

Technology Brief



e-Construction and Partnering: *A Vision for the Future*



Peer-to-Peer Exchanges

Revitalizing and Growing Construction Partnering

Seattle, Washington

October 16–17, 2019

Austin, Texas

November 5–6, 2019



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Background

“Partnering” is a management tool or process frequently used by project owners and contractors to build trusting relationships, achieve mutually beneficial goals, and help ensure successful project delivery. In its current form, this process was first used by the U.S. Army Corps of Engineers for two projects in the late 1980s by combining techniques such as Total Quality Management, Alternative Dispute Resolution, team-building, and collaborative problem-solving.¹ By the early 1990s, more government agencies, including some State departments of transportation (DOTs), had begun using partnering to promote success. Partnering continues to be a focus for many State DOTs to help improve project delivery and relationships with contractors and Federal, State, and local agency partners. As a process and program, it has experienced successes and challenges.

In fall 2019, the Federal Highway Administration (FHWA) sponsored two peer-to-peer exchanges focused on partnering as part of round four of the Every Day Counts technical assistance program for e-Construction and Partnering (eCP). The objective was to bring together staff from several States to share ideas on re-energizing and/or evolving the practice of construction partnering, organizationally and programmatically.

The Washington State DOT (WSDOT) hosted the first peer exchange on October 16–17, 2019, in Seattle, Washington. The California DOT (Caltrans), Ohio DOT (ODOT), and Virginia DOT (VDOT) participated. WSDOT representatives included construction staff from around the State. Representatives from a local agency, contracting firms, the FHWA Washington Division Office, and the FHWA Resource Center also participated.

The Texas DOT (TxDOT) hosted the second peer exchange, which took place November 5–6, 2019, in Austin, Texas. The Arizona DOT (ADOT), Nevada DOT (NDOT), Utah DOT (UDOT), and WSDOT participated. TxDOT representatives included construction, design, and maintenance staff from around the State. Staff from the FHWA Texas Division Office, FHWA Resource Center, and FHWA Headquarters also participated.

WSDOT’s and TxDOT’s peer exchange goals were to recognize and discuss similar topics related to further implementing and growing their partnering approaches. Participants shared practices for using partnering to build relationships, open valuable lines of communication, solve problems proactively, and deliver projects successfully with a focus on safety, quality, cost effectiveness, timeliness, and environmental stewardship while reducing issues that could lead to cost overruns and formal claims. This Technology Brief summarizes the information obtained from all participants in both peer exchanges. See the final page for further information on certain limitations of this document and the non-binding nature of its contents.

¹ [US Army Corps of Engineers. “Partnering: A tool for USACE, engineering, construction, and operations.” Pamphlet# 4-Alternative Dispute Resolution Series. \(2010\).](#)



History and Current State of Practice

Arizona

ADOT, with a partnering program dating back to 1991, was one of the first State DOTs to embrace the practice to help manage escalating construction claims. Due to the program's success, the agency has expanded it to include corporate and organizational partnering opportunities.

California

Caltrans began its construction partnering program in the 1990s, developing a Partnering Program Manager position and providing training programs to staff and to contractor stakeholders throughout the State. Caltrans' program guidelines include requiring partnering on projects greater than \$10 million and 100 working days and encouraging partnering on all projects greater than \$1 million. It is paid by change order with a 50/50 split with the contractor. Supplemental funds are provided on all projects greater than \$1 million. Caltrans offers facilitated dispute resolution and has developed an annual awards recognition program.

Nevada

NDOT published a *Guide to Partnering on NDOT Projects* in 2010. The Guide opens with the following quote from the agency director: "Partnering is our way of doing business, and it is our opportunity to build projects safer, better, faster and cheaper." The agency has instituted professionally facilitated partnering on projects greater than \$10 million. All projects include an escalation ladder, and Dispute Resolution Teams (DRT) are implemented on a project-by-project basis. Additionally, NDOT's program focuses on four major goals: produce quality projects, deliver projects ahead of schedule or on time, produce projects within budget, and increase worker safety.

Ohio

ODOT's partnering program began in the 1990s. The agency established specific guidelines for its policies, procedures, and manuals; developed partnering committees; and established partnering specifications. ODOT has supported its partnering program by providing training, facilitating partnering workshops, offering an awards program, and continuing to develop new champions. ODOT said it has developed strong relationships with its contractors due to its partnering efforts.

Texas

Partnering had been institutionalized at TxDOT, but interest in the program waned in recent years as the agency turned to mostly using the escalation ladder for issue resolution. An electronic escalation system was used at first; however, contractors did not like it, so the system became ineffective and failed. TxDOT has now instituted a new effort called "We Build Texas," which aims to achieve a high-level partnering program



across the State by building organizational partnering and expanding the relationship down to the project level. As part of the program, all TxDOT's districts meet with contractors to discuss general issues typically seen in construction.

Utah

Institutionalized partnering at UDOT has evolved over two decades. The agency developed a *Partnering Field Guide* and has updated it several times, including in 2015 and 2019. The Guide states that “Partnering is a way of conducting business in which two or more organizations make long-term commitments to achieve mutual goals. This requires team-based relationships, utilizing open communication among the participants based on trust, understanding, and teamwork.” All projects are partnered in one of the following ways: formal, requiring an outside facilitator; informal, whereby the resident engineer and contractor project manager facilitate; and semi-formal, using a trained, internal facilitator. The costs are shared between the contractor and UDOT. There is always an initial partnering session, and some projects include executive-level, monthly follow-ups. UDOT's program includes a formal issue escalation process.

Virginia

At VDOT, partnering began in the 1990s and was used formally or informally on 37 contracts that were for large, complex projects and included a professional consultant facilitator. The partnering concept then went somewhat dormant. In the early 2000s, members from industry and VDOT convened as a result of project performance issues and a rise in claims. VDOT's commissioner directed staff to develop strategies for revitalizing the use of partnering concepts. The agency issued Construction Directive 2004-1 to provide guidelines for making decisions and managing the timeliness of project communications. VDOT hired a full-time partnering coordinator to develop and implement the program and published a *Field Guide for Partnering*, contract guidelines, and a new partnering specification and special provision.

Washington

During the late 1990s, WSDOT highly embraced partnering, with many projects hosting formal partnering workshops. By 2005, partnering workshops had faded away, then in 2016, State legislators initiated a provision with a new funding package that set aside \$50,000 for partnering and conflict resolution training to reinstitute the formal partnering program. In 2017, WSDOT and the Associated General Contractors (AGC) of Washington hosted a series of 11, 1-day partnering training sessions. WSDOT project engineers were encouraged to conduct partnering workshops, and WSDOT staff attended the Innovative and Effective Partnering Practices Conference sponsored by NDOT and FHWA in Reno, Nevada. Also in 2017, AGC and WSDOT formed a Partnering Steering Committee that updated WSDOT's initial *Partnering Field Guide*.



Re-energizing a Partnering Program

During the peer exchanges, participants identified circumstances that can affect the evolution of construction partnering practices within public agencies. These include changes in leadership, level of interest or support, availability of training in key skills, and process effectiveness. For example, if a DOT experiences an increase in formal claims, projects to be let, or new contractors bidding the work, or, an influx of new professional staff, partnering approaches and programs may be reconsidered.

Based on experiences within their State programs, peer exchange participants identified the following key elements and approaches to help revitalize, re-establish, grow or adopt a partnering program.

Steering Committee

Agencies may benefit from a partnership steering committee of key business partners and stakeholders to solicit involvement. This committee can help State DOT staff understand the current state of the process and issues to be considered in re-energizing or growing their current partnering program. Contractors, subcontractors, and consultants should be represented on the committee, along with DOT staff from various levels (not just management). The committee's role is to steer the organization and industry in directions that are beneficial for everyone involved to help deliver projects successfully.

Leadership Support/Direction

Executive support from both the agency and its partners is important to the success of a partnering program. Partnering should be viewed as a positive tool throughout the organization, so it is important to lead by example. Leaders should encourage staff to embrace partnering principles at all levels. One way to affect change is to have leaders check in regularly and ask questions such as: How are the partnerships going on your project? Is partnering helping you deliver projects safely, on time, and within budget? How are we doing at managing overall costs programmatically as an agency?

Champion/Partnering Coordinator/Manager

Programs may benefit from a champion who helps direct, monitor, and manage partnering throughout the organization. It was recommended that this be a dedicated staff member with responsibilities such as developing standards and program structure, monitoring program success, and developing a process for sharing the program's results and effectiveness throughout the organization and with industry.

Training

Key components of a training program should go beyond partnering principles to include modules on "soft skills" such as communication, problem solving, and issue resolution and negotiation. The training should include all project team members from all levels and bring State and industry together in a non-project setting. Real-life scenarios or



project situations are helpful. Examples of situations should be specific to construction, inspection, management, and administrative activities. UDOT, WSDOT, and Caltrans have initiated this type of training. The following outline provides examples of the topics covered in these training sessions:

WSDOT Training Program Outline

Welcome & Introductions

Understanding the Significance of Partnering

- Introduction

- Values

- Objectives

- Expectations of Partnering Relationships

Why is Communication So Important?

- Team/Communication Styles

- What Style Are You? Identify your communication style

- Understand the Importance of Communication Differences

- Communication Approaches that Affect Our Relationship

Problem Solving and Issue Resolution

- Identify Problems in Construction

- Identify Barriers to Problem Solving

- When a Problem/Issue Becomes a Dispute/Conflict

- What is the Definition of a Dispute/Conflict?

- Your Style and Problem Solving & Making Decisions

Negotiation and Long-Term Relationships—We're in this for the long haul

What If We Still Don't Agree?

Determining We're at Impasse

- It's Not Personal—Agreeing to disagree

- Using the Escalation Ladder Properly

- Using Other Partnering Tools

- Implementing Decisions Made

- "It's Not the Answer I Wanted and I Don't Agree"

Implementation of Partnering Training

Wrap-Up & Evaluation



Gaining Partnering Support: New Approaches

One challenge identified by peer exchange participants is that partnering workshops can turn ineffective or tedious if they are not tailored to specific projects or teams. As part of re-energizing partnering, agencies can look for ways to re-engage partners to build upon existing as well as new relationships.

Peer exchange participants provided the following examples of new approaches to gaining partnering support.

Risk-Based Partnering

Several States have begun integrating risk assessments and discussions into partnering workshops. The standard elements of partnering, commitment to partnering values, project goal development, and issue escalation plans are still a large part of the workshop and team development. However, there is now a focus on sharing and discussing project risks. WSDOT is using a risk register provided by a partnering facilitator, and VDOT and UDOT developed their own risk registers. VDOT has also created a risk database tool to help avoid risks on future projects.

Operational/Internal Partnering

VDOT is integrating partnering into its Operations Division. This is a new area for construction partnering. It is meant to ensure the success of full stakeholder partnering involvement.

Additional internal agency areas noted by VDOT to be well-suited for partnering include traffic engineering, intelligent transportation systems, dynamic messaging signs, closed-circuit television cameras, fiber technology, connected vehicle technology, system performance management, roadway sensors and detection systems, reduction in vehicle hours of delay, increased asset reliability, and other applications and performance focuses. This would involve developing internal partnering programs and agreements within the State.

Programmatic Partnering

Partnering can be used programmatically between States and key stakeholder agencies by partnering with executive levels at each organization. For example, ADOT has led formal partnering sessions between organizations such as the Bureau of Land Management, several Native American communities, and several local U.S. Forest Service offices. The key is to see that commitments made at the executive level are shared with other levels of each organization.

Design-Build (D-B)

For D-B projects, formal partnering can still be a key focus, although the format may vary to incorporate a project's design aspects.



VDOT provided the following sample topics for a D-B partnering workshop at the design stage:

- Design-Build Process Expectations
- Partnering Commitment
- Communication
 - Communication Plan
 - Roles & Responsibilities
 - Issue Resolution Plan (for design)
- Project Goal Development
- Process/Project Understanding & Development
 - Project Design Reviews & Comment Reconciliation
 - Over-the-Shoulder Reviews
 - Comment Reconciliation
 - Review Process; Responsiveness
 - Early Release for Construction Documents
 - Expectations for Design Deliverables
 - Design Discipline Meetings
 - Risk Analysis & Value Engineering (during design)
 - Schedule Management
 - Phasing and Packaging
- Follow-Up
 - Team Maintenance
 - Partnering for Construction
- Project-Specific Issues

Designing Appropriate Workshops to Ensure Success

It is also key to address any other workshop issues that may impact the continued success of partnering. Peer exchange participants provided the following additional approaches to designing effective partnering workshops.

Right-Sizing

Participants reported that a one-size-fits-all approach does not always apply well to partnering. Several measures can be employed related to right-sizing workshops to ensure they are effective and specific to each project. These include identifying the correct team members to be in attendance and basing the length of the workshop on additional factors beyond the project's monetary size. Complexity is one factor that should be considered. For example, Caltrans is considering adding complexity to its selection matrix based on the risk register completed during the project's design phase. The reason for this approach is that some small projects are very complex and would benefit from formal partnering and professional facilitation.

Facilitation

States' approaches to conducting workshops vary from formal meetings assisted by professional facilitators to informal gatherings run by internal staff. UDOT also includes several contractor staff in workshops as part of an informal approach led by the resident/project engineer and the contractor's project manager. This approach is integrated into the pre-construction meeting. For UDOT, both parties are involved with leading various aspects of the pre-construction meeting, which is not a traditional approach for States.

In deciding how a project should be facilitated, participants noted the following considerations:

- External facilitators should be completely neutral, so there is no conflict of interest.
- Clear facilitation expectations should be established in a specifications/field guide, being careful to note that facilitators need to understand how to approach the differences in the design or pre-construction and construction phases for alternative delivery projects.
- Regional approaches to selecting facilitators can limit an agency's ability to choose those who may have better skills for a certain project.
- Facilitators should adapt their message and approach to each workshop to be the most effective. Partnering workshops should be uniquely designed for each project and team.
- The facilitation workshop should address the needs of the project processes, for example for D-B versus design-bid-build.
- Facilitators may not be able to be as effective if they are also on dispute resolution teams or boards for the same project.
- A current and future challenge is that a large percentage of experienced facilitators are eligible or becoming eligible to retire, and teams are not always comfortable bringing in newer facilitators with less experience.
- Internal facilitators can be effective if properly trained. Specific skills they should have include workshop preparation, report preparation, and the ability to take notes while facilitating the workshop effectively and to maintain a neutral position. Some States said they have not succeeded at using internal facilitators effectively because the facilitators lacked training and were not properly qualified for the task.

Maintaining a Partnering Program

Partnering programs involve consistent maintenance and constant support from all levels of an organization. Leadership has an important role in obtaining feedback on how partnering is working within the State and in being willing to help support improvements to their program. Additionally, continued effort is needed to update and



keep programs fresh, provide additional training, offer a formal awards program for partnering for project teams, and conduct ongoing discussions with local contracting organizations. Organizations that monitor statistics on partnering's impact on managing cost escalation, schedule growth, and formal change orders and then share this information with staff see this as an important step in maintaining the partnering momentum within their organizations.

Peer exchange participants identified the following key areas to consider in maintaining a successful partnering program.

Mandatory versus Voluntary Partnering

The question of mandatory versus voluntary partnering has existed within State DOTs from the beginning of partnering in the early 1990s. The original belief was that the partners—owner agency and contractor—should want to do partnering versus forcing them to participate via a specification. However, over the years, there have been challenges in implementing partnering based on contract issues, including: Is it a bid item, is it change-ordered after the contract is let, and who should be responsible for the costs? States are split on this issue. Some States, such as Caltrans and ODOT, require partnering as mandatory while others, including VDOT and WSDOT, include it on a voluntary basis. Although FHWA supports the process of partnering on a voluntary basis, it does not mandate it on the Federal level.

Peer exchange participants provided the following information related to mandatory partnering requirements on the State level:

- It may give the State a vehicle for establishing consistent processes for communication, contracting, issue resolution, etc.
- It may send a message that leadership supports partnering.
- From a contractor perspective, mandatory partnering can be a positive because it requires smaller project crews to participate as well.
- It generally ensures that a budget line item for partnering is included in the engineer's estimate and contract budget.
- Managers on smaller projects may have challenges with adding a change order for partnering, so mandatory partnering may allow them to budget properly rather than find supplemental funding later. Once a project is awarded, a decision can be made as to what level of partnering is needed based on the project team's relationships and experience as well as the project's complexity. Partnering does not have to include a full-day workshop; right-sizing is important.
- Resident engineers/project engineers may not always receive feedback in terms of the number of claims settled and any arbitration costs after a project has concluded. Mandatory requirements may increase their level of awareness before issues in the field escalate into claims for the DOT.



Contractor Evaluations and Their Effect on Partnering Attitudes

Several of the DOTs represented at the peer exchanges use contractor evaluation programs. For NDOT, UDOT, and WSDOT, these programs are for prequalification purposes. TxDOT is required by State law to administer contractor evaluations. Following are brief descriptions of the approaches taken by these States:

- TxDOT evaluates each project annually and at closeout. The evaluation has nine questions: three questions each on safety, quality, and timeliness. Scores are 1, 2, and 3. Final scores are provided to the site manager. Evaluations are paper-based only and not subject to public records requests. If the standard/average score for a contractor falls below 2, this can affect the contractor's capacity to bid. TxDOT said these evaluations create a challenge because they have affected trust between the agency and contractors. However, partnering gives TxDOT an opportunity to start the conversation with contractors as to why these evaluations are done and to describe how the three goals are measured to help them understand how to keep their scores high.
- WSDOT has a long-standing evaluation program for prequalification. Contractors are rated on six categories, including safety and environmental compliance. A passing grade is 100 out of 160 possible points. If a contractor has a high rating, they receive an acknowledgement letter of superior performance. Contractors with low ratings receive a warning letter advising them that their poor performance rating may affect their bidding capacity. WSDOT staff said this system seems to be working very well and contractors have been supportive of the program.
- UDOT has a contractor evaluation program for prequalification. Contractors initially had some issues with the program's criteria. Some contractors complained that everyone was getting the same score, and smaller contractors were concerned that the capacity limitation was keeping them from growing. UDOT worked with AGC to modify the program to address these concerns and make modifications to improve overall fairness.
- NDOT uses evaluations for prequalification, but it does not affect bidding capacity. NDOT created the program criteria, and AGC reviewed it before it went into effect.



Measuring the Effectiveness of a Partnering Program

Peer exchange participants observed that one question often asked about partnering is: How do you know how well your partnering program is doing?

- ADOT saw the number of claims decrease significantly after its partnering program was established. The agency's issue resolution/escalation process, workshops, facilitation, and partnering champions have helped resolve issues before they become costly claims. Monthly evaluations measure how teams are doing related to their goals. ADOT uses these to identify problems that arise repeatedly on projects, which provides an opportunity to adjust specifications or guidelines with subject matter experts. The agency also solicits input at a statewide, programmatic level using surveys sent every other year to all ADOT, industry, and other stakeholders to monitor the effectiveness of its partnering program. The focus of the partnering program metrics includes effectiveness of communication, fairness, and timely issue resolution. Each of these terms are defined for each team to help ensure clarity and accuracy.
- Caltrans measures partnering on both a project and program level. The project-level measures involve monthly partnering evaluation surveys based on project charter goals, team effectiveness and satisfaction, collaborative problem solving, and value engineering change proposals (VECPs). Progress is measured through follow-up and project deliverables. Caltrans looks at VECPs to document good practices and project savings. On a program level, the agency uses VECPs as an effective way to generate change through partnering. Project-level tracking is useful, but overall program measures generate the most benefit to the agency. Caltrans uses a database to track performance measures, VECP savings and efficiencies, alternative dispute resolution process successes, and reductions in formal claims and arbitration. Figure 1 shows the history of arbitrations filed on Caltrans projects between 1979 and October 2019. The bar for 1999 is colored red to show the spike in arbitrations filed and highlights a tipping point in the re-emphasis of the Caltrans partnering process. Caltrans has seen a steady overall decrease in arbitration filings since that year. While not the sole reason for the decrease, Caltrans' partnering at both the programmatic and project levels has bettered contractor relationships and played a big part in the improvement.



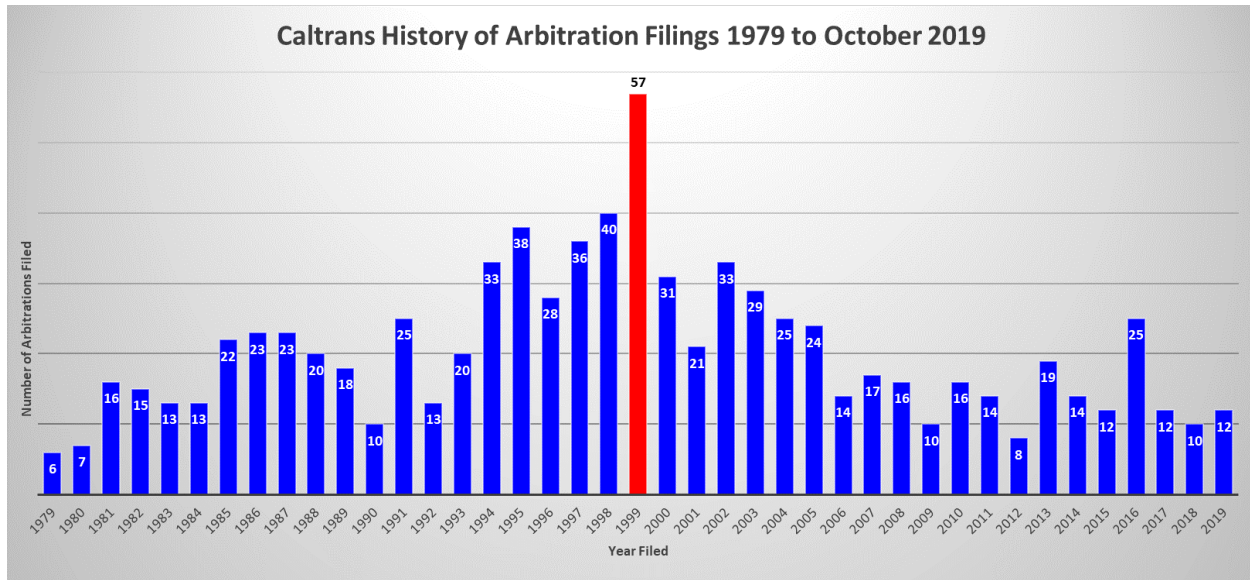


Figure 1. Chart. The number of arbitrations filed at Caltrans has steadily decreased overall following the reemphasis of its partnering program. Source: Caltrans.

Partnering Behaviors: e-Construction Tools and Their Impact, Good and Bad, on Team Communication in the Field

Design and construction within State DOTs have changed considerably in the last 10 years. There is more reliance on digital tools that help deliver projects faster. However, construction is primarily a people-oriented business, where teams build great projects together. The following list includes summaries of peer exchange participant comments and discussions related to managing the use of e-Construction and continuing partnering behaviors through effective communication:

- One of the challenges of communicating in a digital world is that digital technology can create distractions. However, e-Construction provides many overall benefits: mobility, efficiency (one source of the truth, automated workflows, automated submittals, etc.), and ease in retrieving and reporting data.
- e-Construction can create a sense among users that the “system” will communicate issues; therefore, it may result in less personal contact and create a tendency to “hide behind” electronic submissions.
- e-Construction software is not a primary communication tool; it is a documentation tool. Like any tool, e-Construction needs to be used the right way to meet the contract need while building partnering relationships. The following aspects of communication should be considered:
 - Communication is conveying messages by exchanging thoughts or information via speech, visuals, signals, writing, or behavior. Communication requires a sender, a message, and a recipient, although the

receiver may not be present or aware of the sender's intent to communicate at the time of communication.

- Communication best practices include picking the right method to communicate based on the type of message: face-to-face, phone call, email or text, submittal through the system, etc.
- What type of information needs to be communicated? Is it critical to cost, schedule, or safety? Is the communication an apology, feedback or criticism, day-to-day standard communication, contractor or crew rating, submittals, etc.
- To whom does the information need to be communicated? Some communication is contractually defined. Can the person being communicated with use the information? Is it a large group or one person?
- A majority of all communication is nonverbal, which means e-Construction tools could lead to misunderstandings. Texts and emails can be misinterpreted more easily than face-to-face communication or phone calls.

Conclusion

Partnering remains a key component of the participants' State DOT toolboxes, helping these agencies begin projects in a positive manner with an emphasis on team success. The efforts vary by State in detail and scale, but are effective in helping focus the team on managing cost, schedule, and scope.



e-Construction and Partnering: A Vision for the Future

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FHWA e-Construction and Partnering innovation resources

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