that either an issue is moving toward a resolution or that progress toward a resolution has stalled and therefore the issue potentially requires advancement on the Issue Escalation Ladder. Appendix D contains a template for an Issue

Documentation Matrix. The form provides drop-down menus to facilitate data entry; it can be easily modified to fit a project's needs.

4.5 Intermediate Recommendations (Phase 2)

While the short-term recommendations will establish a foundation for the PPF program, the intermediate recommendations represent a second phase of the PPF initiative and likely will be adapted pursuant to stakeholder feedback and taskforce modifications. Broad outlines of the intermediate-term recommendations are sketched in this section.

4.5.1 Putting the Project First Scalability Matrix

Not all construction projects should be treated in the same manner. Using an administrative framework that has been adapted to an individual project's context is a more efficient use of resources. By developing a tool to scale PPF to a project type, KYTC can build efficiency into the administration of their projects. Appendix E contains an example Project Scalability Matrix sourced from the International Partnering Institute. The PPF Taskforce can work to customize a Cabinet-specific tool based on this example.

4.5.2 Revisions to the KYTC Preconstruction Checklist and Instructions

The application of the Preconstruction Checklist exemplifies the need for scalability. As originally designed, only elements in the KYTC Preconstruction Checklist needed for a project are to be used; and those portions are to be completed prior to the Preconstruction Conference to facilitate discussions related to plans, schedule, and project concerns. However, because the checklist was developed in a comprehensive form so it is applicable to even the most complex Cabinet projects, it often distracts from the Preconstruction Conference. Discussions about plans, project work, and project concerns often get sidelined as secondary topics when attention shifts to the Preconstruction Checklist, even though discussing these issues should in fact be the primary focus of the meeting. The PPF Taskforce should prioritize revising KYTC's Preconstruction Checklist based on a review of the comments collected during this study. The taskforce should also develop instructions and guidance for conducting a Preconstruction Conference and use of the Preconstruction Checklist. Potential revisions include setting frequencies for recurring meetings (if any) and modifying issue resolution forms previously discussed. Example guidance for using the Preconstruction Checklist is provided in Appendices F and G. The Kentucky Transportation Center is currently updating the KYTC Construction Guidance Manual and this information will be included.

4.5.3 Establishing a Putting the Project First Project Folder

A Putting the Project First Project Folder can aggregate information currently part of the Preconstruction Checklist, thereby making the Preconstruction Checklist a focal point on a project. This folder will collect project-specific contacts and forms (e.g., Issue Escalation Ladder) and serve as a hub for sharing communications and documentation between contractors and KYTC representatives. The folder could be hosted online any number of services and adopt a standard structure established by the PPF Taskforce. However, careful restrictions should be placed on what information can be placed in the folder — an information overload will diminish its usefulness. Examples of PPF Project Folder content include (these are all project specific/ adapted items):

- Contact list (see page one of the current Preconstruction Checklist)

- Issue Escalation Ladder
- Issue Documentation Matrix
- Subfolder for Scheduling Documents
- Subfolder for Meeting Minutes
- Communication Log

4.6 Long-Term Recommendations (Phase 3)

The long-term recommendations outlined in this section are described at a very conceptual level and may require significant development and refinement before they are implemented. When the PPF program reaches this stage of implementation, the recommendations presented here may no longer be valid. Nonetheless, they warrant consideration. As with all of our recommendations, the goal is to provide opportunities for collaboration, information sharing, and communication between KYTC project stakeholders.

4.6.1 Putting the Project First Portal

We recommend developing an online portal that will to serve as a communications hub for projects. Significant time will be required to conceptualize and develop this initiative. However, there are programs and platforms that KYTC currently uses which could inform development of a Putting the Project First Portal, such as the project information within DataMart. Revising this information could make it even more useful to a project team. Below are some examples of how a PPF Portal benefit project communication and information sharing.

Revisions to the Project Dashboard

KYTC posts project information on its DataMart online portal, which can be accessed by the public. Figure 8 illustrates a project dashboard and indicates there is an electronic database that houses project-specific information. Most of the information available on DataMart is principally of use to the public and media outlets. With minor additions (e.g., adding contact information or contractor contacts), the platform could be more useful to a project team. The PPF Taskforce should determine what information, including graphics (e.g., earnings curve or progress curve), might serve as powerful communication tools and benefit a project team.

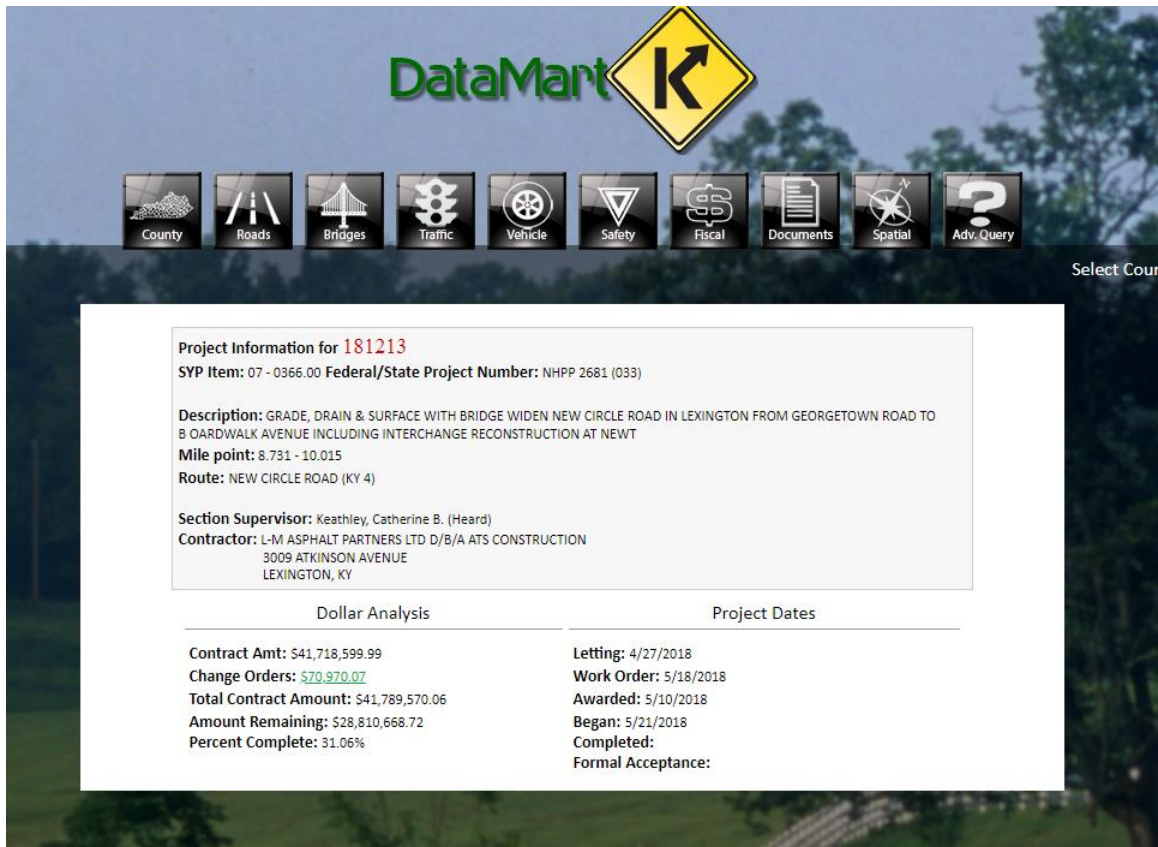


Figure 8 Example Project Dashboard

Data Entry Forms

If KYTC and the project contractor complete forms similar to page one of the Preconstruction Conference Checklist, this information could be uploaded to the PPF Portal. These forms will make available contact information, project dates, desired meeting frequencies, project concerns, and project milestones. This information could be compiled before the Preconstruction Conference. Once completed, the PPF Portal could generate project-specific tools (e.g., Issue Escalation Ladder, Meeting Schedule, Preconstruction Checklist) based on the information entered.

Putting the Project First Electronic Project Folder

Included among the Phase 2 recommendations is development of a PPF Project Folder to facilitate project communication and information exchange. Through data entry forms and an electronic Preconstruction Conference Checklist, a significant portion of the development of Project Folder information could be automated. As use of PPF Program elements is standardized, automating information and making it easily accessible electronically will increase the efficiency of field communication.

5. Conclusions

This project sought to understand and propose solutions to resolve issues that arise during field communications between contractors and KYTC personnel. Its primary objective was to provide guidance for managing staff levels, field communication, and facilitating supplemental agreements in an effective and fiscally responsible manner. To meet this primary objective, we addressed the following secondary objectives:

- Identify successful strategies for effective field administration of construction projects;
- Assess KYTC's current level expertise in field administration and determine future training and guidance needs;
- Outline and begin preliminary development of KYTC-specific training and guidance for effective field administration of construction projects; and
- Work with KYTC leadership to develop a succession plan to ensure field administration skills are maintained regardless of turnover or changes in personnel.

We collected data and conducted multiple interviews with KYTC personnel and contractors throughout the state. Based on our data collection and interviews, we presented the following findings in this report:

- The average experience (in years) of KYTC engineering staff waned significantly between 2007 and 2012 but is now slowly recovering.
- Field communication between KYTC and contractors is marred by indecision and the lack of consistent decision-making authority.
- Project performance is hampered by the lack of accountability and often adversarial relationship with the contractors.
- In response to our findings, we proposed the Putting the Project First (PPF) initiative. It focuses on establishing clear project expectations and empowering KYTC staff to become confident decision makers.
- We presented recommendations and an initial outline and anticipated contents of the PPF initiative.

As proposed here, the PPF initiative consists of short-term, intermediate-term, and long-term recommendations on the tools and processes that will need to be developed to move the Cabinet and its contractors toward more collaborative relationships defined by shared values and goals. Recommendations include the following themes with tools and guides:

Establish Project Goals and Objectives

- Meeting Frequency
- Revisions to Preconstruction to deal with all of these issues
- SE Field Visit Frequency
- Schedule and Progress Meetings
- Relationships, Respect, and Understanding

Escalation and Empowerment

- Field Decisions Guidance

- Issue Escalation Ladder and Guidance

Communication and Documentation

- Meeting Documentation with Action Items and Due Dates
- Issue Documentation Matrix
- Communication Guidance (Form and Format)

Effective Management and Providing Subject-Matter Expertise

- Section Engineer Orientation
- How To Effectively Provide SME Support
- Rebrand Partnering Philosophies (i.e., PPF)

6. References

- [1] Wynn, M. (2014). "Retirements create Ky. government skills gap." *Louisville Courier Journal*. June 9, 2014. Accessed June 10, 2019. <https://www.courier-journal.com/story/news/politics/2014/06/09/retirements-create-ky-government-skills-gap/10225835/>.
- [2] Eager, D.L., Roggenkamp, K.D., and Davis, C.A. (2018). "Comprehensive Annual Financial Report; 2018." Kentucky Retirement Systems. Accessed June 10, 2019. [https://kyret.ky.gov/Publications/Books/2018%20CAFR%20\(Comprehensive%20Annual%20Financial%20Report\).pdf](https://kyret.ky.gov/Publications/Books/2018%20CAFR%20(Comprehensive%20Annual%20Financial%20Report).pdf)
- [3] Cooper, R., Moss, P., Nelson-Williams, R., Kitt, G., and Recan, J. (2017). "Global Construction Disputes Report 2017: Avoiding the Same Pitfalls." Arcadis Contract Solutions. Accessed June 10, 2019. <https://bit.ly/2y4HXAP>.
- [4] Emmitt, S. and Gorse, C. (2003). "Construction Communication." Wiley-Blackwell Publishing, ISBN: 9781405100021.
- [5] Thomas, K.W. and Kilmann, R.H. (1975). "The social desirability variable in organizational research: an alternative explanation for reported findings." *Academy of Management Journal*, 18(4), 141-153.
- [6] Thomas, K.W. (1976). "Conflict and conflict management. In: M.D. Dunnette (ed.) *Handbook of Industrial and Organizational Psychology*. Rand McNally, Chicago, 889-935.
- [7] Rahim, M.A. (1983). "A measure of styles of handling interpersonal conflict." *Academy of Management Journal*, 26(2), 368-376.
- [8] Barrett DJ. Leadership communication. Boston: McGraw Hill Education; 2006
- [9] Awati, K. (n.d.). *Obstacles to Project Communication*. [Online] Project Smart. Available at: <https://www.projectsmart.co.uk/obstacles-to-project-communication.php> [Accessed 31 Aug. 2018].
- [10] A. Pérez Gómez-Ferrer, "Communication problems between actors in construction projects," thesis, Aalto University, 2017.
- [11] M. L. Djajalaksana, P. R. Zekavat, and S. Moon, "Effectiveness of on-site communication in residential housing projects," in *ISARC 2017 - Proceedings of the 34th International Symposium on Automation and Robotics in Construction*, 2017, pp. 1093-1098.
- [12] A. A. Talukhaba, T. Mutunga, and C. O. Miruka, "Indicators of effective communication models in remote projects," (in eng), *International journal of project organization & management : IJPOM*, Aufsatz in Zeitschriften, Article in journal vol. 3, no. 2, pp. 127-138, 2011.

- [13] B. G. Zulch, "Communication: The Foundation of Project Management," *Procedia Technology*, vol. 16, pp. 1000-1009, 2014/01/01/ 2014.
- [14] L. M. Sperling, M. B. Charles, R. A. Ryan, and K. A. Brown, "Driving Safety: Enhancing Communication Between Clients, Constructors and Designers," in *Proceedings Third International Conference of the Cooperative Research Centre (CRC) for Construction Innovation – Clients Driving Innovation: Benefiting from Innovation*, 2008.
- [15] Project Communication Handbook, California Department of Transportation, 2007. Accessed on: Aug. 27, 2018. [Online]. Available: http://www.dot.ca.gov/projmgmt/documents/PM_Communication_Handbook.pdf
- [16] *Project Management Reference Guide*, Nebraska Department of Transportation, 2017. Accessed on: Aug. 27, 2018. [Online]. Available: <https://dot.nebraska.gov/media/7346/pmbp-manual-2017.pdf>
- [17] *Construction Manual*, South Carolina Department of Transportation, May, 2004. Accessed on: Aug 27, 2018. [Online]. Available: <https://www.scdot.org/business/scdot-construction-manual.aspx>
- [18] A. Dainty, D. Moore, and M. Murray, *Communication in construction: theory and practice*. London: Taylor and Francis, 2006.
- [19] Federal Highway Administration, "e-Construction and Partnering: A Vision for the Future." U.S. Department of Transportation Federal Highway Administration, Sep-2016.

Appendix A Putting the Project First (PPF) Brochure

Field Communication Study

A recent study by the Kentucky Transportation Center conducted interviews with highway contractors, district construction personnel, and consultant inspectors from across the state of Kentucky. These interviews used a series of defined questions to discuss the current state of relationships and communication among KYTC project stakeholders. Five distinct needs emerged from the interviews.



KYTC Project Communication Needs:

1. Have for consistent and constructive communication between inspection crew and contractor
2. Have a well-defined decision-making "ladder"
3. Be accountable for success of project
4. Ask questions, be prepared, and bring experience to the project
5. Use a "program management" approach to administration of construction projects



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Safety
Teamwork
Success

Effective Field Communication by

Putting the Project First



Putting the Project First

The PPF program is intended to be broadly adaptable and scalable to all KYTC project types and applicable for various stakeholders. The KYTC and Contractor stakeholders at staff, management, advisory, and executive levels must make a point to put the project first by placing opinions, agendas, and feelings aside. The PPF areas of emphasis are:

- Project Goals & Objectives
- Escalation & Empowerment
- Communication & Documentation
- Effective Management & Subject Matter Expertise

Within these areas, some of the tools to assist in PPF include:

- PPF Taskforce
- Issue Documentation Matrix
- Issue Escalation Ladder
- Revised Construction Management Academy
- Best Practices for Subject Matter Experts
- Guidance for those providing technical & managerial support
- Electronic Toolbox and Best Practices Guide

PPF Taskforce

The taskforce will be compiled of KYTC members at the various levels (staff, advisory, management, and executive) and representatives from other stakeholder groups (researchers, contractors, consultants). This group is the governing body of the PPF initiative. Their mission is the improvement of field level communication and relationships. Their main tasks are the selection and implementation of components for PPF, ensuring PPF is a continuously improving initiative by evaluating recommendations and making adjustments accordingly through garnered feedback, and rolling out new tools and guidance as needed. The PPF Taskforce will disseminate information and provide training through a revised Construction Management Academy and other courses and materials.

Issue Resolution

In construction, time is money. Issues need to be resolved before they become claims. The Issue Escalation Ladder is intended to provide an agreed upon (between KYTC and contractor) approach to resolving project questions or problems in a timely manner. The Issue Escalation Ladder presents a defined timeline with which "common" questions or problems are to be resolved. Once the time for resolution expires at one level, it automatically moves to the next level for consideration. The use of the tool promotes timely decisions

and decreases the festering of small issues becoming larger ones.

The Issue Documentation Matrix provides a project specific form that serves as evidence and tracking for communication between KYTC and their contractor to ensure issues are working toward resolution or if they are not being progressed, shows the need for them to be elevated on the Issue Escalation Ladder.

Your Feedback is Needed

Putting the Project First is a KYTC initiative advocating teamwork and partnership among all project stakeholders. The development and implementation of the initiative is also collaborative. Please provide feedback on the tools described herein or practices, tools, or guidance you feel should be part of the initiative. It's a everyone's project!



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Appendix B Construction Management Academy (CMA) Outline

Day 1 CMA Introduction & Project Development	Day 2 Office Management	Day 3 Contract Administration	Day 4 Project Kickoff
<p><i>Class Introductions/Overview</i></p> <p><i>KYTC Organization Relative to Construction</i></p> <p><i>General Overview of Construction and Project Scope (SE/District/Central Office)</i></p> <p><i>Construction Procurement & Guidelines Prior to Letting/Contractor Prequal/Prebid Meetings</i></p>	<p><i>Crew/District Organization</i></p> <p><i>Consultant Inspections (RATs, Paint, Steel)</i></p> <p><i>Personnel Issues</i></p> <p><i>Vehicles & Equipment</i></p> <p><i>Inspector Training</i></p> <p><i>Construction Project Reviews</i></p> <p><i>Construction Resources: Spec. Book, Guidance Manuals, Construction Memos, Plans, Proposals, Websites, KY Methods, etc.</i></p>	<p><i>The CONTRACT</i></p> <p><i>Subcontracting/Rental Agreements</i></p> <p><i>DBE Program and Payrolls</i></p> <p><i>Official Orders</i></p> <p><i>Project Estimates</i></p> <p><i>Submittals & Approvals</i></p> <p><i>Sitemanager: From Project Activation to Formal Acceptance</i></p>	<p><i>Survey Work</i></p> <p><i>Plans and Project Proposals</i></p> <p><i>Project Schedules</i></p> <p><i>Preconstruction Meetings</i></p> <p><i>Site Safety & Traffic Control</i></p> <p><i>Public Relations/Information</i></p> <p><i>Erosion Control/Seeding/BMP/Permit</i></p> <p><i>Utilities & Railroads</i></p> <p><i>ADA & Environmental</i></p>
Day 5 Daily Project Management & Roles & Responsibilities	Day 6 Project Closeout & Claims/Conflicts	Day 7 Project Communication & Partnership	
<p><i>FHWA Roles in Construction</i></p> <p><i>Role of the "Project Engineer"</i></p> <p><i>Role of the Inspector</i></p> <p><i>Completing DWR's & Proper Project Documentation</i></p> <p><i>Construction Revisions & Traffic Control Revisions</i></p> <p><i>Change Orders</i></p> <p><i>Materials Acceptance</i></p> <p><i>Value Engineering</i></p> <p><i>Cost Plus/Force Account</i></p>	<p><i>Construction Conflicts</i></p> <p><i>Claims & Liquidated Damages</i></p> <p><i>Post Construction Reviews</i></p> <p><i>Tort, Subpoena, & Depositions</i></p> <p><i>Hearings & Mediation</i></p> <p><i>Final Inspections (Central Office, District Office, and Others)</i></p> <p><i>Corrective Work & Formal Acceptance</i></p> <p><i>Project Completion Requirements</i></p> <p><i>As-Built Plans</i></p>	<p><i>Professionalism & Ethics</i></p> <p><i>Explanation/Critical Nature of Project Teams</i></p> <p><i>KY Association of Highway Contractors</i></p> <p><i>Partnering</i></p> <p><i>Proper Communication</i></p> <p><i>Conducting Effective Meetings & Frequency</i></p> <p><i>Issue Resolution & Tracking</i></p> <p><i>Project Goals</i></p> <p><i>Managing Projects for Best Value</i></p>	

Appendix C KYTC Escalation Ladder

KYTC ESCALATION LADDER				
Level	KYTC	Contractor		Time to Escalation (days)
1	Inspector	Foreman / laborer / operator		X
2	Staff Engineer	Superintendent		X
3	Section Engineer	Project Manager		X
4	TEBIM	Senior Engineer/Manager		X
5	District Chief	VP/Principal		X
6	State Highway Engineer	President / Owner		X
Instructions				
1. Insert specific names next to titles.				
2. KYTC and Contractor agree on time to escalate issues for each level.				
3. This ladder is not to be used for issues and disputes per 105.13 once TC 63-3-2 is filed.				

Appendix D Sample KYTC Issue Documentation Matrix

KYTC Issue Documentation Matrix										
Contract ID:										
KYTC Section Engineer:										
Issue No.	Issue Status	Issue Description	Issue Origination Date	Issue Reported By	Contractor: Issue General Category	Likelihood of Schedule/Cost Impacts	Impact Consequence	KYTC Action/Response (date each entry)	Contractor Action/Response (date each entry)	Issue Closure Date
1	Needs KYTC Action	Example	14-Jun-19	John Smith (Smith Contracting)	Plans	Likely	Moderate		6/14/2019-The plans show conflicting drainage pipe sizes. Verify pipe size for entrance at STA 8+57 RT.	
2										
3										

Appendix E Sample Scalability Matrix

Scale Your Partnering: In order to determine the level of Partnering that you should apply to your construction project, take a moment to collaboratively assess your project risk factors. The higher the risk, the more intensive your Partnering efforts should be. When in doubt, scale your Partnering efforts upward to set your project up for success; you can always scale it back down once the project is underway.							
Level	Risk Factors*				Desired Level of Engagement	Partnering Structure and Elements	Benefits and Approx. Cost**
	Project Value	Complexity	Political Significance	Relationships			
4	Very Large/Mega (multi-phased highway corridors, complex bridges and structures) (\$250M-\$500M+)	Highly Technical and Complex Design and Construction	High Visibility/oversight Significant strategic project	New Project Relationships including: new contractors, sub, agencies, third-parties, high turnover rate of subs or other high potential for conflict (strained relationship, previous litigation, or high probability of claims)	Very High	Professional neutral facilitator Project charter Multi-tiered Partnering (executive - core team - stakeholder) Monthly Partnering meetings (design through construction) Special Task Forces for specific issue resolution Stakeholder on-boarding/off-boarding Subcontractor on-boarding/off-boarding Monthly surveys Executive sponsorship Field-level decision making Issue resolution ladder and DRB Facilitated dispute resolution	Very high accountability. Issues tracked and decisions made timely. Momentum maintained as progress continues in spite of issues that arise Approx. \$20,000/qtr.
3	Large (new design, new contracting method, or challenging rehabilitation/renovation) (\$10M-\$250M)	High Complexity (short timeline/schedule constraints, uncommon materials, new supply chain, etc.)	Probable - Organizational image at stake	New Contractors or CM, New subs/relationships	High	Professional neutral facilitator Project charter Multi-tiered Partnering (executive - core team - stakeholder) Quarterly Partnering meetings (design through construction) Stakeholder on-boarding/off-boarding Subcontractor on-boarding/off-boarding Monthly surveys Executive sponsorship Field-level decision making Issue resolution ladder and DRB Facilitated dispute resolution	More timely decision-making in field. Stakeholders phased in and out. Designers involved throughout process Approx. \$10,000-\$15,000/qtr.
2	Small (\$5M - \$10M)	Moderate Complexity	Unlikely, depending on the size of the client and place of importance	Established relationships New CM, subs, agencies, or other key stakeholders	Moderate (seeking risk mitigation and project efficiencies)	Professional neutral facilitation (\$5M and above) Required kick-off quarterly follow-ups recommended Minimum 2 Partnering surveys (monthly recommended) Project charter Executive sponsorship Field-level decision making Inclusion of stakeholders Issue resolution ladder and DRB Facilitated dispute resolution	Increased predictability. Reduced (zero) claims. Improved safety. Improved schedule. On or under budget Approx. \$1,000 - \$8,000/qtr.
1	Micro (\$0-\$5M)	Low Complexity	Unlikely, depending on the size of the client and place of importance	Established relationships new CM, subs, new agencies, or other key stakeholders	Moderate/High (seeking risk mitigation and project efficiencies)	Professional neutral facilitator optional Project charter Executive sponsorship Field-level decision making Stakeholder involvement Issue resolution ladder and DRB Facilitated dispute resolution	Increased predictability. Reduced (zero) claims. Improved safety. Improved schedule. On or under budget Approx. \$1,000/qtr.

*Risk factors will vary by project. Though these are the most common, additional factors should be considered if necessary.

**Cost of facilitation based on \$5,000/day and \$500 per scorecard. Please note that daily rates for facilitators can vary widely.



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Appendix F Preconstruction Conference

1. Preconstruction Conference

1.1 General

As soon as possible, after a project has been awarded and the work order has been issued, the district TEBM for Project Delivery and Preservation (PDPBM) should arrange a Preconstruction Conference with the contractor and other interested parties to review items such as construction details and proposed schedules. The Preconstruction Conference is an important meeting and provides an opportunity to establish open and honest communication between KYTC, the contractor, and all involved parties. The Preconstruction Conference can also be used to establish frequency and subject matter of future project meetings, such as pre-pave meetings, pre-pour meetings, progress meetings, and informal partnering.

Before the meeting, the Section Engineer (SE) should study the plans and any special provisions or notes and make a field inspection of the project to get well acquainted with requirements and existing conditions.

To arrange the meeting at a time most convenient to everybody, it is suggested that the PDPBM contact the principal parties about their availability and preferences by telephone after which, formal notification will be made by letter.

1.2 Letter of Notification

The letter of notification is written to the prime contractor with copies distributed to all concerned parties (as shown below). This letter notifies the contractor of items on the agenda and any specific problems or contract requirements that require documentation or submittals at the meeting. The prime contractor should be strongly encouraged to bring any subcontractors of the project to the meeting.

Copies of the letter of notification will be sent to the following:

- FHWA (if applicable)
- All utility companies involved
- Municipal and/or county engineers (if applicable)
- Railroad (if applicable)
- Other specialized or interested parties as deemed necessary

Email notification of the letter will be sent to the following:

- District Executive Director (CDE)
- Director, Division of Construction
- Division of Construction Procurement
- EEO (if applicable)
- Wage Compliance Training (if applicable)
- Division of Maintenance
- Division of Materials

- District Personnel
- Utility Agent (if utilities are involved)
- District Materials Engineer
- District Traffic Engineer

1.3 Record of Meeting

Minutes should always be taken of the Preconstruction Conference and a record made of attendees and who they represent. Digitally record the conference with supplemental notes taken by the PDPBM or designee. The recording becomes a permanent verbal record of the meeting and is retained by the district project delivery and preservation office until the project files are closed out. A written record of the meeting is also prepared in letter form to the Director, Division of Construction, with copies sent to all participants, the District Executive Director's Office (CDE), FHWA (if applicable), and the project file.

1.4 Utilities

Notices should be sent to all utility companies having utility adjustments to be made and those that have already relocated their facilities (particularly if these facilities remain within project limits). Every effort should be made to afford the contractor as much information as possible relative to the location of and timetable for relocating any utilities or, if the utilities have already been moved, the location of the new facilities as well as the old, provided they were abandoned and not removed.

In the event that high-pressure gas lines, telephone trunk lines, railroads, or other utilities of a critical nature are located within project limits, the representatives of these companies should be prepared at the meeting to give the name, address, telephone number, and other pertinent information of their nearest responsible representative.

The district utility agent can assist in making arrangements for the utility companies to attend the meeting, introducing the representatives at the meeting, and, in general, providing background information necessary to understand the overall situation relative to utilities within project limits.

Those items affecting utilities should be discussed immediately following the presentation of the contractor's plan of operation and progress schedule. The utility companies may then be excused if they do not wish to remain for the detailed discussion of the contract work.

If the contractor's schedule conflicts with the removal or relocation of any utilities on the project, an effort should be made to revise the schedules of the utility company, the contractor, or both in a manner satisfactory to all and most advantageous to the work involved.

At every preconstruction conference it is very important that the contractor be advised of their responsibility to ensure that all utilities are marked and not disturbed by operations including lines owned or managed by the Department. The contractor should be made aware of the B.U.D (before you dig) service at 1-800-752-6007. They should be

informed that not all companies are part of this system and that the County Clerk's office can assist in contacting other utility companies.

1.5 Subjects to be Discussed

The following topics shall be addressed in preparing an agenda for the preconstruction meeting:

- Prime contractor and principal personnel
- Project contract time
 - Completion date
 - Procedure for assessment of time
 - Proposed plan of operations
 - Progress schedule for the entire project
- Construction revisions
- Employee and public safety
- Erosion and pollution control requirements
 - BMP
 - Notice of Intent
 - Spill Prevention Plan (if applicable)
 - Other environmental issues
- Project staking
- Construction signing and traffic control
- Labor compliance provisions
 - Submission of payrolls
 - Necessary posters
 - EEO
 - Trainees
 - Minimum wages requirements
- Materials
 - Notification of material sources
 - Material sampling procedures
 - List of suppliers
- Excess material or borrow sites
 - Permits requirements
 - Archeological survey
 - Property owner agreement
- Subcontracts
- Equipment rental and lease agreements
- Contractor evaluation form
- Claims procedures
 - TC 63-32 form, *Notice of Changed Condition/Disagreement*
 - Discussion of process (Section 105.13 of the Standard Specifications)
- Work on or over railroad right of way

- Utility issues
- Project-specific issues and plan issues

This list is not all inclusive of the topics that should be covered for a particular project. Section 108.02 of the Standard Specifications contains a detailed description of the submittals are required at the Preconstruction Conference.

TC 63-64, *Pre-Construction Conference Checklist*, is located on KYTC's website at: <http://transportation.ky.gov/Organizational-Resources/Forms/TC%2063-64.docx>

This checklist should be used as a guide and tentative agenda for the meeting. All items on the checklist will not apply (skip those). Page one should be sent to the contractor and completed prior to the conference.

Appendix G Preconstruction Checklist Guidance Slides

PRECONSTRUCTION MEETING

Presenters:
Chris Slone
Jim Simpson and Nasby Stroop

Preconstruction Meeting Preparation

- ▣ Responsibility of T.E.B.M.
- ▣ Review Plans, Specifications
 - General Notes, Special Notes, Utilities, RR
- ▣ Review Design Documents
 - Aerial photography and videos
- ▣ Site Visit
 - Photographs
- ▣ Schedule received 48 hours prior to meeting
- ▣ Unapproved materials list
- ▣ Eliminate non-applicable (N/A) sections of checklist

Preconstruction Meeting Invitations

- ▣ Who
 - Contractor; sub-contractors; FHWA; Utilities; Railroad; Central Office Construction; Construction Procurement, Maintenance, Materials; District CDE, Utility Agent, Materials, Traffic, Wage Compliance, EEO, Safety Officer, Public Affairs Officer
- ▣ What
 - Include agenda items
 - Special requirements from the contractor (most recent revision of plans)
- ▣ When
 - Time of meeting (include time zone)
- ▣ Where
 - Street address, room number, contact information

Preconstruction Meeting Room & Equipment

- ☐ Reserve an appropriate size room
- ☐ Provide sign-in sheet (printed names with signatures)
- ☐ Digital recording equipment (pro-card)
 - Voice recorder
 - Extended microphone if required
- ☐ Projector (bar charts, photographs, etc...)
- ☐ Laptop (network connection if required)

Work Ahead of Project

- ☐ Review Plans for Future Problems
 - Anticipate questions from contractor.
 - Review utility relocation status.
 - Be aware of potential ROW issues.
 - Note railroad involvement.
 - Obtain NOI documents from District Design Staff.

Communication is Key

- ☐ Make Contact with Contractor Project Manager or Engineer before Preconstruction Meeting.
 - Request items to be submitted before meeting.
 - Subcontracts and/or lease agreements
 - Written Narrative
 - Know material issues, ie mix designs or experimental items.
 - Obtain list of all project contacts prior to avoid confusion.
 - Remember Contractor has been planning for project since bid opening.

Do Your Homework

- Be Familiar with Plans and Proposal.
 - General notes
 - Special notes
 - CAP notes
- Review checklist for items that do not apply to current project.
- Drive project to review in-field.

Have a Plan

- Modifying a Plan is Easier than Formulating One.
 - Section staffing on project
 - Material sampling procedures
 - Submittal procedures

Conduct an effective meeting

- DO NOT CONDUCT THE MEETING AFTER THE MEETING. MAKE SURE ALL QUESTIONS ARE ON RECORD.

Precons are meant to be a GOOD START!

1. Use the Precon Checklist so something important is not left out.
2. Do write up the minutes promptly so that all agreements or explanations are not forgotten.
3. Do send out ASAP so that everyone is in the loop with these agreements.
4. When the minutes are sent out, do include backup documentation such as the schedule, R/W agreements, etc.
5. Do send C.O. Construction a copy with CD recording and do place all in the appropriate Projectwise folder.

Any Questions?

We do appreciate your
time and attention!