Colorado Department of Transportation (CDOT) Dispute Resolution Process Review Project

MILESTONE 3

Final Report

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EXECUTIVE SUMMARY

The objective of this research project was to conduct a detailed review of Colorado's Dispute Resolution Process (DRP) and provide suggestions for improvement to Colorado Department of Transportation (CDOT) DRP. To achieve this objective, the research team collected and analyzed data from CDOT, as well as other Departments of Transportation (DOTs) nationwide. This included content analysis of all 50 DOTs' specification documents' dispute resolution process, a survey administered to State DOTs' employees (71 responses) and their stakeholders (73 responses from contractors and consultants), and a detailed analysis of seven DOTs that supplemented the data collected and included interviews of DOT employees involved in the DOT DRP, as well as contractors and consultants (25 interviews).

Based on the thematic analysis of the data collected, the research team identified seven effectiveness measures that could be used to assess a DOT's DRP. These measures were categorized as primary and secondary measures as follows:

Primary measures

1. Fostering team working relationships
2. Consistent industry involvement
3. DRP adherence
4. Resolving disputes at lowest possible level
5. Timeliness in resolving disputes

Ancillary measures

6. Performance metrics and tracking
7. Training

Considering the effectiveness measures and the comparative analysis between CDOT and other state DOTs, the research team proposes the following summary recommendations. These recommendations aim to highlight both the strengths of the existing CDOT DRP, identify aspects that could be further enhanced, and provide suggestions for improving the DRP:

Fostering working relationships at the project level. Recognizing the significant importance of CDOT's existing partnering strategies (Project First) in ensuring the effectiveness of the DRP, it is recommended to review and establish the key purposes(s) of Project First in relation to dispute avoidance and resolution. Furthermore, coordination between the partnering ladder and the DRP ladder should be established. Consideration should be given to expanding the Project First document in light of the 2006 Partnering Field Guide and updating the descriptors to foster the partnering approach and facilitate positive contractual relationships. Additionally, it is necessary to develop a tracking mechanism for the partnering process and ensure its implementation.

DRP within CDOT's current practices. Review the existing DRP to address the following effectiveness criteria (1) resolving disputes at the lowest possible project level, (2) timeliness of resolving disputes, (3) DRP adherence, and (4) efficiency (time reduction and redundancy removals). The DRP could be tailored/scaled based on the size of the project. In addition, CDOT should rely on project level personnel in the DRP to effectively avoid and resolve disputes at that level and make adjustments as needed to the DRP to reflect the reality of decision-making levels.

Availability of Dispute Resolution Methods (DRMs) to supplement regular claim processes. Tracking the actual dispute and claims resolved through DRB, and educating staff about these numbers would clarify misperceptions about the effectiveness of the DRB process. In addition, the

current process for selecting DRB members, including the required training, should be reviewed to consider the implementation of a formalized training requirement. An option of a Dispute Resolution Advisor (DRA) could be added based on project cost rather than the dispute amount (in addition to the on-call DRB option). The mediation option should also be reviewed to ensure clarity regarding its usage and the process for its implementation as part of the DRP.

Good contract documents. The Specifications Review Committee could include a Disputes Avoidance Review (DAR) Subcommittee, which would be responsible for reviewing both existing and new specifications language to identify potential areas of disputes. The overall DRP, tracking, and training could be designed as a feedback loop that starts with tracking, feeds into specification revisions (if necessary), informs the training materials, and finally loops back to DRP tracking.

Clarity of organizational roles and responsibilities. The review of the DRP should include an assessment of the DRP designated personnel, their roles, responsibilities, and authority, to ensure an effective match with the DRP. Clear communication of organizational roles and responsibilities is crucial at both the project and programmatic levels. Considering the observed disconnect within the hierarchal structure of DRP authority between CDOT and its contractors, it is recommended to revise the process and reduce the steps. This will align better with the hierarchical chain of authority, resulting in reduced implementation inefficiencies and redundancies between the counterparty organizations.

Industry involvement. Establish a partnering framework aside from project-based ones, such as a CDOT-Industry steering committee or a task force that mirrors the process that existed at the initiation of Project First. This steering committee or task force would focus on the entire DRP and Project First (as well as the connection between them) and consider improvements to the process in light of the recommendations that came from this study.

Performance Metrics & Tracking the DRP. CDOT should consider establishing the effectiveness measures it intends to implement for the DRP in light of the proposed measures from this study. The existing tracking system should be updated to align with the established DRP performance measures. It is also recommended to develop a dashboard that includes industry-shared metrics, which can be consistently updated and shared with the industry.

Training. Training programs should be developed for CDOT managers and personnel regarding the CDOT DRP. A DRP module could be included in already existing processes/trainings, such as the post construction review meetings which could act as a feedback loop where the project team can review and provide feedback into the actual implemented DRP. Also, a formalized training for the DRB members is essential.

1 PROJECT OVERVIEW & RESEARCH APPROACH

1.1 Background and Problem Statement

With the construction industry being very complex and competitive, and with participants from different expertise and levels of knowledge working together to achieve contractually set objectives, conflicts and disputes become inevitable. However, declaring being at the point of dispute can be in the parties' best interest as they will need then to find ways to reach an agreement or other resources to help in resolving the disagreement (Scanlon et al. 2018). Disputes on construction projects can result from many factors that vary form one project to another based on the circumstances of each project, but the root causes of these disputes can often be the same (e.g., contractual issues, project uncertainties, and parties' relationships).

It is still a fact that the construction industry is characterized by being one of the most adversarial industries generating disputes and claims. Disputes can lead to profoundly serious problems on the project if not managed properly and at an early stage. They could be very expensive and make the project more complicated to proceed with, as disputes ultimately affect the relationship between parties, as well as the trust to work on future projects (Aritonang & Simanjuntak 2020). Arcadis (2021) reports that the total dollar value of construction claims in the United States increased by more than 100%, from $18.8 million in 2019 to $37.9 million in 2020. The average length of one dispute in North America is 15.2 months.

When both parties come to an impasse in resolving a dispute, they can start utilizing processes and techniques to come to a resolution via a Dispute Resolution Process (DRP). Acknowledging the fact that disputes inevitably will occur, the construction industry has made tremendous progress in developing more efficient methods for dispute prevention and resolution. Litigation is the traditional dispute resolution method (DRM) employed via the courts, where all parties are subject to all forms of discovery, such as document production and depositions. Historically, litigation has had a reputation for being a long expensive process. To avoid litigation there are various methods that can be used, including internal resolution mechanisms or by involving third parties to aid in the DRP. According to the American bar, Alternative Dispute Resolution Methods (ADRMs) such as negotiation, Dispute Review Boards (DRBs), mediation, and arbitration are increasingly used in lieu of or as a step preceding litigation. ADRMs are used to manage claims/disputes on transportation projects as they are known to handle disputes quicker and are relatively inexpensive. It is vital for the disputants to be aware of the positives and negatives of each method, and to ensure the contracts they sign contain the clause that suits them (Aritonang & Simanjuntak, 2020; Chong & Zin, 2012). Some of these ADRMs could be binding to assure parties that they will not have to resort to outside litigation to settle disputes, while others are meant to prevent the dispute from evolving (Dettman and Harty 2008). The question is how useful and effective the DRP has been for State DOTs in resolving disputes, and more specifically how the Colorado Department of Transportation's (CDOT) DRP has performed in effectively avoiding and resolving disputes.

1.2 Research Objective

The objective of this research is to "provide a detailed review of Colorado's DRP and suggestions for improvement to CDOT's DRP." The research team achieved this objective by answering key questions, including:

1. What processes are State DOTs using for avoidance and resolution of construction disputes? What are the lessons learned by State DOTs in implementing these processes? How is the effectiveness of the DRP measured? What processes have been effective in avoiding and resolving disputes?
2. How has CDOT been avoiding and resolving construction disputes on projects? How effective has been the process in resolving disputes as expeditiously and close to project level as possible?
3. What recommendations for improvement could CDOT further implement in the current DRP to avoid/resolve dispute in an effective way?

1.3 Research Approach

The team worked closely with CDOT's Chief Engineer and staff to complete the tasks detailed below (Figure 1):

Task 1. **Peer State Review.** The research team adopted a three-pronged approach using content analysis, survey questionnaires, and follow up in-depth interviews to achieve this task's expected outcomes.

Subtask 1.1 **Content analysis of DOTs' standard specifications.** The team conducted a content analysis of the most current specification books of the 50 DOTs to determine and tabulate their current DRPs. Results are discussed in Section 3.1 of this report.

Subtask 1.2 **Survey questionnaire development and administration to DOTs and associated stakeholders.** A survey questionnaire was administered to support the content analysis and to provide qualitative and quantitative insights into how the effectiveness of the DRPs is assessed. The survey targeted DOT employees nationwide, as well as their stakeholders (such as contractors, dispute resolution providers, construction managers, and design professionals). Results are discussed in Section 3.2 of this report.

Subtask 1.3 **In-Depth interviews with seven state DOTs.** Informed by the content analysis and the survey questionnaire, follow up in-depth interviews were conducted with seven state DOTs in diverse locations and using varying DRPs, to perform a more detailed analysis into their processes and analyze their lessons learned. Results are discussed in Section 3.3 of this report.

Task 2. **Review of CDOT DRP.** The team also employed the same approach in Task 1, yet with more quantitative measures and a more comparative approach based on Task 1 outcomes**.** Results are discussed in Section 2 of this report.

Subtask 2.1 **Content analysis and effectiveness evaluation.** The research team conducted a thorough content analysis of CDOT's Specifications regarding its DRP and DRMs used, and collected the data required for measuring their effectiveness (such as cost, time, and ability to resolve disputes, number of disputes, and level at which the dispute is resolved). This enabled the team to compare the results with other State DOTs.

Subtask 2.2 **In-Depth interviews with CDOT stakeholders.** In-depth structured interviews were conducted with CDOT stakeholders (CDOT staff, contractors, and consultants) to get more in-depth details about the DRP strengths, weaknesses, and any missed opportunities for improvement. With assistance from CDOT, the team interviewed users and non-users of the CDOT's DRP, including active contractors from the Colorado Contractors Association (CCA), among others.

Task 3. **Solicitation of suggestions for changes to the Colorado DRP.** After concise and structured summarization of the results from Tasks 1 and 2, Task 3 compiled all the findings, and included an in-depth analysis of the CDOT's DRP effectiveness and a comparative study to other DOTs to highlight similarities, differences, and opportunities. Section 4.3 highlights the strengths of the current process and how CDOT can capitalize on them, lessons learned from other State DOTs and applicability to CDOT, and process improvement suggestions to the existing DRP.

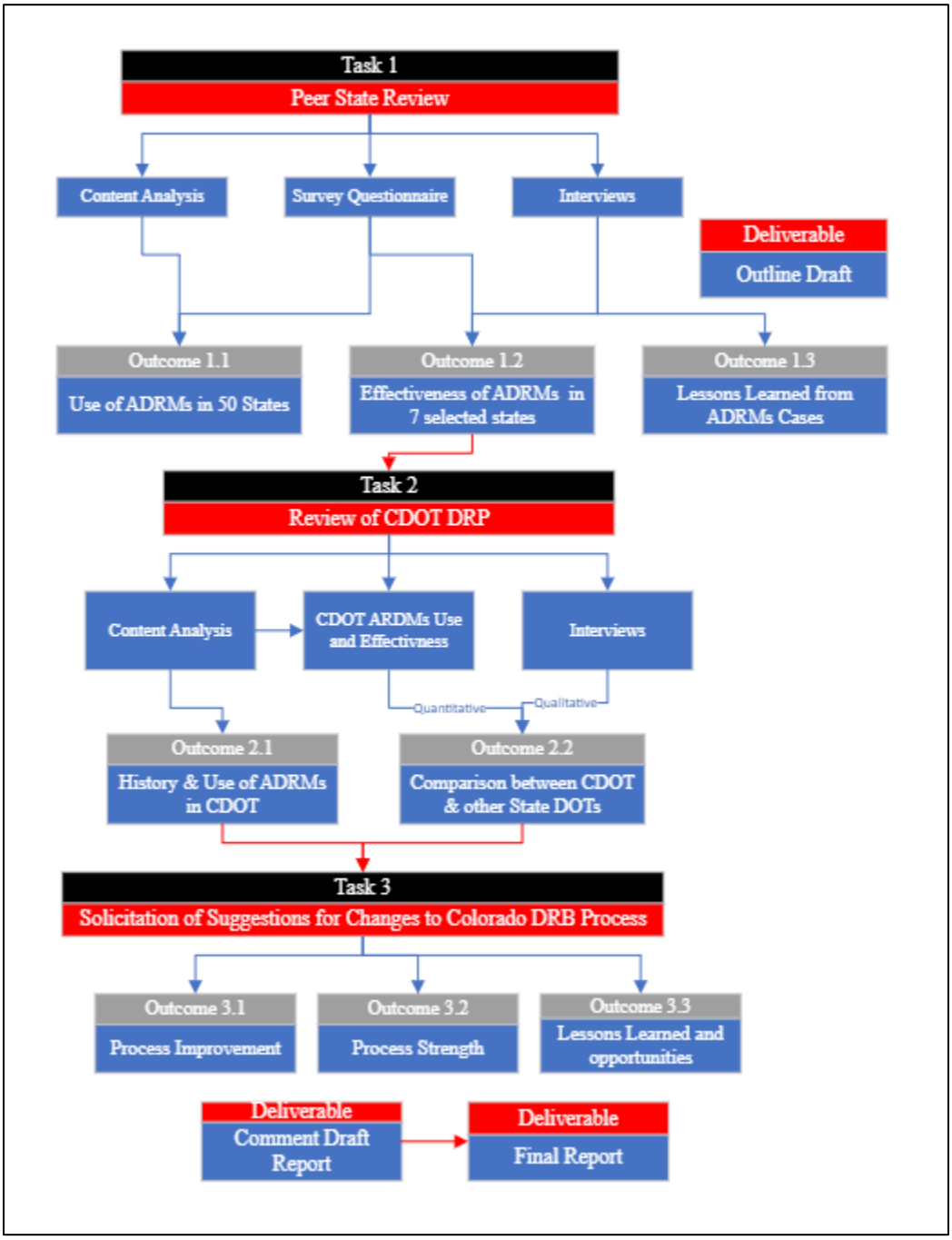


Figure 1: Methodology flowchart

1.4 Report Organization

The subsequent sections of the report are organized as follows:

- Section 2: Colorado DOT DRPs – This section includes the findings from the detailed study conducted on CDOT's DRP.
- Section 3: Benchmarking DOTs DRPs – This section includes the findings from the content analysis, DOTs, and stakeholders' surveys, as well as the detailed study conducted on the seven State DOTs' DRPs.
- Section 4: DRP Effectiveness Measures and Recommendations to CDOT – This section provides a summary of the findings from all the analysis conducted, the proposed effectiveness measures, as well as final recommendations to CDOT.
- Section 5: Limitations and Future Recommendations – This section describes the limitations of the study and recommendations for follow-up and future studies.
- Section 6: References

2 COLORADO DOT DRP

The review and analysis of the CDOT DRP and practices included data collected from (1) content analysis of CDOT standard specifications, (2) a survey administered to CDOT staff and stakeholders, (3) follow-up interviews with CDOT employees involved in the DRP, as well as contractors and consultants, and finally (4) review of the DRP data provided by CDOT.

2.1 Content Analysis – CDOT Process as per Standard Specifications

The content analysis encompassed the review of CDOT DRP in its 2022 Standard Specification document. CDOT's current DRP flowchart is shown in Appendix A. It starts with the contractor providing a notice of dispute to the Project Engineer. Within 15 days, the contractor provides a written REA, details of which are mentioned in section 105.21 of the specifications. Thereafter, the Project Engineer and the contractor discuss the merit of dispute. The PE decides if the dispute has merit or not, within 7 days of the aforementioned discussion. If the dispute's merit is granted, then the quantum negotiations take place within 30 days. In case the dispute's merit is denied, the contractor has the right to accept or reject the denial of the dispute. If the dispute could not be resolved by involving higher level decision authority from the contractor's side, DRB is initiated by the PE. After signing the DRB agreement, prehearing submittal takes place, after which the DRB hearing takes place. If either party rejects the DRB decision, a notice of intent to file a claim is issued within 30 days of DRB hearing. The Regional Transportation District (RTD) renders a decision on the claim which the contractor can choose to accept or reject. If the contractor rejects the decision, mediation can take place. If the dispute is not resolved through mediation, it can go through litigation.

2.2 Survey Findings – CDOT and Stakeholders

This section includes the details of the survey design, development, validation, and piloting before arriving at the final survey (included in Appendix B). It also details the results of CDOT survey.

2.2.1 Survey Design

The research team designed two survey questionnaires to capture two different populations represented by DOTs and stakeholders who engage these DOTs in the DRP, such as consultants, contractors, design firms, and others. The research team identified the survey items based on the study key elements of interest, the discussions with the CDOT team, and the proposal original plan.

The survey questionnaires were composed of several types of questions: (1) questions with ordered and non-ordered choices, (2) questions with open ended answers, and (3) questions with Likert-type scale. The questionnaires were divided into four different sections. The first section consisted of questions on demographics which were related to identification and differentiation of participants such as role/job title, organization type, experience, and background. The second section was focused on the DRP to understand the types of DRMs the respondent uses or engages in. The third section examined the DRP performance, which includes factors such as the average duration of dispute resolution, the preference of the different DRPs, number, and magnitude of escalated disputes in the DRP, among other questions. The fourth section was aimed at assessing the DRP effectiveness through questions related to the

perceived level of fairness, satisfaction, and stakeholders' relationships, along with other targeted conditional questions.

2.2.2 Survey Questionnaires' Variation

The two survey questionnaires' main sections were mostly similar, with several questions intentionally different to capture the perspectives of DOTs compared to other stakeholders. For example, DOTs operate within their state while contractors can operate across different states with different DRPs. DOTs can answer questions about the DRP they own and develop within their specifications, while other stakeholders can only reflect on their perspectives and preferences regarding these DRPs. Therefore, some of the questions varied to reflect the differences of position, depth of understanding, and ownership of the DRP.

2.2.3 Piloting and Validation

Once the first drafts of the two survey questionnaires were developed, research measurement experts reviewed those to ascertain the content validity of the items regarding relevance, representativeness, and technical quality. The research team also sought feedback from the CDOT research team and then piloted the survey questionnaires on seven industry professionals from CDOT for the DOTs version, and 11 DOT stakeholders for the stakeholders' version. Feedback from both groups was incorporated into the final drafts (Appendix A), with a few questions revised and some logic links modified.

2.2.4 Data Collection

The two surveys were sent to all 50 state DOTs and different stakeholders across the 50 states (including CDOT). The DOT survey received 71 complete responses from 15 DOTs (including CDOT). The stakeholders survey received 73 responses from different stakeholders working across 49 states, including Colorado. The stakeholders' survey responses included contractors (47%), consultants (22%), and third-party dispute resolution members such as DRB members, mediators, and arbitrators (31%).

2.2.5 Survey Analysis

The survey data analysis used both descriptive and inferential statistics. Descriptive statistics were used to describe the overall data trends, variability, and for comparisons, in addition to identify frequency of occurrences, e.g., average dispute duration or degree of satisfaction with the DRP. Inferential statistics were conducted to further investigate the descriptive insights by comparing or relating the different variables. The Spearman correlation test was conducted to determine the association and correlation between the variables. Spearman correlation was selected since the variables are not normally distributed and are sometimes ordinal (e.g., Likert scale from 1-5) in nature.

The survey analysis was conducted in three different tiers and groupings, the first is reported in this Section, while the other two are covered under Section 3:

a) CDOT only analysis: This analysis reflects the perception of CDOT employees and contractors as the primary stakeholders.
b) All DOTs analysis: This analysis shows the trends across different DOTs, and how their perceptions and performance can vary or converge across different issues in the DRP.
c) All stakeholders' analysis: This analysis describes the trends across the stakeholders, and how their perceptions and performance can vary or converge across different issues in the DRP.

2.2.6 CDOT & its Stakeholders- Descriptive Analysis

The survey analysis results for CDOT and its stakeholders (contractors in particular) showed trends of agreements and some minor disagreement within the performance and the perception of CDOT's DRP. One of the important findings is that CDOT and its direct stakeholders (contractors) agree on their preference for the different DRMs used, as shown in Figure 2. Both parties mostly agree that their preference is negotiations (lowest level), followed by partnering, mediation, DRB, and finally arbitration and litigation are the least preferred. However, it is noteworthy that contractors were more likely to affirm that the DRP has reduced disputes going to arbitration or litigation compared to CDOT employees, as shown in Figure *3*.

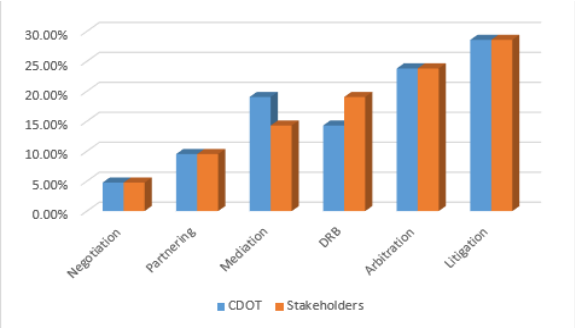


Figure 2: Preference of DRM

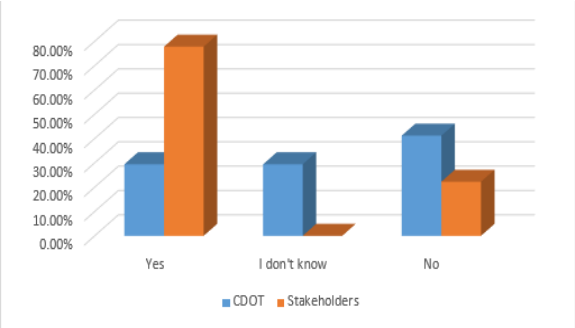


Figure 3: Did the DRP reduce the disputes going to arbitration & litigation?

In terms of fairness and the relationship between the parties after the DRP, as shown in Figure *4* both parties mostly agree that it is neutral, with a substantial response from CDOT (30%) and contractors (24%) indicating that it is unfair and extremely unfair, respectively. However, more contractors (29% compared to CDOT's 0%) think that the relationship is improved after the DRP, while both parties mostly agree that the relationship can worsen after going through the DRP (Figure 5).

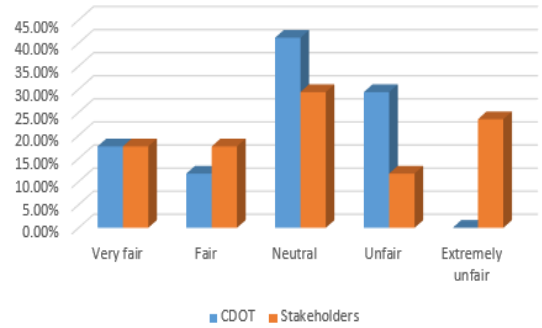


Figure 4: Perception of DRP fairness

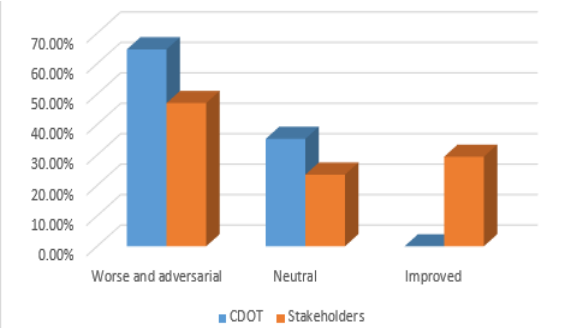


Figure 5: Relationship between parties after going through the DRP

Finally, CDOT's perception of their stakeholders' (contractors) satisfaction with the DRP was mostly accurate, with a more pessimistic view than the contractors' satisfaction level. For example, CDOT's perception of dissatisfied stakeholders (dissatisfied and very dissatisfied) was recorded at 53% while only 29% of the stakeholder respondents reported being dissatisfied or very dissatisfied, as shown in Figure 6.

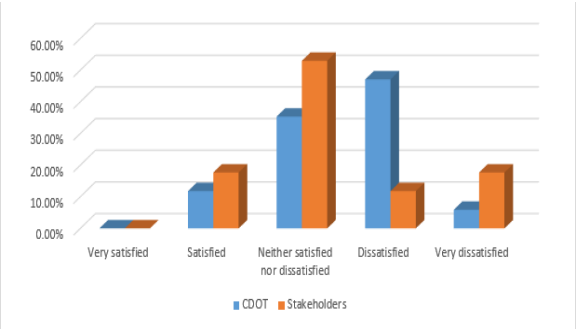


Figure 6: CDOT perception of stakeholders' satisfaction vs. their actual satisfaction

2.3 Interviews – CDOT and Stakeholders

2.3.1 Theme Analysis

The interviews were conducted with CDOT and other DOTs and were then analyzed using "theme analysis." Interview theme analysis is a qualitative research method used to analyze data collected through interviews. This approach involves identifying themes or patterns within the data and interpreting them to gain a deeper understanding of the issues being studied. Interview theme analysis typically involves the following steps:

1. The first step is to transcribe the interviews, which involves converting the audio or video recording of the interview into a written format.
2. The next step is to read through the transcripts to get a sense of the overall content and identify preliminary themes or patterns.
3. After identifying the initial themes, the data is coded, which involves assigning codes or labels to segments of the interview that relate to each theme.
4. Once all the data has been coded, the codes are be analyzed to identify overarching themes or patterns that emerge from the data.
5. The last step of interview theme analysis involves interpreting the themes to gain insights into the issues being studied. This interpretation can involve drawing connections between the themes and existing theories, as well as generating new hypotheses or ideas for further research or recommendations.

Based on the steps described above, the following themes emerged from all the interviews (CDOT discussed in Section 2.3.2 and other DOTs discussed in Section 3.3):

- Theme 1- Adhering to the process/contract. This includes timeliness and documentation/ substantiation.
- Theme 2- Partnering. This includes the use of informal and formal partnering at the project/team level.
- Theme 3- Dispute Review Boards. This includes the concept of standing DRBs for the duration of the project.
- Theme 4- Communication with stakeholders/industry. This includes various coordination and outreach with industry participants.
- Theme 5- Tracking and performance measures: This includes the tracking disputes through the process and measuring performance against established metrics, and disseminating lessons learned.
- Theme 6- Level of dispute resolution. This includes whether the level at which the dispute is resolved is at the lowest possible.
- Theme 7- Training. This includes consistent training developed for the team to understand the DRP.

2.3.2 Interview Findings - CDOT

The research team reached out to CDOT employees as well as contractors through different channels, such as a CDOT bidders listing and CCA to recruit volunteers willing to participate in the study interviews. All the interviewees had to have experience with the DRP and have recently utilized the process to resolve claims and disputes. Accordingly, a total of 10 interviews were conducted that included six CDOT personnel (Chief Engineer, Director of Operations, two Program Engineers, Area Engineer, and Project Engineer), and after a considerable effort, four contractors were willing to participate in the interview. After conducting the theme analysis for all 10 interviews to gain an in-depth understanding within the CDOT DRP from both perspectives, the research team were able to identify the four themes detailed below.

Theme 1: Adhering to the process/contract

- Documentation- Succinct disputes that can address an exact issue is of utmost importance to enable the parties to focus on the real causes of the issue and reach fair and equitable resolution instead of diluting the merit of the dispute and the efforts of the parties to reach a resolution.
- Consistency- Following the escalation process without exceptions gives more opportunities to resolve the dispute and instill a sense of respect to the process among all the participants.
- Notifications- Following the notifications' timeline provide the time needed to analyze the dispute and work together to reach a resolution.
- Dispute Evolution- Capturing the timeline as related to the evolution of the dispute through the various stages along with its quantum and any cascading effects it might have. This enables the parties to understand the tradeoff and the impact of the dispute on other issues and incentivizes them to reach a solution or even a partial solution to continue working without significant impacts on other activities, all while still resolving the issue.
- Accountability- Both parties should respect, follow, and adhere to the DRP timelines more strictly.
- Admission of evidence or supporting documents – Both parties must be provided with all evidence reviewed by the third party (e.g., DRB) and have a timely opportunity if needed to respond and provide their counterargument to that evidence.

Theme 2: Partnering

- Objectivity in separating the people or other concurrent disputes from the issue at hand. Most of the interviewees shared that effective team partnering and specifically teambuilding, which helps in getting to know the people on a personal level, can help in mutual understanding and negotiating in good faith with less adversarial positions.

Theme 3: Dispute Review Boards *– emerged as most recurring theme*

- A strict disclosure process should be in place to prevent any bias of a DRB member.
- The DRB process should be "more binding" to instill respect for the recommendation and reduce further escalation. In other words, DRB process should not be a means to an end but a major milestone that is extremely hard to reject; this means that rejecting the DRB recommendation should be discouraged by different means.
- Consistent and better training for DRB members.
- Enhance the DRB members pool with more rigorous requirement for selection.
- Limit the scope of the DRB members to address disputes within their subject matter expertise (technically and/or contractually), rather than as construction law professionals.

Theme 5: Tracking and performance measures

- Enhancement of the DRP tracking system.
- Establish a process for documentation and dissemination of the lessons learned. This helps in avoiding common mistakes and retains institutional knowledge regarding the DRP in its entirety.

Theme 6: Level at which dispute is resolved

- Having personnel from the project level (lowest level in the DRP ladder) engaged in the process during escalation can help in maintaining consistency in addressing the essence of the problem (depth of firsthand knowledge) and prevent higher management to take positions without full understanding of the different elements and details behind the dispute.
- Resolving the disputes at the lowest level was repeatedly reported as the ultimate measure of effectiveness by most of the interviewees across the board.

3 BENCHMARKING DOTs' DRPS

As detailed earlier, benchmarking existing processes and practices of other DOTs included data collected from (1) content analysis of all 50 states standard specifications documents, (2) survey administered to other DOTs and their stakeholders, and finally (3) follow-up detailed analysis of seven other State DOTs that encompassed interviews with their DOT employees involved in their DRPs, as well as contractors and consultants.

3.1 Content Analysis Findings

This section incorporates the details of the content analysis, including the documents reviewed and the findings divided into the six main aspects studied. This will be followed by the main takeaways that informed the selection of the seven DOTs analyzed in detail.

3.1.1 Documents Retrieved and Analyzed

Content analysis of the 50 state DOTs' standard specifications focused on six distinct aspects that were established to study the DRP of each state across the country. These six aspects were selected to provide an overall understanding of the procedure adopted by each state DOT. The most recent and available state DOTs' standard specification version was identified from each DOT's website. Hawaii DOT specification book was the oldest (dated 2005) and South Carolina was dated 2007. For all other DOTs, the specification books' versions were less than 10 years old, with 28 States all using 2020 versions or newer (see first column of Table 2 for detailed specification book year). The analysis focused only on Design-Bid-Build (DBB) project delivery, so only documents pertinent to this delivery method were retrieved and analyzed.

3.1.2 Content Analysis Findings

The section is divided based on the six aspects the content analysis focused on retrieving from the specification documents.

3.1.2.1 Triggers of the Dispute Resolution Process (DRP)

The first aspect of the content analysis focused on identifying the triggers for initiation of the DRP. DRP was defined by the study as the steps taken by the various involved parties to escalate the process from one dispute resolution mechanism to the other within certain intervals of time (e.g., escalating the resolution process from an internal department review after the department reaches certain resolutions to mediation within 30 days). In most states, the trigger of the process was that the contractor requested either a change to the contract documents or claimed cost or time compensation, and the owner disagreed on the contractor's submitted request, leading the contractor to submit a formal claim.

3.1.2.2 Dispute Resolution Mechanisms Used

The second aspect of the content analysis focused on identifying the dispute resolution mechanisms utilized by the state DOT based on its specifications. For consistency, and to enable comparison between the DOT processes, the DRP was categorized into nine levels as shown in Table 1. The levels are divided into two main categories: (1) Internal Resolution Mechanisms that do not involve third parties, that is, only involves contractor and owner representatives, and (2) External Resolution Mechanism that involves

use third parties to assist in dispute resolution (also referred to as DRMs in this report). The levels start from involvement of personnel and staff at the project level when a disagreement occurs (Level 1), all the way to the involvement of judges and juries in litigation (Level 9). In all cases, when a dispute is not resolved and has a potential to move to a formal claim, the contractor had to submit a notice of claim and notify the engineer promptly when aware of the event or circumstances that will result in a claim, then file an official claim; in some cases, there was an appeal process. Since DOTs have different organizational charts with different hierarchal structures and job titles involving various responsibilities, the definition of the involved staff at this level is provided in the last column to clarify their role (examples of common job titles are also provided).

Table 1. Dispute Resolution Mechanisms Levels Categorization

Resolution Mechanism	Level	Involved staff	Definition of party involvement
Internal	1	Project site staff level	The staff designated to interact with the contractor on site daily (such as Resident Engineer, Project Engineer, Construction Engineer, or equivalent per DOT standards)
	2	District level staff	The staff designated to interact with the contractor in scheduled progress meetings (such as Engineer of Construction, or equivalent per DOT standards at the district level).
	3	Corporate level staff	The staff designated to interact with the contractor only in claim situations (such as Chief Engineer, Deputy, or equivalent per DOT standards at the corporate level).
	4	Claim Committee/ Claim Review Board (first stage)	The committee designated to interact with the contractor when claims are escalated from previous levels.
	5	Claim Appeal Claim Committee (second stage)	The committee designated to interact with the contractor in claim appeal situations, where the contractor does not agree on the first stage of board's decision
External	6	Mediator (Mediation)	A non-binding process, where a mediator assists the parties to achieve a negotiated settlement and the parties retain full control of the process (Yates and Smith 2007).
	7	DRB Members (DRBs)	A panel of experts selected at the start of a project, who are regularly involved in the project and thus are familiar with the project's construction contract and progress; their decision could be binding or non-binding depending on the contract.
	8	Arbitrators (Arbitration)	A non-judicial forum comprising a panel of experts to which a dispute is submitted, by agreement of the parties, who make a binding decision on the dispute.
	9	Judges/Jury/Lawyers (Litigation)	A dispute resolution government run system, involving judges and courts that follows strict rules and vary from state-to-state; the judgment of the court is final and binding (subject to certain appeals).

Table 2 builds on Table 1 by showing the dispute resolution mechanisms used by each state DOT, as well as the total number of steps starting from the project site level to litigation. Table 3 further summarizes the various dispute resolution mechanisms and their respective use in each State DOT. Some state DOTs left the DRM options open for the project team to decide. For example, Connecticut DOT includes options

for the project team (such as mediation, arbitration, and/or litigation), while Oklahoma did not specify any DRM option. A unique process seen in Tennessee DOT's specification document was to include an authorized state representative to perform a review in addition to their internal review process.

It was also key to investigate whether the DOTs specified any proactive methods within their DRP. Only Texas, Nevada, Ohio, and Utah DOTs mentioned these methods in their specification documents. TXDOT stated pre-contract/preconstruction conferences, project pledges, and an issue resolution process (escalation ladder) to resolve contract issues while they are still current. UDOT mentioned partnering, while NVDOT and Ohio DOT stated both partnering and an escalation ladder.

Table 2. Dispute Resolution Mechanisms utilized by State DOTs

DOT *(spec yr.)*	**Internal Resolution Mechanism**					**External Resolution Mechanism**				**# of steps**
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	
Alabama (2022)	x	x	x	x	x					5
Alaska (2022)	x	x								2
Arizona (2021)	x	x	x			x		x	x	6
Arkansas (2014)	x	x							x	3
California (2022)	x						x			2
Colorado (2022)	x	x				x	x	x	x	6
Connecticut (2020)	x					x		x	x	4
Delaware (2021)	x	x	x	x		x	x			5
Florida (2023)	x						x			2
Georgia (2021)	x					x				2
Hawaii (2015)	x		x							2
Idaho (2018)	x	x				x	x		x	5
Illinois (2016)	x	x						x		3
Indiana (2022)	x	x	x			x				4
Iowa (2021)	x								x	2
Kansas (2015	x	x	x	x						4
Kentucky (2019)	x					x		x	x	4
Louisiana (2016)	x	x							x	3
Maine (2020)	x	x	x			x	x	x	x	7
Maryland (2021)	x	x				x			x	4
Massachusetts (2022)	x	x							x	3
Michigan (2020)									x	1
Minnesota (2020)	x									1
Mississippi (2017)	x							x	x	3
Missouri (2022)	x	x		x				x	x	5
Montana (2022)	x	x	x	x	x	x		x	x	8
Nebraska (2017)	x	x				x			x	4
Nevada (2014)	x						x			2
New Hampshire (2016)	x								x	2
New Jersey (2019)	x			x	x	x			x	5
New Mexico (2019)	x		x				x	x	x	5
New York (2022)	x	x	x				x		x	5
North Carolina (2018)	x									1
North Dakota (2020)	x	x	x					x		4

DOT *(spec yr.)*	Internal Resolution Mechanism					External Resolution Mechanism				# of steps
	1	2	3	4	5	6	7	8	9	
Ohio (2023)	x			x	x	x	x			5
Oklahoma (2019)	x									*PS*
Oregon (2021)	x	x	x			x	x	x	x	7
Pennsylvania (2020)			x					x	x	3
Rhode Island (2018)	x	x						x	x	4
South Carolina (2007)	x									1
South Dakota (2015)	x	x	x	x		x				5
Tennessee (2021)	x			x					x	3
Texas (2014)	x	x								2
Utah (2023)	x			x			x		x	4
Vermont (2018)	x	x							x	3
Virginia (2020)	x									1
Washington (2022)	x					x	x	x	x	5
West Virginia (2021)	x						x		x	3
Wisconsin (2022)	x	x	x				x		x	5
Wyoming (2021)	x	x	x					x	x	5

** PS: project specific*

Table 3. Dispute resolution mechanisms used in respective DOTs as per spec documents

Dispute Resolution Mechanism used	DOTs	No. of states
Internal Department Review	All states except Michigan	49
Internal Claim Review Committee	Delaware, Kansas, Missouri, Montana, New Jersey, Ohio, South Dakota, Tennessee, and Utah	9
DRBs	California, Colorado, Oregon, Florida, New York, Washington, Idaho, Wisconsin, West Virginia, Delaware, Utah, Ohio, New Mexico, Maine, and Nevada	15
Mediation	Colorado, Georgia, Indiana, South Dakota, Nebraska, Idaho, Kentucky, New Jersey, Delaware, Ohio, Arizona, Montana, Maryland, Connecticut, Washington, Nevada, Maine, Oklahoma, and Oregon.	17
Arbitration	Mississippi, Illinois, Missouri, Washington, Connecticut, Wyoming, Rhode Island, North Dakota, New Mexico, Colorado, Arizona, Ohio, Pennsylvania, Montana, Maine, Kentucky, and Oregon	16
Litigation	Arizona, Arkansas, Colorado, Connecticut, Idaho, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Michigan, Mississippi, Missouri, Montana, Nebraska, New Hampshire, New Mexico, New York, Oregon, Pennsylvania, Rhode Island, Tennessee, Vermont, Washington, West Virginia, Wisconsin, and Wyoming	29
Left to the project	Connecticut, Oklahoma	2

3.1.2.3 DRMs and internal claim committee members and their selection criteria

The third aspect was the number of the DRM members designated to participate in the process, as well as the selection criteria of these members. In all the states that used the DRB process, the number of DRB members was three. Caltrans though had an option to use one member only, named a Dispute Resolution

Advisor (DRA), on projects of an estimated value between $3 million and $10 million, while CDOT limited one member to the dollar value of the dispute being $250,000. In the states that used mediation as their DRM, only one mediator was to be used to facilitate the dispute resolution. Some states had internal review committees to resolve the disputes, and the number of members were stated as follows:

- Ohio's Districts Claim Committee should consist of three (3) members.
- South Dakota's Claim Committee should have six (6) members
- Alabama's Claim Committee should have five (5) members, while its Appeal Board should have three (3) members
- North Dakota's Review Board should have three (3) members.

The selection of the external members assisting with the DRP, in all cases, was based on mutual agreement of all the parties. For a DRB, the same procedure was followed by all states, where each party selects a member, and the two members select the third member to act as a chair. This third member must be approved by both parties. In mediation, mutual agreement of parties on the selected member was stipulated by all states. In New Jersey DOT's mediation process specifically, the contractor submits a list of six mediators and the DOT chooses one of them. If they reject all of them, they can ask the contractor to submit four additional names. As for the selection criteria, in all the states using the various DRMs, the criteria were based on the members' experience on construction projects with no conflicts of interest.

3.1.2.4 DRP timeline and duration

The fourth aspect of the content analysis was the length of the process, considering that the process starts at the time the contractor notifies the engineer of a potential claim until the dispute gets resolved or ends in court. The length of the process would depend on how far the parties escalate the process. The research team assumed the length to be the worst-case trackable time scenario, where the parties take the claim through the entire DRP levels shown in Table 1. Table 4 lists the DOTs for which the research team was able to track the length of the process based on the specification document's stated process and timeline. All the other state DOTs did not have a clearly specified timeline.

Table 4. Length of process for the DRPs employed by state DOTs as per specification documents

Length of the process	DOTs
More than 200 days	Texas, Illinois, North Carolina, Ohio, Pennsylvania, Virginia, Arizona, Colorado, Tennessee, Alabama, Florida, New York, Hawaii, Arkansas, South Dakota, Wyoming, Delaware, New Jersey, Idaho, Vermont, Kentucky.
100 - 200 days	Montana, Alaska, West Virginia, Maine, Mississippi, Arizona, Oregon, Indiana, Washington, Kansas, Rhode Island, Oklahoma, and Wisconsin.
Less than 100 days	Michigan, California, Utah, North Dakota, Iowa, Massachusetts.

3.1.2.5 DRP and DRM use limitations

The fifth aspect considered investigated the limitations on the use of the DRP. Limitations were seen to be related to number of working days on the project or the cost of the project; some state DOTs had limitations on what DRM could be used based on these two parameters. Table 5 details the limitations imposed by various DOTs on the DRP or the use of DRMs related to project duration or cost.

3.1.2.6 DRP Cost

The sixth aspect the research team analyzed was the cost of the DRP as stated in the specification documents. Note that the actual cost of the process was further investigated during the surveys and

interviews. In all the cases, the cost of the external resolution mechanism was shared between parties in the cases that they used DRB or mediation. In the cases that the internal review was conducted by the state DOT, there was no mention of cost, because it is likely an internal cost to the DOT.

Table 5. Limitations on DRPs in state DOTs as per specification documents

State DOT	Limitation on use of the DRP/DRMs	DRM use or DRP modification
California	Projects over 100 working days and cost as detailed below	DRBs/DRAs to be used in this case only
	Projects between $3 million-$10 million	Dispute Resolution Advisor (DRA)
	Projects over $10 million	DRB
Arizona	Claims less than $200,000	Arbitration
	Claims over $200,000	Litigation
Colorado	Claims less than $250,000	Use one member for DRB
	Claims over $250,000	Use 3 members for DRB
Oregon	Claims less than $5,000	Arbitration
	Claims between $50,000 - $500,000	DRB
	Claims over $500,000	Litigation or DRB
Indiana	Claims less than or equal to $150,000, 20% of original contract amount and 100 days of contract time extension	Engineer will review the project level ruling and issue a written District Office ruling within 45 days
	Claims greater than $150,000 or 20% of the original contract amount or 100 days of contract time extension	District, in this case will further forward the claim, along with the project level ruling and a District Office written opinion to the Central Office for a ruling
Hawaii	Claims less than $50,000	60 days to respond to the claim
	Claims more than $50,000	90 days to respond to the claim
Idaho	Claims less than $100,000	225 days is the length of the internal review, and then mediation or litigation
	Claims over $100,000	255 for claims is the length of the internal review, and then mediation or litigation
New Jersey	Claim is less than $20,000	The internal review process stops at Level 2 (District level)
New Mexico	Claims over $100,000	Track and keep records of the Claim's documents if beyond $100k
Oklahoma	Claims less than $100,000	135 days is the length of the internal review process to get to the RE decision
	Claims over $100,000	180 days to get to the RE decision
Delaware	For Claims lee than $100,000	Contractor appeals after the district engineer decision (level 1) to the secretary (level 3)
	For Claims over $100,000	Contractor appeals after the district engineer decision (level 1) to the claim committee (level 4)

3.2 Survey Findings - All responding DOTs compared to CDOT

The same survey distributed to CDOT employees, and its stakeholders was administered to other DOTs and their stakeholders. Analysis of the survey data collected for the responding DOTs shows the different trends across the explored areas. It also shows where CDOT, as a benchmark, compares to the other responding DOTs in terms of DRP performance, among other areas. Most of the CDOT benchmarked data points were analyzed using the 5-year history of disputes and claims data (provided by CDOT).

3.2.1 DRP Performance:

Upon analyzing DRP performance, CDOT was found to be within the average ranges as compared to other DOTs. As shown in Figure 7, most DOTs average dispute duration lies within the range of 6 (or less) to 11 months which is comparable to CDOT's average of 9 months (calculated from 5-year data). CDOT has been successful as compared to other DOTs in terms of the total number of disputes going through the DRP, as shown in Figure 8, with an average of 7 (35 over 5 years) compared to most DOTs reporting between 11 to 25 disputes going through DRP.

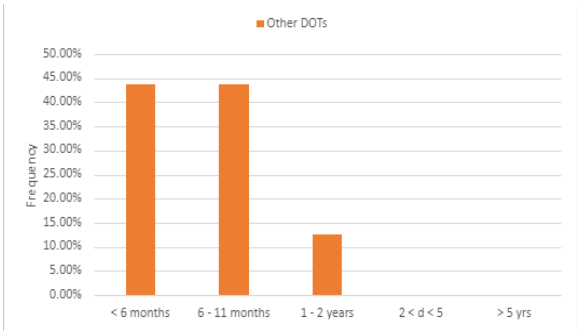


Figure 7: Average duration of disputes

In terms of the magnitude of disputes going through the DRP, almost 30% of DOTs have over $100 million worth of disputes going through their DRP, 22% of them have ranges between $25 to $75 million (Figure 9). In comparison, CDOT has about $77 million. However, this question does not consider the number and magnitude of the total projects executed and their complexity. Therefore, CDOT's performance is within the average as only under $32 million was settled across the 35 claims within a 5-year period (average of $6.36 million/year, $935,000/claim). Sixty percent of the responding DOTs have only less than 5% of the disputes rising to the final stages of the DRP (e.g., arbitration and litigation) and 20% reporting 5-10% rising to the final stages (Figure 10). CDOT numbers were not included in the tracking sheet shared and thus are not compared here.

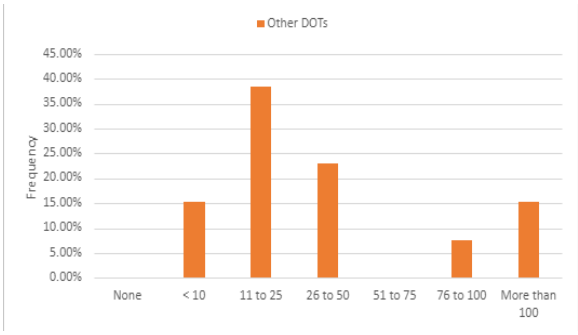


Figure 8: Number of disputes going through the DRP

Figure 9: Magnitude of disputes going through DRP

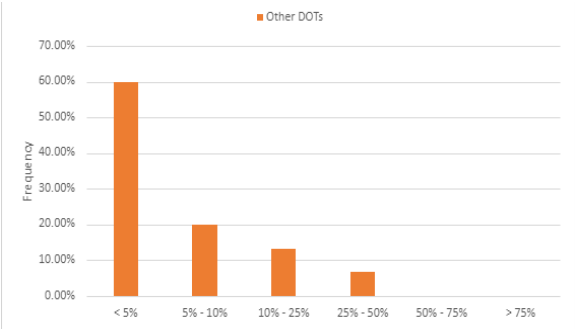


Figure 10: Disputes going to final stages of DRP

3.2.2 DRP Effectiveness:

Upon analyzing DRP effectiveness and its different measures, it was found that only four state DOTs reported measuring DRP effectiveness. The effectiveness measures reported were categorized into measures that were listed as choices in the questions, and others that were stated by the respondents. Figure 11 shows the suggested effectiveness measures responses, with the highest being the stage at which the dispute is resolved. The other measures reported were mostly within the context of timeliness (how fast a dispute can be resolved), acceptability (accepting DRP recommendations at different stages), and avoiding the highest level of dispute resolution (e.g., Arbitration and Litigation).

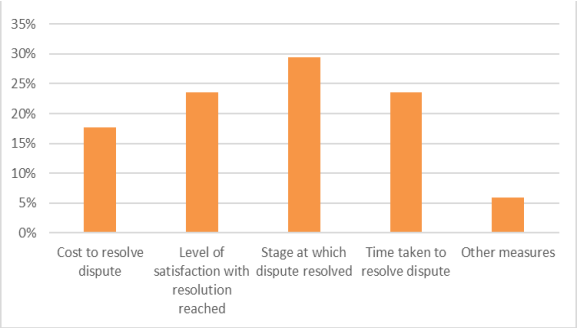


Figure 11: DRP effectiveness measures selected by Other DOTs

The respondents were also asked to rate other measures including their perception of the DRP fairness, their satisfaction with DRP, and their relationship with the other party after DRP implementation. On almost all these three aspects, which are more perceptional than data driven, CDOT was on the pessimistic side; CDOT's response varied between neutral to unfair regarding the DRP level of fairness, neutral to dissatisfied with the DRP, and relationship mostly worsened and adversarial after DRP, compared to the other DOTs perceptions reported as shown in Figure 12 through Figure 14.

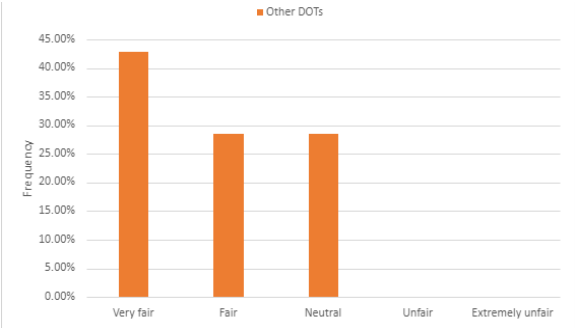


Figure 12: Perception of DRP fairness

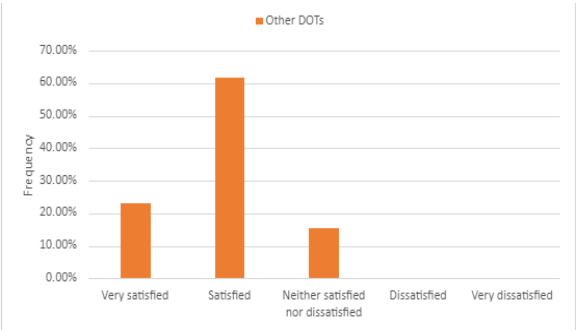


Figure 13: Respondents' satisfaction with the DRP

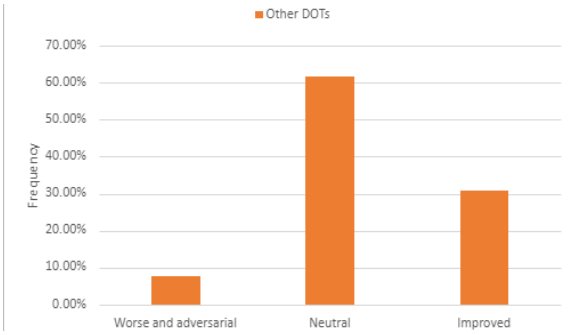


Figure 14: Relation between parties after DRP

3.2.3 Other Notable Results

There were also several other notable analysis results related to different issues which can affect the DRP. Most of the responding DOTs (65%) have made DRP changes and revision in the last 10 years. Almost all DOTs use some form of proactive methods such as partnering, yet only 3 of the responding states have a dollar limitation on when a particular DRP is used. Also, it was noteworthy that 43% of the responding states reported that they do not track all the disputes that go through their DRP. Finally, only 33% of the

responding states reported using different DRP for different project delivery methods. However, they mostly agree - like CDOT - that Design-Bid-Build is the most susceptible to disputes, while CMGC and DB are less susceptible to disputes as shown in Figure 15.

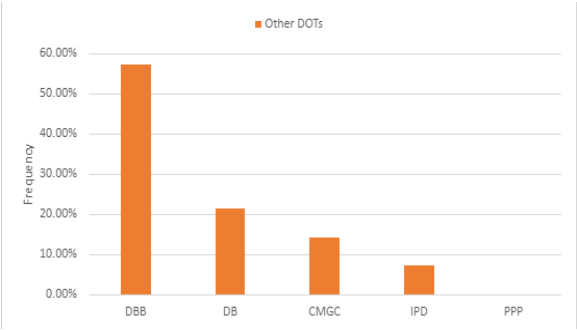


Figure 15: Project Delivery Methods most susceptible to disputes

3.2.4 All responding stakeholders compared to DOT responses

On analyzing the stakeholders' responses, the focus was on identifying major differences compared to the DOTs responses, or identifying the major trends that can benefit the understanding of their preferences and experiences with the DRP. It is important to note that stakeholders can work with different DOTs across different states. Hence, the results show more of the trends and preferences unlike the aforementioned comparison specifically for CDOT stakeholders (section 2.2.6). As shown in Figure 16, according to the stakeholders' experiences, most of their disputes get resolved in the negotiation stages (44%) or the DRB process (31%), with none of them reporting litigation or arbitration as a common method for dispute resolution. Although, some might escalate to those levels, most of the disputes do not.

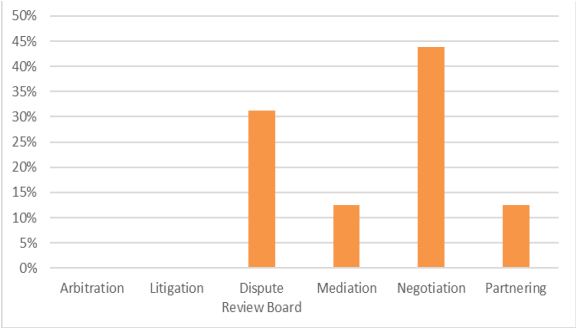


Figure 16: DRM where most disputes are resolved

In terms of DRP performance, most of the stakeholders reported an average dispute duration of less than 6 months (52%) with less than 10 disputes (67%) with their respective DOTs within the last 5 years as shown in Figure 17. The stakeholders reported a wide range regarding the magnitude of the disputes with most of respondents (56%) selecting under $5 million (Figure 18). They also reported a wide range regarding the disputes that went to final stages of the DRP, as shown in Figure 18, with similar results across the 3-stakeholder category, yet some consultants and contractors reported (20% and 36% respectively) that more than 50% of the disputes they were involved in reached the DRP final stages as shown in Figure 19.

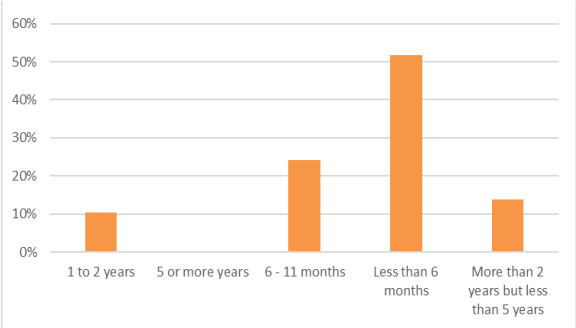


Figure 17: Average dispute duration

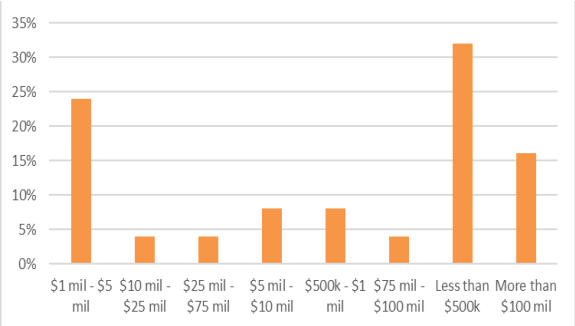


Figure 18: Magnitude of disputes going to final stage

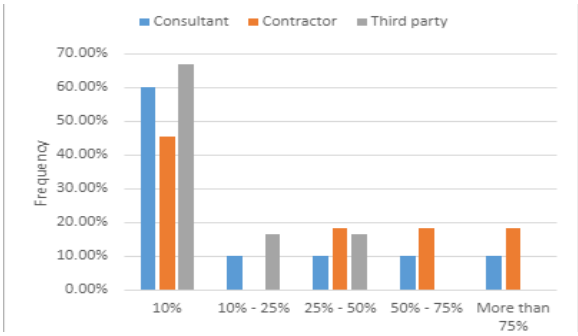


Figure 19: Number of disputes going to final stage

Finally, the data was also analyzed to understand the stakeholders' perceptions regarding the DRP effectiveness and how the different stakeholders perceive different DRPs' fairness, their satisfaction with the process, and its effect on relationships. As shown in Figure 20, results show that consultants and third parties view DRPs as mostly neutral and fair, while most contractors (aside from a minority 10%) perceive most of DRPs as neutral to extremely unfair.

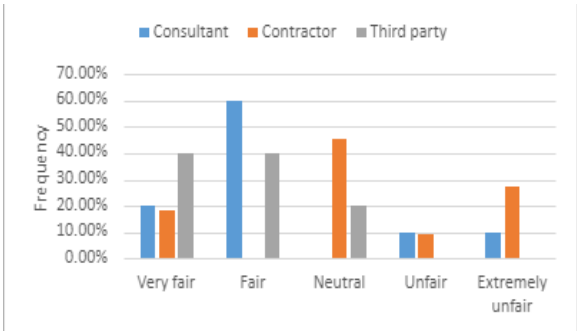


Figure 20: Perception of DRP fairness

Comparable results can be seen in Figure 21 where consultants and third parties are mostly satisfied with DOTs' DRPs while most of the contractors' range tends to be neutral to very dissatisfied. The relationship between the different parties after going through a DRP was reported by the consultants as an improved relationship, contractors perceived it as worse and adversarial relationship, and third parties perceived it as an improved relationship (Figure *22*).

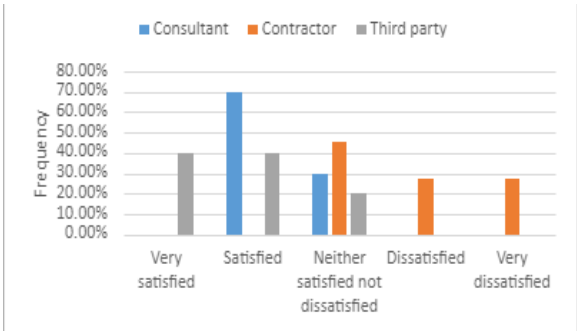


Figure 21: Satisfaction level with the DRP

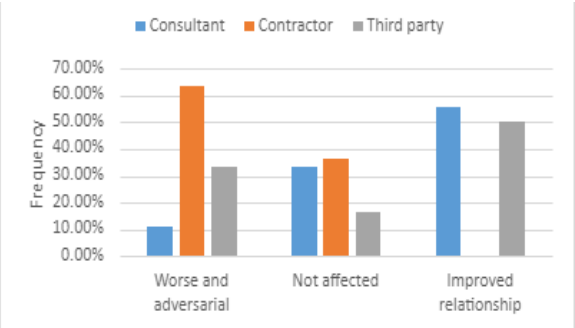


Figure 22: Relationship after DRP

Results of the project delivery methods' (PDMs) susceptibility to disputes show strong agreement with the DOTs data where DBB has the highest susceptibility to disputes, followed by DB, CMGC, Integrated project delivery (IPD), and Public Private Partnership (PPP), as shown in Figure 23.

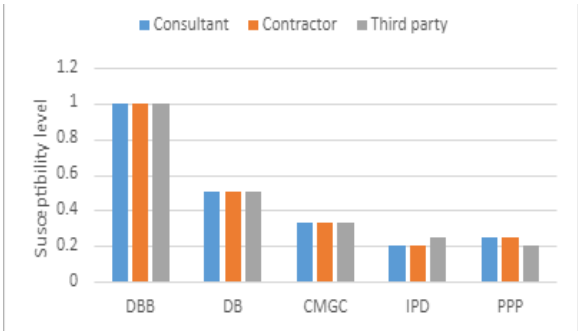


Figure 23: PDM susceptibility to dispute

3.2.5 Inferential Analysis

Inferential statistics was further conducted to identify correlations in the survey data, specifically the DRP and the effectiveness measures, among others. This included computing the Pearson coefficient and checking the significance level; *p*-value less than 0.05 was considered as having a correlation, and p-value less than 0.01 is considered to have a strong correlation. A summary of correlations is detailed below.

Strong correlations (strong statistically significant)

- More recent DRP revisions are correlated to the magnitude of disputes being lower
- More recent revisions to DRPs include proactive methods

- Using proactive methods are correlated to a lower number of disputes going to arbitration and litigation
- Low number of disputes going to final stages, high levels of fairness, good relations between parties after going through DRP, and less duration of disputes lead to a high satisfaction level among all DOTs
- There is a strong correlation between the satisfaction of DOTs and the satisfaction of stakeholders

Statistically significant

- From the data collected from CDOT employees, it was observed that for smaller amount of dollar value limitations, disputes tend NOT to go to arbitration and litigation
- If there are fewer disputes going through the DRP, then the relation among the involved parties is improved for all DOTs
- Stakeholders are satisfied with proactive DRPs

3.3 Interviews - Other DOTs Detailed Study

3.3.1 DOTs Selection Criteria for Further Analysis

To provide initial recommendations of State DOTs DRPs that could be further investigated in the detailed analysis subsequent tasks, the research team identified specific criteria to aid with the selection process. The selection criteria included the state demographics (budget and mileage compared to CDOT), the geographical location (Midwest, Northeast, South, and West Region), and most importantly the level of detail in each of these DOTs DRP. The team selected 15 state DOTs in the initial phase, which were then filtered to the seven DOTs that were studied in detail.

3.3.1.1 Region

A detailed analysis of the four regions' DRP was conducted to investigate any significant trends within these regions, and further inform preliminary recommendations. The ***Midwest State DOTs*** were seen to adopt a detailed internal resolution mechanism (levels 1 through 5), with Kansas and South Dakota having the most steps (all levels 1 through 4). Exceptions though included Iowa and Michigan DOTs, with no internal resolution mechanism stipulated, and Minnesota DOT with only one step (level 1). The Internal Claim Committee is highly used in the Midwest region (level 4), with four DOTs utilizing it. However, external resolution mechanisms are not highly utilized, except for Ohio DOT which utilizes two external DRMs (Mediation and DRBs). Mediation is more common than DRBs overall, four states use mediation, two use DRBs, three use Arbitration. The overall number of steps of dispute resolution mechanisms (internal and external) averages three steps per State DOT, with Ohio and South Dakota DOTs being the highest at five steps, and Iowa having no steps at all stipulated.

The ***Northeast Region State DOTs*** overall have less details stipulated in their internal resolution mechanism while more detailed external dispute resolution mechanisms compared to the Midwest region. Only New Jersey DOT has an Internal Claim Committee. All states listed litigation. Mediation is the most common with three DOTs listing mediation, two listing DRBs, and four listing arbitration. Maine DOT had the highest number of steps of dispute resolution mechanisms (internal and external) with six steps and New Hampshire DOT had the least number of steps (only one step). The overall number of steps of dispute resolution mechanisms (internal and external) averages also three steps per State DOT.

The ***South Region State DOTs*** overall stipulate a detailed internal department review process with three states having Internal Claim Committees. Alabama and Delaware DOTs have the highest number of steps of the internal department review (five and four respectively), as well as the overall number of steps (internal and external combined). External dispute resolution mechanisms are not highly used in this region with more than half of the states not utilizing any DRM. Mediation was still stipulated more in the documents compared to DRB (three DOTs listed DRB while four listed mediation). Only two DOTs listed arbitration. The overall number of steps of dispute resolution mechanisms (internal and external) averages two per State DOT.

The ***West Region State DOTs*** were the ones observed to use the most steps in the DRP, both internal and external. Internal department review is highly used by Montana DOT having the highest number of steps (five steps). Two states used the Internal Claim Committees as well (Montana and Utah DOTs). Most DOTs use external dispute resolution mechanisms. DRB is stipulated more compared to mediation and arbitration (six DOTs list mediation, seven list arbitration, and eight list DRBs). Montana DOT has the highest number of dispute resolution mechanism steps (internal and external). The overall number of steps averages four per State DOT, which is the highest compared to all the other regions.

3.3.1.2 Size (in terms of mileage and budget)

To put the DRP in perspective to DOTs of comparable size and budget, FHWA Highway Statistics Series (FHWA 2022) was investigated to sort the DOTs based on relative budget compared to CDOT. Mileage of public road and bridges data was also collected from the USDOT's Bureau of Transportation Statistics website (USDOT 2022) to sort the DOTs based on relative mileage compared to CDOT. CDOT was reported to have 89,207 miles. Similar state DOT in terms of mileage included North Dakota and Washington DOTs. As for funding, CDOT had a total disbursement for around $2.7 million; similar DOTs compared to CDOT included Iowa, Oregon, and Utah DOTs. These DOTs were thus to be further considered in comparison to the other criteria to select a list of potential state DOTs for further analysis.

3.3.1.3 Dispute Resolution Process Detail Level

The most critical aspect to consider when selecting the DOTs to further analyze was how the DOTs' process could inform CDOT's DRP effectiveness study. Thus, it was critical to choose DOTs that represent a spectrum of ranges in terms of:

- Number of steps entailed in the overall DRP, from a single step (Minnesota DOT) to a maximum of 8 steps (Montana DOT)
- Number of steps included in the DRP internal process, from no internal steps (Michigan DOT) to a maximum of 5 steps (Alabama and Montana DOTs)
- Number of steps included in the DRP external process, from no external steps (Kansas, Minnesota, and Oklahoma DOTs) to a maximum of 4 steps (Oregon and Washington DOTs)
- Similarity to CDOT's process, both internal (such as Texas DOT) and external (such as Washington DOT)

3.3.1.4 Recommendations of State DOTs

Based on the analysis performed, the research team recommended the seven State DOTs shown in Table 6. The criteria upon which the recommendations were made are shown in each column and are indicated where applicable next to the State DOT recommended.

Table 6. State DOTs recommended for detailed analysis

Recommended DOT	Criteria considered				
	Overall DRP (1 - 9 steps)	Internal review (1 - 5 steps)	External review (1 - 4 steps)	Size compared to CDOT [a]	Same region as CDOT
CDOT as baseline	*6*	*2*	*4*		*West Region*
1. California	2	1	1		√
2. Florida	2	1	1		
3. Michigan	1	none	1		
4. Minnesota	1	1	none		
5. Ohio	5	3	2		
6. Texas	4	1	4 [b]	mileage	
7. Utah	4	2	2	budget	√

[a] *similar in terms of budget &/or mileage*

[b] *similar external process*

3.3.2 Other DOTs Findings

The findings presented in this section is not limited to the interviews analysis of the seven DOTs selected, but stems from triangulating the data collected from the following:

(1) DRP content analysis as depicted by the seven state DOTs standard specification documents,
(2) survey data collected from the DOT participants (if available),
(3) follow-up interviews with DOT employees involved in the DRP, as well as their contractors and consultants- a total of 25 interviews were conducted as shown in Table 7. The seven themes (described in Section 2.3.1) that emerged from the analysis will be discussed as applicable in each DOT section.
(4) if provided by the DOT, quantitative and/or qualitative data on their DRP.

3.3.2.1 California Department of Transportation (Caltrans)

In addition to the content analysis of Caltrans spec document, and as shown in Table 7, the interviewees conducted included four interviews from DOT district and central office, as well as a consultant and contractor. The research team compiled all the information received from the surveys, in addition to the documents provided by Caltrans (which included their DRB quarterly reports for the last two years).

3.3.2.1.1 Specifications documents

As per Caltrans 2022 standard specifications document, Division 1- General Provisions, Section 5, Control of the Work, Articles 1.42 and 1.43, Caltrans' process starts with the contractor submitting an Initial Potential Claim to Engineer in response to disagreement with the engineer response to the request for information, followed by a Supplemental Potential Claim, then a Final Potential Claim, with designated timelines (estimated total of about 105 working days). The specification also supplements this initial process with an ADR method (detailed in Section 5.143E), DRB or DRA that applies to contracts with durations more than 100 working days. The contractor needs to exhaust these steps before filing for arbitration or litigation. The specification states that a DRB with 3-member board is used on contracts with a total bid from $3 million to $10 million, while the DRA with a 1-member board is used on projects less than $3 million. It also details the procedures, progress and dispute meetings setup, payment to each member ($200/hour and $2,000/meeting), members selection, meetings, and non-binding recommendation, among others. Thus, as depicted by the specifications, Caltrans DRP includes one internal step through the Engineer and two external steps (DRB followed by arbitration or litigation).

Based on the data reported by Caltrans in their quarterly DRB reports from 2021 to date, 72 claims were referred to the DRB panel in 12 districts. The total number of accepted recommendations were 31, and 41 were rejected by either the contractor or owner.

3.3.2.1.2 Additional DRP information

In addition to the details listed in the specification documents, the interviews also covered practices that Caltrans follows in its DRP, even though not clearly stipulated in the specification documents, as well as some qualitative and quantitative data regarding its DRP. These included:

- *Thresholds to approvals of claim amounts*. There are thresholds for claims that trigger different levels of approvals. Claims under a certain amount can be resolved at the district level, while claims above that threshold must be approved by the Division of Construction at Headquarters.
- *Partnering*. Partnering is recommended for projects under $1 million and mandatory for those over $10 million. Caltrans construction partnering steering committee is made up of internal and external construction partners. They meet regularly to discuss issues and understand each other's perspectives. Partnering is how most disputes are resolved.
- *Tracking methods.* Tracking of claims and the evaluation of the overall effectiveness of the system happen at the project and district levels. Headquarters tracks disputes that go through the ADR process. There is not a formal statewide process for evaluating the system's overall performance.
- *DRB.* The DRB used to be a shared cost between Caltrans and contractors, but Caltrans recently decided to pay for it to incentivize the contractor to utilize the process.

Table 7. Interviewee details for the seven state DOTs

State DOT	Owner	Contractor	Consultant
Caltrans	1. Construction field coordinator 2. District claims engineer 3. Chief Counsel 4. Senior Transportation Engineer	Project manager with 10 years of experience- provides and compiles dispute information to team, negotiate with other party and lead team on DRB	Construction manager- previously at Caltrans for 36 years, and currently works as CM negotiating claims, attending DRB meetings
FDOT	1. Director, Office of Construction 2. State Construction Specialty Engineer	President of contractors' organization, with 22 yrs. construction experience, acts as Chief mediator	Senior project engineer lead consulting firm, manages claims
MDOT	1. DRB program administrator 2. Construction contracts engineer	*<Contractor contacted to be completed>*	Senior Vice President, leading consulting firm, with 30 years' experience
MnDOT	1. State Construction Engineer 2. Project Development Manager	Contractor, with 45 years' experience (medium size contractor)	CEO of a consulting firm
ODOT	1. CM division and State's claims coordinator	Director of Ohio contractors' public agency advocacy (previously 22 years in ODOT)	Senior Vice President, leading consulting firm
TxDOT	1. General Counsel Division 2. Deputy Division Director of Alternative Delivery Division	Project manager for four years (worked on 6 TxDOT projects for last 6 years)	President, Consulting firm, total 34 yrs. experience in DRP, previously claims engineer in FDOT, presented over 200 claims to Claims Committee.
UDOT	1. District Director	Mid-size contractor with 25+ years of experience	NA

- *Lessons learned.* There is no formal tracking of lessons learned from the DRP
- *Magnitude, number, and duration of dispute in the last 5 years.* $1- $5 million which are around 76-100 disputes. Five to 10% move to the last stage of the DRP. Disputes resolution duration range from 6 to 11 months.
- *Fairness and Satisfaction.* Overall, the participants thought the process was fair and were satisfied with it.

3.3.2.1.3 Main themes for elements of a successful DRP- Takeaways

The themes described below are the ones that emerged recurrently in the interviews, or ones that resonated with the themes that emerged from the CDOT DRP analysis (discussed in Section 2.3).

Theme 1: Adhering to the process/contract

- It is key to adhere to the DRP timelines and steps, as well as for team members to understand it.
- Importance of evidence and arguments presented in the claim together with proper documentation.
- Claim submission and documentation quality is difficult but needs to be enforced.
- There should be conversations at the project level about the claims (could be through partnering process).

Theme 2: Partnering

- Caltrans construction partnering steering committee has been effective in helping the industry and Caltrans come together to understand each other's needs and concerns.
- The DOT has made a commitment to partnering, which involves collaborating with contractors and stakeholders to find mutually beneficial solutions to disputes.

Theme 3: Dispute Review Boards

- DRBs being an outside opinion has led to better record-keeping and identification of weaknesses in the districts' processes.
- DRB is the most effective DRM; it helped reduce costs and disputes that go to arbitration.
- Selecting a DRB member in the beginning, rather than waiting until there is a dispute, is key.
- Selection of DRB members is key to their effectiveness as they may vary based on their experience and knowledge. DRB should be able to interpret the contract well and make recommendations.
- DRB members should have regular meetings every three months to stay updated with the project's progress and they should be informed all the time.
- DRB panel should refuse to communicate with either party without the other being aware of the communication, which is key to fairness of the process.
- Caltrans maintains training and education, with yearly DRB training to keep everyone up to date.

Theme 4- Communication with stakeholders/industry

- There is a need for engagement and clear consistent communication between parties in the process to ensure fairness. This includes not only the owners and contractors, but also the design professionals, legal teams, and other stakeholders.
- Better communication and being fair and honest is crucial; everyone involved should come to the table with it. Willingness of all parties to work together to find a mutually beneficial solution.
- Support from upper management could help improve the process.
- Feedback from stakeholders involved in the process is crucial and their willingness to participate in the process is an essential measure of its success. These include regular meetings with the industry, such as the AGC, to discuss any issues that may arise. These meetings typically last an hour or two, while the partnering steering committee meetings can last a day or a day and a half.

Theme 5- Tracking and performance measures

- More performance measures would be helpful in determining the effectiveness of the DRP.

Theme 6- Level of dispute resolution

- The relatively small number of arbitrations given the large number of projects that the construction program manages is a testimony to the DRP's effectiveness.

Theme 7- Training

- Skill and experience of the legal teams involved is necessary
- Maintaining education to project personnel and conducting academy sessions on DRB and construction engineering topics overall

3.3.2.2 Florida Department of Transportation (FDOT)

In addition to the content analysis of FDOT spec document and DRB policy document, interviews were conducted with four participants from DOT district and central offices, a consultant, and a contractor (shown in Table 7). The research team also compiled the information provided by FDOT which included a website link to their posted DRB recommendations (by District).

3.3.2.2.1 Specifications documents

As per FDOT 2023 standard specifications document, Division 1- General Provisions, Section 5, Control of the Work, Articles 5.12.2, FDOT's process starts the contractor's written notification to the Engineer of the intention to make a claim, followed by full and complete claim documentation together with a certificate of claim, A Certificate of Claim means that that the contractor certifies "*under oath and in writing, in accordance with the formalities required by Florida law, that the claim is made in good faith, that the supportive data are accurate and complete to the Contractor's best knowledge and belief, and that the amount of the claim accurately reflects what the Contractor in good faith believes to be the Department's liability. Such certification must be made by an officer or director of the Contractor with the authority to bind the Contractor."* The specification details the content of a written claim, recoverable and unrecoverable items, among others. Thus, as depicted by specifications, FDOT's DRP includes one internal step through the Engineer and one external step which is not explicitly stated (litigation).

There is no mention of how the process escalates to an ADR process though in the specification documents; both the Regional DRB (standing) and the DRB (project specific) processes are detailed separately on FDOT's website and is intended to be flexible to meet circumstances that may arise during the life of the project. DRBs or RDRBs are intended to be used when the contractor has submitted a notice of intent to seek additional compensation but has not yet submitted a written claim. The DRB and RDRB will then generally meet once per month during the first 3 to 6 months and no less than quarterly thereafter, as mutually agreed. Factors to be considered when setting the time between meetings include work progress, occurrence of unusual events and the number and complexity of ongoing or potential disputes or claims. Both DRB and RDRB recommendations are non-binding.

Based on the data reported on FDOT's website on the DRB recommendations by District, 63 total claims were referred to the DRB panel in the seven FDOT districts. The total number of accepted recommendations were 39 and 22 rejected recommendations, and 2 not specified whether accepted or not, in the last 5 years (2016 through 2022).

3.3.2.2.2 Additional DRP information

In addition to the details listed in the specification document and on FDOT website, the research team received information from DRBF on FDOT's process. Interviews also covered some practices that FDOT follows in its DRP, even though not clearly stipulated in the specification documents, as well as some qualitative and quantitative data regarding its DRP. These included:

- *The DRP.* Size and complexity of a project determine which DRM is used.
- *DRB.* Florida is unique in having monthly DRB meetings (typical regular DRB meetings is about three months nationally). Larger projects more than $50 million contract amount, have project specific DRBs, while smaller projects under $50 million is served by the standing regional DRB.
- *Partnering.* Formal partnering is deployed on larger projects, but partnering principles still apply on smaller scale projects.
- *Unwritten advisory opinions*. FDOT recently implemented unwritten advisory opinions, allowing parties to discuss an issue without having issue papers and formal hearings (an attempt to avoid disputes becoming official claims).
- *Tracking methods.* DRBF in Florida tracks some dispute resolution statistics.
- *Lessons learned.* Lessons learned are documented through a process of education and dissemination of information. Any issues that arise through a specification or department policy are addressed in meetings with regional construction contractors and consultants.
- *Magnitude, number, and duration of dispute in the last 5 years.* More than $25 million. 26-50 claims went through the process and less than 5 went through the final stage (unresolved) (10%). Dispute resolution durations range from 6 to 11 months.
- *Fairness and Satisfaction.* Overall, the participants thought the process was very fair and were satisfied with it. The contractor interviewed noted though that there might be some hesitation among contractors who have "lost" a DRB in bidding on FDOT future jobs.

3.3.2.2.3 Main themes for elements of a successful DRP- Takeaways

The themes described below are the ones that emerged recurrently in the interviews, or ones that resonated with the themes that emerged from the CDOT DRP analysis (discussed in Section 2.3).

Theme 1: Adhering to the process/contract

- Documentation is crucial. All agreements and decisions should be documented and communicated to all parties involved.
- The main point of contention seems to be the issue of entitlement; contractors must determine whether they are entitled to additional time and money as per contract documents.

Theme 2: Partnering

- Include partnering sessions on a quarterly basis to help build good relationships between contractors and project staff.

Theme 3: Dispute Review Boards

- It may be better to start with monthly DRB meetings for the first six months before dropping back to the more typical three-month period.
- DRB seen as an active form of avoidance with high success rate in preventing claims from escalating to litigation/arbitration due to regular project meetings held to discuss potential issues.
- DRB is an effective way to resolve disputes in a manner that is fair to all parties involved.
- Occasionally contractors may not agree 100% with a ruling from the DRB but are satisfied with the overall process.
- DRBs have a larger perspective and experience, as they oversee multiple projects and have a history of resolving disputes.
- DRBF now recommends joint selection as the best practice, as opposed to each party selecting their own DRB member (can lead to bias and the same people being selected repeatedly).
- FDOT is creating their own precedent based on DRB interpretations, even though DRB decisions are technically non-binding.

Theme 4: Communication with stakeholders/industry

- Communication importance cannot be overstated when it comes to DRP.

- Building trust can be achieved through consistent communication, transparency, and a commitment to finding common ground.
- Willingness to consider alternative solutions and viewpoints, even if they differ from your own. The ultimate goal is to resolve the issue, not necessarily to ""win" the argument
- There are various committees and groups within the organization that interact with contractors to gather feedback on the DRP and identify improvement areas; this feedback is seriously taken to ensure that the DRP continues to function effectively for all parties involved.

3.3.2.3 Michigan Department of Transportation (MDOT)

In addition to the content analysis of MDOT spec document, interviews were conducted with two participants from DOT (DRB Program Administrator and the Construction Contracts Engineer) and a consultant (shown in Table 7). A contractor will be interviewed; results of which will be incorporated into the final report.

3.3.2.3.1 Specifications documents

As per MDOT 2022 standard specifications document, Division 1- General Provisions, Section 104, Control of the Work, Article 10, Claim for Extra Compensation or Extension of Time, MDOT's process starts with the contractor submitting an intent to file claim followed by filing the claim that contains Form 1953 Claim Content and Certification with details stated. All these steps are within a stipulated timeline (estimated total of about 60 days- no engineer decision timeline is stated in specs). Thus, as depicted by specifications, MDOT's DRP includes one internal step through the Engineer and one external step which is not explicitly stated (litigation). However, MDOT supplements the specs with a published Construction Manual that includes the Construction Contractor Claims Procedure providing more details on the tiered process for the submittal and review of a Contractor's claim, together with a flowchart. The details encompass the timelines for response of Engineer, escalation to the Region Office Review and the Construction Field Services (an additional 2 internal steps) before moving to litigation (total of more than 450 days). There is no mention of how the process escalates to an ADR process in the specification documents, however, MDOT Construction Manual mentions DRB for projects where DRB have been incorporated into the project contract and refers to the DRB procedures last revised in 2020. Instead of moving the claim to the Region, the DRB steps in and a DRB hearing is requested; non-binding recommendations are made before resorting to legal action if not accepted by either party. MDOT special provision language for DRB also specifies more details memberships, DRB payment ($7,500 for DRB hearing, and $3,500 for each DRB progress meeting, shared by both parties), among others.

3.3.2.3.2 Additional DRP information

In addition to the details listed in MDOT specification documents, DRB website, the Construction Manual, and Special Provisions for DRB use, interviews also covered some practices that MDOT follows in its DRP, even though not clearly stipulated in these documents. These included:

- *DRB.* Based on the interviewees, DRB has been implemented since 2013 (80 projects since its inception). DRBs are not used on lower risk projects but rather an ongoing DRB serves the region. DRB process is much quicker than the standard claims procedure, with many time frames being reduced from 30 plus days to just 10 days or less. The DRB special provisions use are required on:

  > *"Design-Build; Movable Bridges; Calendar Day Bid Projects (A+B); Projects with full cleaning and coating of structural steel for any single bridge with a quantity greater than 20,000 square feet; Projects with the special provision for Liquidated Damages for Other Department Costs containing cumulative damages greater than $25,000 per day (24 hours); Projects with any completion date*

incentive amount greater than $25,000 per day; Additional projects as requested by the Engineer. Do not use in local agency projects."

- *Tracking methods.* MDOT used to have a claims tracking database but found it difficult to keep up with all the information. The consultant interviewed noted that a separate job line item is typically created to track costs associated with dispute and change management. The cost can be significant, particularly for larger projects and if outside legal counsel is involved.
- *Magnitude, number, and duration of dispute in the last 5 years.* Around $25 to $75 million. 21-25 claims went through the process. Disputes resolution duration range from 7 to 8 months but can go up to 1 or 2 years. 70% are resolved at PM level, 20-25% at DRB and 5% through arbitration.
- *Fairness and Satisfaction.* Overall, the participants thought the process was fair and were satisfied with it.

3.3.2.3.3 Main themes for elements of a successful DRP- Takeaways

The theme described below is the one that emerged recurrently in the interviews and resonated with the themes that emerged from the CDOT DRP analysis (discussed in Section 2.3).

Theme 6- Level of dispute resolution

- The goal is always to resolve disputes at the lowest possible level to avoid lengthy legal battles
- As per the consultant interviewed, going to arbitration is not a preferred option and they would rather negotiate and take some sort of deal to avoid it. It affects the company's reputation.
- Contractors are incentivized to settle disputes sooner rather than later, as hiring experts and lawyers can be expensive.

3.3.2.4 Minnesota Department of Transportation (MnDOT)

In addition to the content analysis of MnDOT specification documents, and as shown in Table 7, the interviews included two interviewees from DOT (State Construction Engineer and Project Development Manager), a consultant, and contractor.

3.3.2.4.1 Specifications documents

As per MnDOT 2020 standard specifications document, Division 1- General Requirements, Article 1517 Claims for Compensation Adjustment, MnDOT process starts with the contractor notifying the Engineer of potential change to the contract documents requiring additional cost or time which if the Engineer denies will then be followed by the contractor submitting an intent to file claim, then the claim submittal to establish entitlement before the department can consider the impact and cost. Once entitlement is established, the contractor must submit detailed documentation to determine the impact and cost of the claim. The claim submitted should be also certified, i.e., made in good faith and value not knowingly overstated. The contractor should then provide access to relevant documents to the claim (such as time sheets, subcontracts, etc.). Thus, as depicted by specs, MnDOT's DRP includes one internal step through the Engineer and one external step which is not explicitly stated (litigation). There is no mention of any ADR process in the specification documents.

3.3.2.4.2 Additional DRP information

In addition to the details listed in the specification documents, the interviews also covered some practices that MnDOT follows in its DRP, even though not clearly stipulated in the specification documents. These included:

- *Other DRMs.* Mediation and/or arbitration are typically requested by the contractor at the stage when the dispute has exhausted all internal steps. As per a consultant, MnDOT's choice of

arbitration is usually for lower dollar value claims, while mediation is selected to avoid litigation, or sometimes as a court-ordered mediation. Arbitration can be not merit based, thus the choice of litigation.

- *Partnering*. MnDOT implements partnering which can either be formal or informal, with formal partnering involving the department and contractor sharing the cost of hiring a third-party consultant to facilitate the process.
- *Tracking methods.* MnDOT keeps a spreadsheet, along with their chief counsel, to keep track of all the claims that have come through the department. They have also implemented a software system that tracks and manages all aspects of the DRP, including communication, documentation, and deadlines. This system helps to ensure that all parties involved are aware of the status of the dispute and any necessary actions that need to be taken. It also allows for easy access to all relevant information, which can be helpful during mediation or arbitration.
- *Lessons learned.* MnDOT does not have a formal process for disseminating lessons learned related to the DRP, but if a change to its specifications is necessary to prevent a similar issue from occurring in the future, it would make those changes. Contractor conducts debriefs after projects and lessons learned.
- *Magnitude, number, and duration of dispute in the last 5 years.* Not shared. Doesn't happen very frequently that disputes escalate beyond the resident engineer. Dispute resolution duration averages to 6 months, but this is highly variable and dependent on a case-by-case basis.
- *Fairness and Satisfaction.* Overall, the participants thought the process was fair and were satisfied with it. Contractor believes MnDOT is fair in resolving disputes especially with the help of the specialty inhouse staff who have expertise.

3.3.2.4.3 Main themes for elements of a successful DRP- Takeaways

The themes described below are the ones that emerged recurrently in the interviews, or ones that resonated with the themes that emerged from the CDOT DRP analysis (discussed in Section 2.3).

Theme 1: Adhering to the process/contract

- Documentation and capturing updates in daily reports is key when a notice is put from a contractor's perspective, so a proper assessment can be made.
- Escalation ladder helps people understand who the appropriate party is for different issues, especially when it comes to contractors' community versus the department.
- Biggest issue faced is entitlement, and thus should be addressed early in the process, as if it is challenged by MnDOT will move the process to legal action.
- The False claims act in Minnesota puts more responsibility on the contractor to not just be putting in false claims with no basis.
- Keeping positions on certain issues even if of low value is of utmost importance as it sets precedence for the following projects.
- Look at dispute objectively and do not take issues personally as it ultimately is a contract change not an individual issue.

Theme 2: Partnering

- Partnering meetings, where issues are resolved prior to beginning work, have been instrumental in mitigating disputes.
- DB projects require formal partnering. Some projects are large enough on DBB where MnDOT specifies facilitated partnering sessions and agreements.
- Field guide for partnering serves as best management practice.

Theme 4- Communication with stakeholders/industry

- MnDOT has biannual meetings with construction staff to share information about any claims

issues that have arisen and revises special provisions on an ongoing basis. This helps MnDOT be proactive and understand the contractor's needs.

- Pre-activity meetings are another step in the process to ensure both parties understand the project tasks and requirements. They are attended by team members who will be performing the work, such as inspectors and foremen, and the contractors are encouraged to attend.
- Working with industry to clean up contract language (through general contractors' association).
- The more relationships built with the other party helps build a trust level that facilitates the process even before a dispute emerges.

Theme 6: Level of dispute resolution

- Trying to address issues at the lower level before they escalate to a claim process is the most effective approach. The successful resolution of claims is before litigation or trial.
- Direct negotiation is most effective as the staff most close to the issue are the ones discussing and resolving it.

Theme 7: Training

- Lack of experience in the industry can lead to more disputes, thus the need to provide resources and training to help new people entering the industry.

3.3.2.5 Ohio Department of Transportation (ODOT)

In addition to the content analysis of ODOT spec document, and as shown in Table 7, the interviews included an interview with the CM division and the claims coordinator, as well as a consultant and contractor. The research team compiled all the information received from the surveys as well as the documents provided by ODOT which included their claims tracking sheet.

3.3.2.5.1 Specifications documents

As per ODOT 2018 standard specifications documents, Section 100- General Provisions, Articles 108.02, ODOT's process starts with a partnering clause that explains the intent to develop a proactive effort and spirit of trust on every project. Self-facilitated Partnering cost that is performed by the Project personnel is incidental to the contract. The specifications detail the partnering practices including initial partnering session where goals are set, communication channels are developed, opportunities for project enhancement or critical issues are discussed, among others. The specifications also detail various progress meetings and partnering monitoring (which includes online surveys). If requirement to revision of contractor or a dispute emerges, the contractor starts by notification, which then moves through the department's Dispute Resolution and Administrative Claim process: a 3-step process (Onsite Determination, followed by the District Dispute Resolution Committee, then the Director's Claim Board hearing or utilization of an ADR (either mediation or arbitration) or DRB. The specification details all information that needs to be submitted in every step. Along with timelines.

ODOT central office maintains a tracking sheet to track claims that move to Step 2. The sheet includes the Claim no., District no., level at which the claim was resolved, amount and time requested, steps 2 and 3 Notice of Intent, hearing date, Step 2 decision date, and contractor response date. On analyzing the sheet in the last 2 years, it included a magnitude of $3.3 million in filed claims in the last 3 years, with an average dispute of about $55,000. The average time was about 4 months (when Step 2 starts). 30% of disputes were resolved at Step 3 and 60% at Step 2, with the remaining dropped before the Step 2 meeting.

3.3.2.5.2 Additional DRP information

In addition to the details listed in the specification documents, the interviews also covered some practices that ODOT follows in its DRP, even though not clearly stipulated in the specification documents, as well as some qualitative and quantitative data regarding its DRP. These included:

- *DRBs* are used on larger project, while DRAs are used on smaller projects .
- *Lessons learned.* After-action review is conducted for every project, including claims and disputes, to document lessons learned and disseminate them through training.
- *Magnitude, number, and duration of dispute in the last 5 years.* $1- $5 million which averages 10 claims per year. 5-10% moved to highest level. Averaged 10 claims per year in the past decade. Last year, there were 35 Step 2 disputes, of which 12 led to a claim. This year, there were 25 Step 2 disputes, of which only 2 led to a claim. Currently, there are 4 cases that will be heard within the following month. Since 2016, the Level 1 project team has had an average of 1.5 cases go to the Court of Claims. Disputes resolution duration range from 6 to 11 months. ODOT allocates approximately 0.3% of total project budget to dispute resolution.
- *Partnering*. It is where most disputes are resolved; mediation is the least.
- *Fairness and Satisfaction.* Overall, the participants thought the process was fair and were satisfied with it.

3.3.2.5.3 Main themes for elements of a successful DRP- Takeaways

The themes described below are the ones that emerged recurrently in the interviews, or ones that resonated with the themes that emerged from the CDOT DRP analysis (discussed in Section 2.3).

Theme 2: Partnering

- Long-term industry partnership is key, not on an individual project.

Theme 3: Dispute Review Boards

- Better utilization of mechanisms such as DRAs and DRBs positively affects DRP success.

Theme 4: Communication with stakeholders/industry

- Build a culture of fairness by continuous effective communication with parties involved.
- Provide flexibility and authority to encourage project-level resolution.
- Formalize a process for receiving contractor feedback.

Theme 5: Tracking and performance measures

- Data on the DRP can help guide future changes.
- Reviewing aggregated data from different contractors across the country to analyze trends in types of processes, layers of resolution, time, and money.
- A need for aggregated data and historical records such as DRB selection process, recommendation process, dispute structure and format (succinctness and justification for the dispute, timing, and notices)

Theme 7: Level of dispute resolution

- Solving issues at lower level is key to efficient resolution (avoiding a court-like approach)
- Effectiveness of the team is measured by the amount of time it spends in court.

3.3.2.6 Texas Department of Transportation (TxDOT)

In addition to the content analysis of TxDOT specifications documents, and as shown in Table 7, the interviews included two interviewees from DOT (Deputy Division Director of the Alternative Delivery Division and General Counsel Division), as well as a consultant and contractor.

3.3.2.6.1 Specifications documents

As per 2014 TxDOT standard specifications document, Item 4, Article 7, Disputes or Claims Procedure, TxDOT process starts with a certified claim at the project level (TxDOT PM), followed by the District Manager and Program/Area Manager, followed by the District Engineer, then the at the central office level to the Contract Claim committee, which if not resolved moves to State level appeal litigation. In addition to the specification documents, a Revised Dispute Resolution Procedure, Contract Claim Procedure, and Contested Case Procedure dated September 2021 also include further details on the DRP. It clarifies that TxDOT's Construction Division Construction Support Section provides dispute resolution support to Districts/Divisions. All contract claims submittals are analyzed by the Claims Section of CST in a 10-step review process that is detailed in the document (total duration to resolve dispute about 12-19 months). If a contractor is dissatisfied with the CCC's decision, the contractor may request a formal administrative hearing to resolve the claim under Title 43 of the Texas Administrative Code (relating to Procedures in Contested Cases). Thus, as depicted by its specifications, TxDOT DRP includes three internal steps and one external step.

3.3.2.6.2 Additional DRP information

In addition to the details listed in the specification documents, the interviews also covered some practices that TxDOT follows in its DRP, even though not clearly stipulated in the specification documents. These included:

- *DRP.* The dispute resolution ladder is not a linear process, and different types of disputes may require different methods of resolution. There have been some changes to the process in the past four years, with a transition to using panels as the primary method for resolving disputes. For the majority of the state's projects, the state has moved away from binding DR entity, and is using the panel to informally resolve dispute. The panel process is still in its infancy, and it may take some time before it becomes the norm for the state's DRP.
- *Partnering*. Facilitated Partnering is used on larger projects
- *Tracking methods.* TxDOT does not have a specific tracking system, but the construction division keeps track of the number of claims and the ones that are resolved through their claims processes. The consultant interviewed had set up a tracking system in the early 90s when at TxDOT. Tracking system was used for historical purposes and to manage claims and reviewers in the department.
- *Magnitude, number, and duration of dispute in the last 5 years.* 11 claims. Other info not shared.
- *Fairness and Satisfaction.* Overall, the owner and contractor thought the process was fair and were satisfied with it. Consultant was neither satisfied nor dissatisfied with the process.

3.3.2.6.3 Main themes for elements of a successful DRP- Takeaways

The themes described below are the ones that emerged recurrently in the interviews, or ones that resonated with the themes that emerged from the CDOT DRP analysis (discussed in Section 2.3).

Theme 1: Adhering to the process/contract

- The DRP which involves estimating the impact, monitoring the impact, and creating a schedule to illustrate the impact is helpful in resolving disputes at a lower level and avoiding escalation.
- It is important to have the right analysis in the DRP so that parties can make informed decisions efficiently without impacting their relationships.
- Consultant thinks more work needs to be done in the areas of merit-based decisions, independence, and expertise. Contractor agrees the process can be improved by encouraging contractors to adopt a merit-based approach and analyzing their submissions carefully.

- Push the district engineer to be more merit-based and less equity-based. Decisions made through equity often have an element of overlooking a contractual requirement in order to compromise.
- Abide by dates and processes outlined and be well-versed in understanding the contract.
- DR members should follow best practices to avoid issues that arise from not adhering to contracts.
- Improving specifications can prevent disputes. For example, a specification detailing the time of impact analysis method to be used for delay analysis helped prevent disputes in this area.
- Clear organizational structure and process in place for handling disputes.
- Independence of the construction division in the claims branch is sometimes challenged based on different personnel, which can lead to bias. Claims Branch needs to be independent and comfortable making decisions that might not be well-received by the districts. They should be willing to be fair, even if it means agreeing with the contractor.

Theme 2: Partnering

- Partnering helps all sides, as they get a say in what occurs, instead of just being given answers; it is a collaborative approach to establish long-term relationships
- Partnering can help prevent disputes from arising and from escalating to legal action, thus saving time and money for everyone involved.
- It is not a dispute resolution tool but rather a communication tool.
- When partnering was first implemented in the 90s, it was pushed hard, and they had retreats for it. However, now not as intense, a partnering facilitator is hired to get the parties talking.
- Partnering is not quite a culture; every project has their own personnel differences
- Partnering is different between the traditional and alternative sides of the organization. On the traditional side, all project personnel get together, while on the alternative side, it's executives getting together. Risk management has taken a bigger role than partnering,

Theme 3: Dispute Review Boards

- DRB is intended to provide a neutral party to force both sides to organize their arguments and present them clearly.
- Controversy about the high pay rate of the panel members and their lack of knowledge. The group is working to refine how panelists are paid and to select good members who have the necessary expertise. Immediate focus is to build a pool of panel members and ensure that they are trained and certified to do the job effectively. The panel members' lack of understanding of the project and contract is a major concern.
- DRB approach is better because it is independent, and the board members are knowledgeable about the project. On the other hand, the Claims Committee gets put together to hear a claim, and they might not have seen the project before, heard about it, or know the people. The farther away you get from being able to tell your story, the less merit-based it becomes.

Theme 4: Communication with Stakeholders/industry

- Transparency and high level of communication are effective in handling disputes (contractor)
- Process needs to be more transparent and equitable to build trust between the parties involved.

Theme 5: Tracking and performance measures

- The consultant's company had a highly data-driven approach to tracking disputes. By analyzing claims data and conducting analyzes to identify the root causes of disputes, the organization was able to inform its stakeholders on where the problems lay and develop best practices for early detection and prevention of disputes.

Theme 6: Level of dispute resolution

- Best way to resolve disputes is at the project site level; most disputes are resolved at that level.

Theme 7: Training

- Constant need to re-train and educate personnel on the DRP, which can be time-consuming and

challenging. Training is key in ensuring best practices and process is followed.

- Hold mock dispute meetings to teach dispute resolution techniques and help stakeholders practice resolving disputes in a controlled environment (Consultant)
- Training new individuals to be aware of the process and timeline while maintaining the process is essential.
- Having a knowledgeable committed consultant is helpful to the contractor, as it becomes a first step, and most smaller value disputes are resolved at that stage.
- Having people skilled in the art of analysis is the best way to avoid disputes and become more merit based. DOTs should invest in professionals who bounce from project to project and develop a great deal of experience <Consultant>"

3.3.2.7 Utah Department of Transportation (UDOT)

In addition to the content analysis of UDOT's spec document, and as shown in Table 7, the interviews included one interview with the DOT district director and a contractor.

3.3.2.7.1 Specifications documents

As per UDOT's 2023 standard specifications document, Section 00777 Change Management, Articles 1.17 through 1.21, UDOT's process is as follows:

i. Intent to file a claim to Engineer
ii. Certified claim with details to Engineer (basis for entitlement and the resulting costs). Contractor makes a good-faith effort to settle a claim by utilizing the Partnering Escalation Ladder identified in the Partnering Field Guide prior to submitting a claim and requesting a meeting with the Claims Review Board)
iii. Written request for a higher-level review if not in agreement w/Engineer's decision
iv. Claim Review Board (CRB). Claim referred to CRB when requested for independent and impartial review, written findings, and recommendations to Department's Deputy Director.
v. The Director of Construction schedules a hearing before the CRB when deemed to be in the best interest of both parties based on the request for a higher-level review.
vi. Offer of Settlement or Rejection of Claim: Department Deputy Director makes an offer of settlement if the offer is less than the amount required to be reviewed by the Transportation Commission (administratively final decision),
vii. Contractor may elect to file a complaint in State court if not in agreement.

In addition, the specs include a section on DRBs (Section 00747) to be used as part of the partnering process (supplements and does not replace the escalation process). Thus, as depicted by specs, UDOT DRP includes three internal levels (steps) and two external DRMs (DRBs and litigation).

3.3.2.7.2 Additional DRP information

In addition to the details listed in the specification document, the interviews also covered some practices that UDOT follows in its DRP, even though not clearly stipulated in the specification documents, as well as some qualitative and quantitative data regarding its DRP. These included:

- *Partnering*. Department's field partnering guide provides guidance on how to handle disputes and claims, and the escalation ladder. DOT hires a third-party independent facilitator to lead initial partnering kickoff meetings and monthly or quarterly partnering update meetings on larger projects. This facilitator's job is to facilitate dispute resolution or partnering in general. On smaller projects, the DOT uses in-house facilitation.

- *Tracking methods.* They do not have a tracking method but consider it a good point to look into.
- *Magnitude, number, and duration of dispute in the last 5 years.* Ones that rise to the level of the CRB between one and two a year, making a total of between five and ten in a five-year period.
- *Fairness and Satisfaction.* Overall, the participants thought the process was fair and were satisfied with it.

3.3.2.7.3 Main themes for elements of a successful DRP- Takeaways

The themes described below are the ones that emerged recurrently in the interviews, or ones that resonated with the themes that emerged from the CDOT DRP analysis (discussed in Section 2.3).

Theme 1: Adhering to the process/contract:

- Key people involved in the project should be identified, and their roles and responsibilities outlined (UDOT has a table) to ensure that the project team is aware of their responsibilities and can communicate effectively to prevent disputes from arising.

Theme 2: Partnering

- Partnering is by far the most effective tool to resolve issues and claims at the lowest level.
- Department's field partnering guide provides guidance on how to handle disputes and claims, and the escalation ladder, which helps the team know when to escalate a dispute to the next level if they are unable to resolve it at their level. This escalation ladder helps to prevent disputes from escalating to claims and can save time and resources for both the contractor and the department

Theme 4: Communication with stakeholders/industry

- Importance of effective communication and collaboration among the project team to prevent disputes from escalating to claims.

3.4 Comparison of CDOT to other DOTs

The study treated CDOT as the benchmark DRP; Table 8 summarizes, compares, and compiles the seven peer State DOTs in terms of their DRPs and essential practices compared to CDOT. Table 9 summarizes the seven themes that emerged from the seven State DOTs detailed study in terms of frequency. It is seen that the most reported themes are partnering and communication with stakeholders/industry (cited by 6 out of 7 DOTs) followed by level of dispute resolution (cited by 6 out of 7 DOTs) then adhering to the process/contract (cited by 5 out of 7 DOTs). The least 2 mentioned (3 out of 7 DOTs) were tracking and performance measures and training.

Table 8. Comparison of DRPs in the Seven State DOTs studied

Item	State DOT							
	CDOT	**Caltrans**	**FDOT**	**MDOT**	**MnDOT**	**ODOT**	**TxDOT**	**UDOT**
Documents analyzed	2022 standard specifications	2022 standard specifications	2023 standard specifications; FDOT's DRBs website	2022 standard specifications; Construction Manual (Claim procedure)	2020 standard specifications	2018 standard specifications	2014 standard specifications; 2021 Revised DR Procedure	2023 standard specifications
DRM used	DRB, mediation, arbitration	DRB, DRA, arbitration	DRB, RDRB	DRB	Mediation, arbitration	DRB, DRA, mediation, arbitration	DR panel, Standing DRB	DRB
Variations in DRP due to	claim size	project size, schedule	project size, complexity	project delivery method, project size, complexity	Mediation or Arbitration requested by contractor when all internal steps exhausted	project size	project size, project delivery method	
DRB	Used on all projects	on projects > 100 working days (DRB on project >3 million and DRA < 3 million)	DRB for projects >$50 million RDRB for projects<$ 50 million	Used on higher risk projects		DRB used on larger project while DRA on smaller projects	on DB projects -DR panel used DRB (regional) used on every project	Used as part of the partnering process
Partnering	Partnering guidelines, Project First (CDOT & CCA), Partnering special provisions	Construction partnering steering committee for all, and formal mandatory for projects > $1 million	Formal partnering on larger projects, but principles apply on smaller ones		Formal and informal partnering	Partnering on every project and is where most disputes are resolved	Facilitated Partnering used on larger projects	Field partnering guide, independent facilitator on larger projects. In-house facilitation on smaller ones

Item	State DOT							
	CDOT	**Caltrans**	**FDOT**	**MDOT**	**MnDOT**	**ODOT**	**TxDOT**	**UDOT**
Tracking	Area engineer tracks it	Project and district level	DRBF tracks some	None reported	Spreadsheet with chief counsel to keep track of all claims that come through the department		No specific tracking system, but construction division keeps track of number of claims	None but considered a good point to look into
Magnitude and number of disputes (5 years)	$32 million 35 claims *Not provided yet*	$1- $5 million 76-100 claims 5 to 10 % move to last stage	>$25 million 26-50 claims 10% move to final stage	$25-$75 million. 21-25 claims 70% disputes resolved at PM level, 20-25%, with DRB, and 5% through arbitration	None shared/ available Disputes rarely escalates beyond resident engineer.	$1- $5 million 50 claims 5-10 % moved to highest level. Average of 1.5 cases go to Court of Claims.	11 claims. Other info not shared/ available	5-10 claim to the CRB Other info not shared/ available
Duration of dispute in the last 5 years	~9 months	Range from 6 to 11 months	Range from 6 to 11 months.	Range from 7 to 8 months (can go up to 1 or 2 years)	Averages to 6 months (highly variable and dependent on a case-by-case basis)	Range from 6 to 11 months	Not shared/ available	Not shared/ available
Lessons Learned	No formal process; based on team's discretion.		Meeting with regional construction contractors, and consultants who lead the transportation committee			After-action review conducted for every project, includes claims and disputes, to document lessons learned & disseminate them through training		

Table 9. Comparison of main themes for a successful DRP in the Seven State DOTs studied

Theme	**CDOT**	**Caltrans**	**FDOT**	**MDOT**	**MnDOT**	**ODOT**	**TxDOT**	**UDOT**	***Frequency reported***
		State DOT							
1: Adhering to the process/contract	√	√	√		√		√	√	**5**
2: Partnering	√	√	√		√	√	√	√	**6**
3: Dispute Review Boards	√	√	√			√	√		**4**
4: Communication with stakeholders/ industry		√	√		√	√	√	√	**6**
5: Tracking and performance measures	√	√				√	√		**3**
6: Level of dispute resolution	√	√		√	√	√	√		**5**
7: Training		√			√		√		**3**

4 DRP Effectiveness Measures & Recommendations to CDOT

This section starts by detailing the effectiveness measures results based on the study conducted. Based on the identified effectiveness measures resulting from the survey and interview analysis, the research team will present proposed recommendations to CDOT's existing DRP.

4.1 Rationale for Effectiveness Measures Selected

The research team started the project with hypotheses on potential DRB effectiveness measures based primarily on literature reviewed. Both the surveys and the interview instruments were then developed based on these proposed measures. These measures included both quantitative and qualitative measures as listed in Table 10. The team sought to collect quantitative data on disputes from various DOTs and correlate them with the effectiveness of the process and thus determine the significant effectiveness measures. However, as more data was being collected, it was realized that most State DOTs do not track their claims and disputes, or if tracked, they are not tracked in a consistent manner to allow for such an analysis.

Table 10. Potential DRP effectiveness measures and thematic analysis results

Proposed Effectiveness Measure	Propositions	Thematic analysis	Decision (Y/N/S)
Quantitative			
Magnitude of the disputes ($)	Size of dispute affect DRP	Not a recurring theme	N
No. of disputes	Number of disputes affect DRP	Not a recurring theme	N
Cost of the DRP ($)	Cost of dispute affect DRP	Not a recurring theme	N
Time to resolution	Time to resolution affect DRP	A recurring theme (5 out of 7 DOTs)	Y
Level at which dispute is resolved	Level at which the dispute is resolved affect the DRP	A recurring theme (6 out of 7 DOTs)	Y
Qualitative			
Level of fairness	A more effective DRP is one that is perceived as fair	Not a recurring theme but it is supported by use of partnering and communication which are recurring themes	S
Level of satisfaction	A more effective DRP is one where the parties are satisfied		
Tracking process			
Formal vs. Informal	Having a formal/informal tracking process at various levels of the organization affect the DRP	Most DOTs didn't have a consistent tracking method, but some tracked certain elements. This measure is supported by the performance metrics which is a recurring theme (3 out of 7 DOTs)	S
Tracking levels (HQ, District, project.)			
Stakeholders vs. DOT measures	Stakeholders have different measures of effectiveness compared to DOTs	Not a recurring theme from contractors & consultants' interviews	N

Y: Yes; N: No; S: Supported by another measure

The team did conduct inferential analysis on the data collected from the surveys, yet no meaningful correlations between the DRP and these measures were identified (detailed in Section 3.2.5). Thus, the data inconsistency and unavailability hindered a thorough quantitative analysis.

However, based on the data collected from the interviews and the thematic analysis conducted, the team identified some measures as being appropriate DRP effectiveness measures. Table 10 lists the proposed effectiveness measures, the proposition statement, whether it emerged as a recurring theme, and the final decision to include, not to include, or to support by another measure. For example, one of the team propositions of what constitutes an effectiveness measure was the cost of the DRP, however, based on the interviews conducted (as well as supporting data from the surveys), it was seen that the cost of resolving the dispute was not a determining factor for the success of the process; in fact, it was not even tracked by DOTs. Accordingly, this proposed effectiveness measure was ruled out as it did not emerge as a recurring measure from the analysis (whether using the survey quantitative or the interview thematic analysis).

4.2 Effectiveness measures

This section describes the effectiveness measures determined by the research team based on the thematic analysis of the data collected. The effectiveness measures were divided into two main categories: primary and ancillary measures.

4.2.1 Primary measures

These measures stemmed from both the surveys and interviews respondents and were cited by more than three of the seven state DOTs analyzed. The measures are listed together with proposed ways in which an organization can assess its DRP effectiveness.

1. Fostering team working relationships– Are there mechanisms in place to foster the relationships between the project team members? These could encompass formal or informal partnering (stems from Theme 2).
2. Consistent industry involvement – Are there consistent mechanisms (e.g., contractor association meetings) to coordinate and receive feedback from the industry? (stems from Theme 4)
3. DRP adherence – Are team members following the process stipulated in the specifications, including timelines and submission of required documentation? (stems from Theme 1)
4. Resolving disputes at the lowest possible level – Are most disputes resolved at the lowest (project) level possible? (stems from Theme 6)
5. Time to resolve dispute – How much time is taken to resolve the dispute? The average from the data collected was around 6-8 months but is highly variable based on dispute type and level where it was resolved. This measure thus could be tied to the level at which the dispute is resolved and adherence to the contract timelines.
6. Availability of DRMs to supplement regular claim processes – Are there mechanisms stipulated in the contract that allow for third party involvement (e.g., DRB or Mediation) to resolve the dispute? (stems from Theme 3)

4.2.2 Ancillary measures

Ancillary measures stemmed from both the surveys and interviews respondents and were cited by less than three of the seven state DOTs analyzed.

1. Performance metrics and tracking – Does the organization have a system in place to track and measure DRP performance/effectiveness? (stems from Theme 5)

2. Training – Is there consistent training in place to educate project teams on the DRP? (stems from Theme 7)

4.3 Recommendations to CDOT

Considering the effectiveness measures and the comparative analysis between CDOT and other State DOTs, Table 11 provides the summary recommendations that aims to highlight the strengths of the existing CDOT DRP and aspects that could be further enhanced, and to provide suggestions for improvements to the DRP. Pertinent practices from other DOTs are also provided as reference examples.

Table 11. Recommendations summary and relevant examples

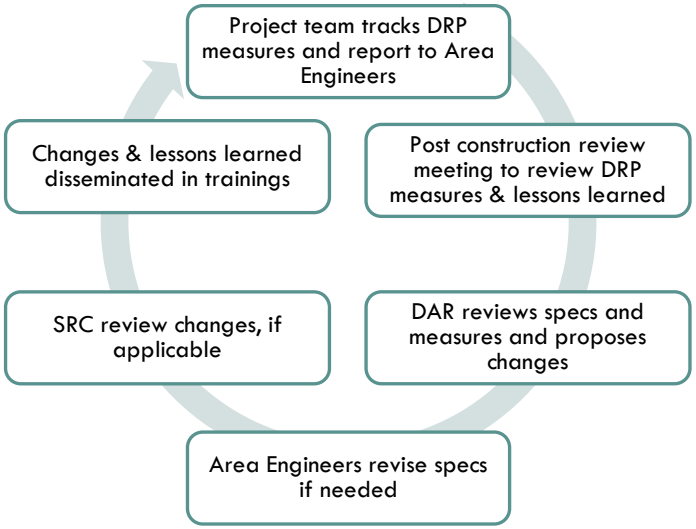
Effectiveness Criteria	Observations and Questions	Recommendations Proposed revisions to DRP and/or current practices
1. **Fostering working relationships at the project level**	1. Good partnering program is in place, but how effectively is it being implemented? 2. CDOT Partnering Field Guide 2006 – does it need to be updated (with industry input as well)? 3. Partnering separated from DRP? Two escalation ladders; one in DRP and one in Project First. Partnering escalation ladder – how does it relate (if at all) to dispute escalation process? 4. Descriptors used in Project First under the escalation ladder are unusual (e.g., defiance, etc.)? DOT Examples 1. Ohio DOT has partnering listed at the start of its DRP in its specs. 2. UDOT references best partnering practices as part of its DRP in its specs. 3. UDOT and MnDOT have partnering field guides – similar to CDOT's.	Potential Early Action Items ***1.*** Further enhance Project First with consistent implementation and more project team involvement in the process. Social events would be also encouraged to bring a human element to the relationships of CDOT and the contractors beyond the project daily procedures. Future Implementation Items ***2.*** Recognizing the significant importance of CDOT's existing partnering strategies (Project First) in ensuring the effectiveness of the DRP, it is recommended to review and establish the key purposes(s) of Project First in relation to dispute avoidance and resolution. ***3.*** Consider expanding the *Project First* document in light of the 2006 Partnering Field Guide, and update the descriptors stated to foster partnering approach and set up positive contractual relationships. ***4.*** Consider coordinating the partnering ladder with the DRP ladder and matching the language used in both (this is while noting that Project First is not limited to the DRP but to overall project goals). ***5.*** Develop a form of tracking for the partnering process and ensure it is being implemented.

Effectiveness Criteria	Observations and Questions	Recommendations Proposed revisions to DRP and/or current practices
2. **Resolving disputes at the lowest possible project level** ***3.*** **Time to resolve dispute** ***4.*** **DRP adherence**	1. The only recent change in the revised DRP specification is the deletion of arbitration as a dispute resolution method. 2. CDOT's process has the most number of steps compared to all DOTs studied (includes multiple steps and layers). 3. CDOT's process also includes differing submission requirements at different stages and levels. 4. Authority of staff to make decisions might affect how many disputes escalate to the next step in the ladder, and, as a result, impact overall DRP efficiency.	Future Implementation Items ***1.*** Recommended to review the DRP for efficiency (time reduction and redundancy removals). Steps and levels could be reduced. It is important though not to miss on the role of middle management in the process while reviewing it. Such revisions could include: ○ Times (durations) at each step should be reasonable and trackable. Need to re-look at the durations in the DRP flowchart ○ In particular, Regional Transportation Director and Chief Engineer loops after DRB should be reviewed ○ Revisit current certification of claim at higher level, rather than earlier in process ○ The process could be tailored/scaled based on the size of the project (CDOT currently has a devoted claim mitigation staff on larger projects, not on lower/middle level projects) ***2.*** CDOT should rely on project level personnel in the DRP to effectively avoid and resolve disputes at that level, preferably without having to resort to third party involvement (DRB) or elevating disputes to the RTD or Chief Engineer levels. However, the project personnel authority at various levels in terms of making decisions and their degree of authority, should be reviewed to ensure there is not a mismatch between the process and possibility of decisions being made at that level—a "mismatch" could ultimately force a decision to higher levels rather than resolving it at lower levels. For example:

Effectiveness Criteria	Observations and Questions	Recommendations Proposed revisions to DRP and/or current practices
		○ It is noted that the authority level for making decisions at project level is relatively low, which could be why it escalates pretty quicky to RTD (even for change orders). ○ The Project Engineer is acting on behalf of Chief (in their job description), yet they are limited in their dollar amounts authority, thus forcing the dispute to go up the chain. Is the limited authority project team role meant to set the dispute up with communication/documentation to the next level to make decisions? If RTD is the one having that authority, why are they at a higher level in the escalation process? Review the DRP to coordinate it with appropriate authority levels and make adjustments as needed to the DRP to reflect the reality of decision-making levels. ***3.*** Consider including the lower-level personnel in higher level meetings/communications to ensure that the dispute details are not lost.
5. **Availability and enhancement of the DRMs to supplement regular claim processes.**	1. The team received lots of feedback about DRB usage from CDOT staff and stakeholders such as: ○ The DRB process should be "more binding" to instill respect for the recommendations and reduce further escalation. In other words, the DRB process should not be a means to an end but instead be a major milestone that is extremely hard to reject; rejecting the DRB recommendation should be discouraged by different means.	Potential Early Action Items 1. Arbitration/litigation data should be tracked within the existing tracking process in order to include the entire DRP ladder (noting that arbitration has recently been removed from the CDOT DRP). 2. Tracking and educating staff on the actual dispute and claim numbers would be valuable to clarify misperceptions about the effectiveness of the DRB process. There is a report on the DRB

Effectiveness Criteria	Observations and Questions	Recommendations Proposed revisions to DRP and/or current practices
	○ Consistent and better training for DRB members. ○ Enhance the DRB members pool with more rigorous requirement for selection. 2. Notwithstanding the feedback on the DRB process, the study team observed that most DRB recommendations were accepted. 3. Arbitration/litigation data was not included in the tracking sheets. 4. Training was listed in the specifications for DRB members; however, it was not referenced by the interviewees. is it applied still? *105.23. CDOT, in conjunction with the Colorado Contractors Association, will maintain a statewide list of pre-approved DRB candidates experienced in construction processes and the interpretation of contract documents and the resolution of construction disputes. Only individuals who have completed training (currently titled DRB Administration and Practice Training) through the Dispute Resolution Board Foundation or otherwise approved by CDOT can be a DRB member. DRB nominees shall be selected from the list of pre-approved candidates.* 5. What criteria are CDOT/CCA currently using for approval of members on the DRB list? DOT Examples 1. Caltrans maintains training and education, with yearly DRB training to keep everyone up to date.	findings that is shared via emails with CDOT staff. 3. A strict disclosure process should be in place to prevent any bias of a DRB member (form signed and training emphasis). CDOT could consider being more forceful about this requirement. Future Implementation Items 1. The existing process for DRB members selection, including required training, should be reviewed. Formalized training should be enforced as a qualification requirement to be nominated by either party. Partner with CCA to review the existing process both in specs and in practice, and to review the existing DRB members prequal requirements and the current approved list (including members' reapplications and mandated periodical training programs). Consider including out-of-state DRB members for a wider pool. 2. Dispute Review Advisor (DRA) option could be added, based on the project cost rather than based on the dispute amount and in addition to the on-call DRB option. The process while being reviewed could incorporate and streamline this option (project DRA) and review the use of the on-call DRB process. 3. Mediation option should be reviewed so that usage and process to implement as part of the DRP is clear.

Effectiveness Criteria	Observations and Questions	Recommendations Proposed revisions to DRP and/or current practices
	2. FDOT holds monthly DRB meetings (typical regular DRB meetings are about three months nationally). Larger projects more than $50 million contract amount, have project specific DRBs, while smaller projects under $50 million are served by a standing regional DRB. 3. FDOT: As opposed to each party selecting its own DRB member (can lead to bias and same people being selected repeatedly), joint selection is now being recommended as best practice by DRBF. 4. FDOT is creating its own precedent based on DRB interpretations, even though DRB decisions are technically non-binding.	
***6.* Good contract documents**	1. Clarity in contract documents can help avoid disputes 2. If you get multiple claims in a certain specification over multiple projects, it could be an interpretation issue. DOT Example TxDOT- Improving specifications can prevent disputes. For example, a specification detailing the time of impact analysis method to be used for delay analysis helped prevent disputes in this area.	Future Implementation Items *1.* Specifications Review Committee could have a Disputes Avoidance Review (DAR) Subcommittee that can review the existing specifications in general, as well as any new specification language for potential disputes. Based on the on-going tracking conducted and feedback loop from the Area Engineers, continue to advise on upfront dispute avoidance issues. *2.* The overall DRP, tracking, and training could be designed as a feedback loop as shown in Figure 24: ○ Disputes are tracked with root cause of the problem – by project teams and the RTDs ○ Post construction review meeting includes review and documentation of disputes and claims that evolved – by Project Teams ○ Review for potential disputes in future projects and proposed revisions – by DAR

Effectiveness Criteria	Observations and Questions	Recommendations Proposed revisions to DRP and/or current practices
		○ Front end specs and technical specs reviewed accordingly if needed – by Area Engineers ○ Specification change go to the SRC - by Specifications Review Committee (SRC) ○ Changes in specs, issues, disputes, and claims that emerged and/or were documented in the post construction review, as well as in the tracking dashboard, are consistently updated in training programs.  *Figure 24: DRP Tracking, and Training Cycle* *3.* More specifically, review disputes/claims specifications for confirmation that they clearly express CDOT's intent regarding the merits, time aspects, and quantum of allowable claims under the contract.

Effectiveness Criteria	Observations and Questions	Recommendations Proposed revisions to DRP and/or current practices
7. **Clarity of organizational roles and responsibilities**	1. As noted above, there are questions about the coordination of the DRP steps/level with the actual roles and responsibilities of personnel in the DRP. 2. Most companies that CDOT work with have 2-3 levels in implementing the DRP, while CDOT has 6 steps. This could be confusing and ineffective from the construction company's perspective. DOT Examples UDOT develops a roles and responsibilities table for each project that outlines the key people involved and their roles and responsibilities to ensure that the project team is aware of their responsibilities and can communicate effectively to prevent disputes from arising.	Future Implementation Items 1. Review of the DRP (recommended above) should include the review of the DRP designated personnel and their roles, responsibilities, and authority to match them effectively with the DRP (who should be involved and what should be being communicated at what level?). Simplifying the DRP would facilitate personnel workflow and help clarify their roles and responsibilities in the DRP. 2. The organizational roles and responsibilities should be clearly communicated at both the project and programmatic levels, as they relate to implementation of the DRP. For example, the CDOT Construction Manual and other materials shared within CDOT and its stakeholders could include such DRP organizational roles and responsibilities. 3. Given the observed disconnect within the hierarchal structure of DRP authority, as between CDOT and its contractors, revising the process to shrink and reduce the steps (as detailed in previous recommendations) will better match the hierarchical chain of authority and thus reduce implementation inefficiencies and redundancies (as between the counterparty organizations).
8. **Tracking** ***9.*** **Performance metrics**	1. On comparing CDOT existing tracking process to the ones the team was able to retrieve from other DOTs (such as Caltrans or FDOTs), it was evident that CDOT's process includes higher levels of details that should be continuously maintained and can ultimately help establish performance metrics for its DRP.	Future Implementation Items ***1.*** CDOT should consider establishing the DRP effectiveness measures it wishes to implement (in light of the proposed measures from the study). ***2.*** The existing tracking system should be updated (including items to be tracked) to correspond with established DRP performance measures

Effectiveness Criteria	Observations and Questions	Recommendations Proposed revisions to DRP and/or current practices
	2. Data being tracked is great, but it is not tied to specific performance measures. Data tracked are required by internal or external policies, but it currently does not include enough analytics to help measure effectiveness. 3. There were no established DRP-specific performance metrics. 4. Most of CDOT's staff are not sure how and where the DRP data is being tracked Example DOTs Few DOTs in the survey (4 of the 17) pool established DRP performance criteria and a tracking system for it, so no examples are cited. However, multiple DOTs and stakeholders' interviewees stated that having such a metric would help inform and improve the process.	***3.*** Tracking program should be updated accordingly, and implemented and maintained. A dashboard (including the industry metrics referred to above) could be developed, updated consistently, and shared within CDOT and with the industry (as applicable).
10. **Training**	1. DRP implementation should include project team (contractor and owner) training and education on the DRP. 2. This theme did not emerge from the CDOT detailed study and therefore it is recommended to be further considered. DOT Examples 1. ODOT includes an 'after-action' review for every project that includes discussions of claims and disputes that evolved, and documents lessons learned and disseminate them through training (that is, change to the existing process).	Potential Early Action Items *1.* Training program should be set up for Project Engineers regarding CDOT DRP. DRP module could be included in already existing processes, such as the post construction review, in order to incorporate it into process improvements. *2.* These post construction review meetings could also act as a feedback loop where the project team can review the actual implemented DRP, issues that came up, what went well, what could be done better, document the lessons learned, and disseminate them in trainings.

Effectiveness Criteria	Observations and Questions	Recommendations Proposed revisions to DRP and/or current practices
	2. Caltrans maintains education to project personnel by conducting academy sessions on the DRP. 3. TxDOT includes holding mock dispute meetings to teach dispute resolution techniques and help stakeholders practice resolving disputes in a controlled environment.	Future Implementation Items *3.* Potential training programs for project teams (include the stakeholders): ○ Extensive current training with Project First, to include the DRP as well. ○ Adding module on DRP to any existing training implemented with CDOT and with the industry's cooperation and buy-in. ○ Training format could be offered using different modalities (in-person, virtual, or hybrid) ○ Review the existing CM manual to update the DRP, as per recommendations above and add a module on DRP (if not included) (last updated 2022).
***11.* Industry involvement**	1. In addition to project specific partnering efforts, fostering a partnering relationship with industry partners increases support of the DRP from contractors and allows for feedback loops for improvements, as needed. 2. Good recurring meetings with CCA but how much is being covered in depth? Currently CDOT holds bi-monthly meetings with CCA and all other industry partners are welcome. CCA also has a seat on the specifications committee where they review changes and initiatives. There was a CDOT-Industry task force when the Project First initiative started. DOT Examples 1. Caltrans Partnering Steering Committee has been effective in helping industry and Caltrans come	Future Implementation Items 1. Establish a partnering framework aside from project-based ones, such as a CDOT-Industry steering committee or a task force that would: ○ Mirror the process that existed at the initiation of Project First ○ Focus on the entire DRP and Project First (and the connection between them) and looks at improvements to the process in light of the recommendations that came from this study ○ Meet consistently with a specific objective for its work product ○ Could include CDOT Executives, Chief Engineer, RTDs from 5 regions, representatives from CCA, WCCA, and other companies that complete work for CDOT, and any other key stakeholders in the Industry

Effectiveness Criteria	Observations and Questions	Recommendations Proposed revisions to DRP and/or current practices
	together to understand each other's needs and concerns. 2. Institutional partnering programs are also implemented by ODOT and FDOT. 3. ODOT holds regular meetings with regional construction contractors and consultants (OCA and ODOT). 4. FDOT has various committees and groups within the organization that interact with contractors to gather feedback on the DRP and identify improvement areas; this feedback is taken seriously to ensure that the DRP continues to function effectively for all parties involved.	○ Could establish performance metrics to be used in light of the ones developed from this study. This could include industry level metrics (shared externally), as well as CDOT-specific DRP metrics that are pertinent to evaluating the DRP internally. Area engineers could track and provide the DRP performance numbers that the steering committee or task force will evaluate.

5 LIMITATIONS & FUTURE RECOMMENDATIONS

The objective of this study was to conduct a detailed review of Colorado's DRP and provide suggestions for improvement to CDOT's DRP. To achieve this objective, the research team collected and analyzed data from CDOT, as well as other DOTs nationwide, including content analysis of all State DOTs' DRP specification documents, a survey administered to State DOT employees and their stakeholders (contractors and consultants), and finally, detailed analysis of seven DOTs that supplemented the data collected and included interviews of DOT employees involved in the DOT DRP, as well as contractors and consultants. Section 4 included the major findings of the study which identified the primary and ancillary measures that affect the DRP. It also included recommendations to CDOT on how to improve its existing DRP.

5.1 Limitations

It is important to note the limitations of the research study conducted. The content analysis did capture the entire DOT processes as stipulated in their standard specifications. However, the survey response rate was limited to 16 State DOTs, which is a representative sample of the DOT population, however, does not include all DOTs' perceptions and practices. Statutory requirements that might limit or hinder the use of certain processes or methods were not addressed in this study. Stakeholders, specifically contractors' interviews in both CDOT and other state DOTs, were the most challenging to set up compared to the DOT interviews overall.

5.2 Recommendations for Future Studies and Work

Results from the study clearly show that across DOTs there is not a consistent method of tracking claims and disputes (at various levels), which does not allow for proper assessment of DRPs performance. It is thus recommended to develop a standardized method of tracking disputes that would allow for better assessment of the process, as well as comparisons of what processes and methods work better in certain systems (large or smaller DOT), under certain constraints (statutory requirements), and using different delivery methods (e.g., DB, CMGC, and PPPs).

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APPENDIX A – CDOT DRP FLOWCHART

Excerpt from Revision of Sections 105: DISPUTE REVIEW BOARD AND CLAIMS FOR UNRESOLVED DISPUTES

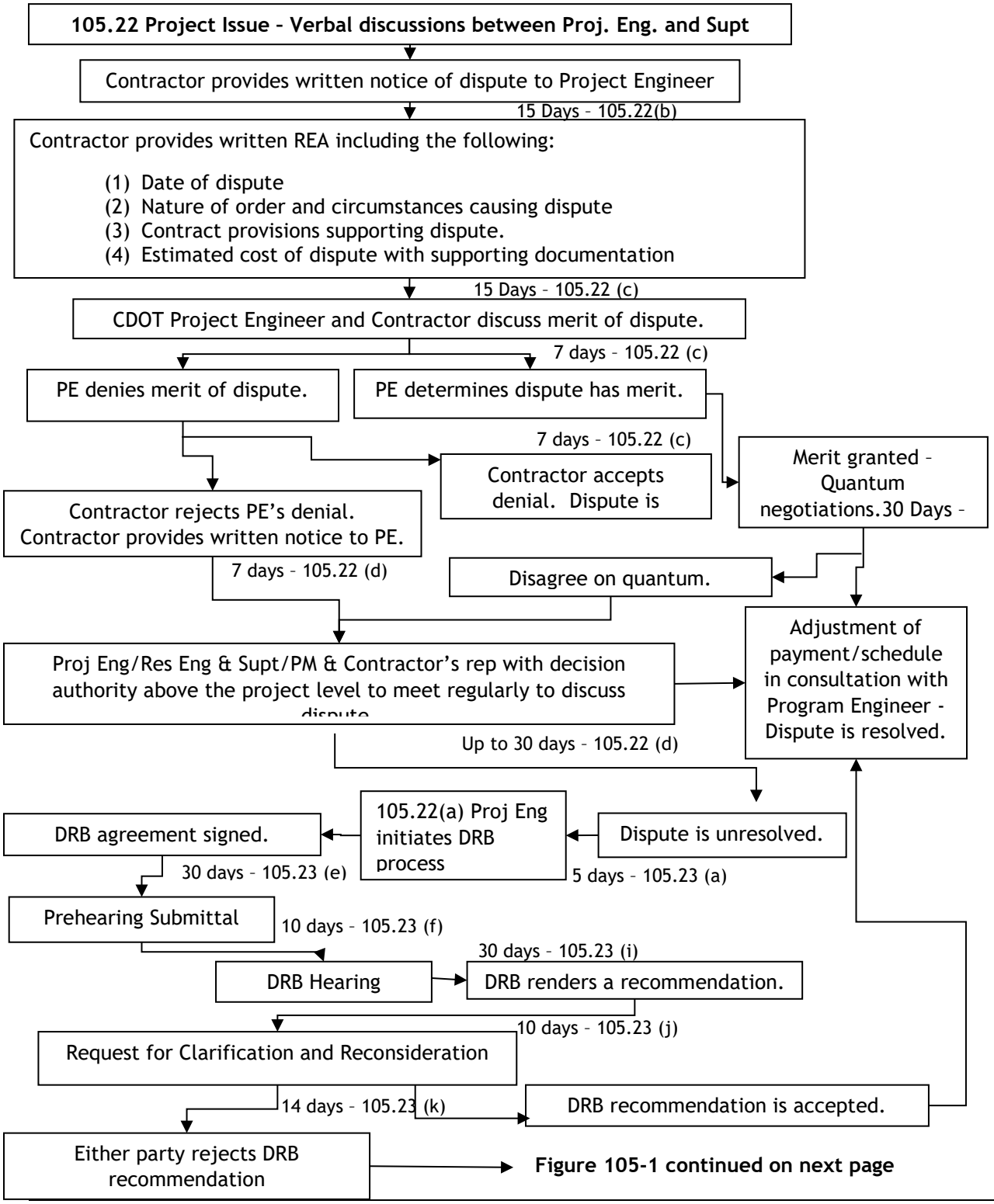
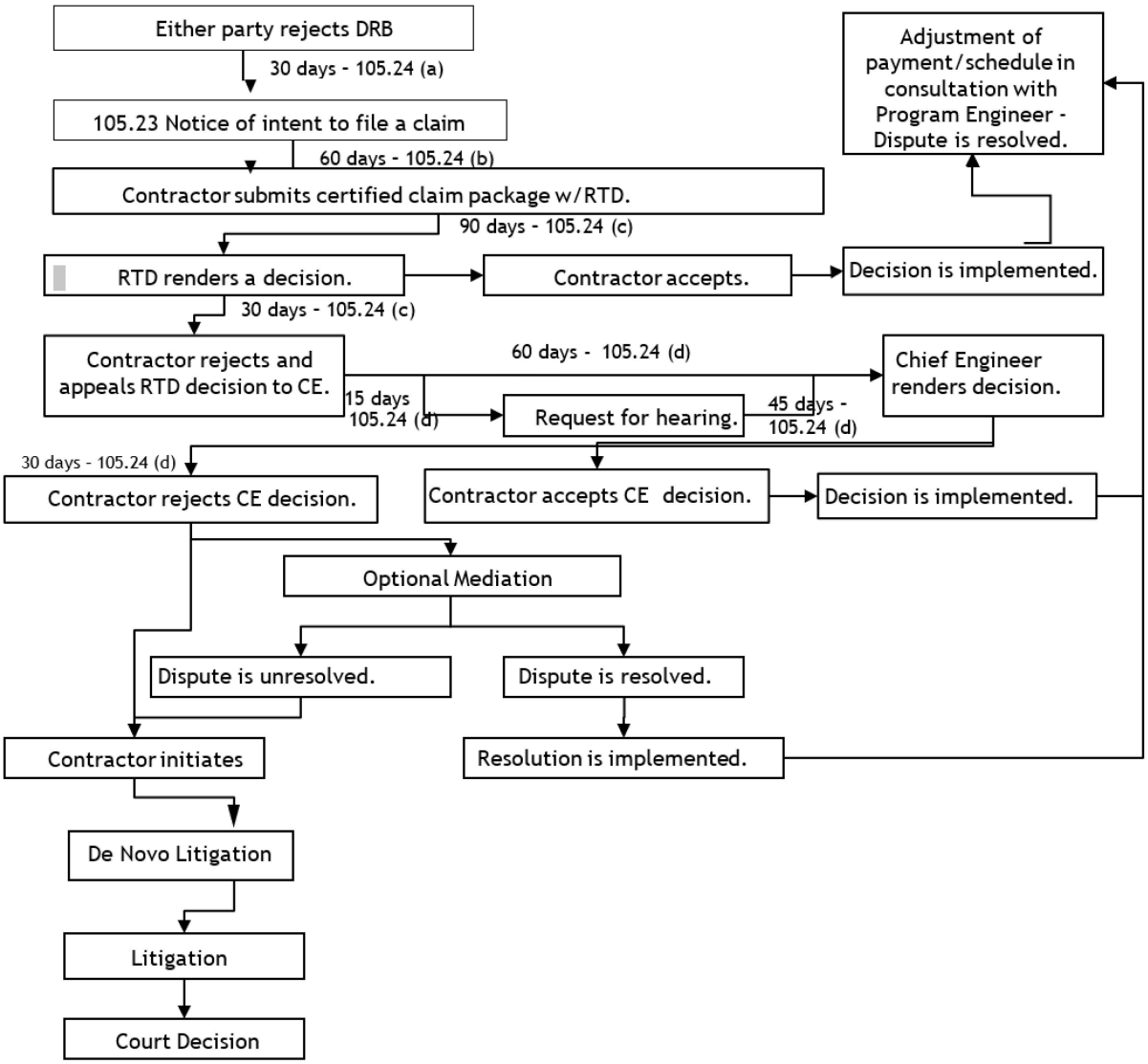


Figure 105-1 continued on next page

Figure 105-1
(continued)



APPENDIX B – SURVEY

DOTs Version - Transportation Dispute Resolution Process Review Survey

Transportation Dispute Resolution Process Review
A Colorado Department of Transportation Sponsored Project

Introduction

You have been asked to participate in this research study. It is important that you read and understand the following explanation of the procedures involved before you agree to participate. If you have any questions, feel free to contact the investigators: *Dr. Mohammed Hashem M. Mehany – (970) 491-7963, or Dr. Ghada Gad - (909) 869-2648.*

Purpose

This questionnaire is conducted as part of a **Colorado Department of Transportation (CDOT) sponsored research project** to assess the use of dispute resolution processes (DRPs) by State DOTs. The questionnaire requests information regarding three key areas regarding your experience with the DRP. These include (1) the DRP being employed, (2) the effectiveness of the process in avoiding/resolving disputes, (3) the satisfaction level of the DOTs and their stakeholders with the DRP.

Please answer the questions regarding your organization practices if you are in an executive role, or regarding projects that you have worked on or managed if you currently lead or administer projects, to the best of your ability.

Length of Participation

The questionnaire will take 15-20 minutes of your time to complete.

Risks

There are no known risks to you as a result of participating in this study. This study has been reviewed and will be approved by Cal Poly Pomona, Institutional Review Board (IRB). The interview is voluntary and participants have a choice not to answer a particular question if he/she does not wish to do so. The survey data will be anonymous and there will be no identification of your participation to your employer or anybody else. You may decline to answer any or all questions and you may terminate your involvement at any time you choose.

Confidentiality

The survey data will be anonymous and there will be no identification of your participation which can be traced back to you by your employer or anybody else. In published reports, there will be no information included that will make it possible to identify you. Research records will be

stored securely and only approved researchers will have access to the records.

Benefits
It is expected that this study would help in the development of the dispute resolution process of CDOT. We will be happy to share the study results when available, so please indicate your interest and include your contact information in the final question.

Consent to Participate
I have read and understood the information in this form. I have been encouraged to ask questions and all of my questions have been answered satisfactorily. By responding to this email, I agree to participate in this study. I understand that I can request a copy of this form for my own records.

Contacts and Questions: If you have any concerns or complaints about this research, please contact either

Dr. Ghada Gad at gmgad@cpp.edu or (909) 869-2648.
OR
Dr. Mohammed Hashem M. Mehany at MSH@colostate.edu or (970) 491-7963

○ I understand and I wish to take the survey (1)

○ I decline to take the survey (2)

Skip To: End of Survey If Transportation Sponso... Transportation Dispute Resolution Process Review A Colorado Department of I decline to take the survey

End of Block: Consent

Start of Block: Background Information

For consistency, please use the definitions below as you answer the questions:

Change Orders: Changes to the contract document that may be agreed upon, or could further move to become a claim if the parties do not come to an agreement.

Disputes: When parties do not agree on an issue but have not formally submitted a claim to document it. A dispute could develop into a claim.

Claims: When change orders are not resolved, parties would submit this formal document to present their argument and request time or cost compensation or other contract changes.

Dispute Resolution Process (DRP): It is the overall process of resolving disputes between parties which is triggered when disputes move to a formal written claim that was not resolved at a prior level (becomes a claim).

Dispute Resolution Ladder: As part of DRP, this represents the escalation of the resolution of the dispute through the organization levels and/or other dispute methods (for example from project level, to mediation, to DRB, and then to litigation).

Feel free to explain below if your organization uses different definitions for any of the terms above:

_____

_____

_____

_____

_____

Page Break

Q In which state is your organization?

▼ Alabama (1) ... I do not reside in the United States (53)

Q3 Tell us about your organization:

○ Name of the organization (1) _____

○ Location (City) (2) _____

Q What is your primary role/job title in your institution?

○ Project Management (project level) (1)

○ Project Management (executive level) (2)

○ Design, please specify area in the text box below (3) _____

○ Procurement and Contracts (4)

○ Change management or dispute resolution, please specify role in the text box below (5) _____

○ Others, please specify in the text box below (6) _____

Q How many years of experience do you have (or have been involved) in Dispute Resolution?

- ○ Less than 1 year (1)
- ○ 1 - 5 years (2)
- ○ 6 - 10 years (3)
- ○ 11 - 20 years (4)
- ○ More than 20 years (5)

End of Block: Background Information

Start of Block: Dispute Resolution Process (DRP)

Q How do you define a "dispute" in your organization?

_____

_____

_____

_____

_____

Q What triggers the Dispute Resolution Process (DRP)? *This is not to be confused with a change order or site office disagreements.*

_____

_____

_____

_____

_____

Q Which of these are part of the Dispute Resolution Process (DRP) in your DOT? - **check <u>all</u> that apply**

- ☐ Partnering
- ☐ Negotiation
- ☐ Mediation
- ☐ Dispute Review Board *Please include the specification document's link in the text box below* _____
- ☐ Litigation
- ☐ Arbitration
- ☐ Other please specify

Q Has your Dispute Resolution Process (DRP) been changed/revised in the past 10 years?

- ○ Yes (1)
- ○ No (2)

Display This Question:

If Has your Dispute Resolution Process (DRP) been changed/revised in the past 10 years? Yes

Q. When was the last time your DRP was changed or revised?

_____

Q What are the steps of escalation in your DRP?
*Please **write ALL your steps and then click on their left to rank them** in the order they would occur until it escalates to arbitration and/or Litigation (for example: 1- Partnering, 2- Mediation, 3- DRB, 4- Litigation)*
_____ Click in the text box to write step 1 (1)
_____ Click in the text box to write step 2 (2)
_____ Click in the text box to write step 3 (3)
_____ Click in the text box to write step 4 (4)
_____ Click in the text box to write step 5 (5)
_____ Click in the text box to write step 6 (6)
_____ Click in the text box to write step 7 (7)
_____ Click in the text box to write step 8 (8)
_____ Click in the text box to write step 9 (9)
_____ Click in the text box to write step 10 (10)

Q Do you have a different dispute resolution process (DRP) for different project delivery methods (PDMs) (e.g., Design-bid-build vs. Design-Build)

- ○ Yes (1)
- ○ No (2)
- ○ I don't know (3)

Display This Question:

If Do you have a different dispute resolution process (DRP) for different project delivery methods (... Yes

Q What is the difference between the DRP for various Project Delivery Methods (PDMs)?

_____

_____

_____

_____

_____

Display This Question:

If Do you have a different dispute resolution process (DRP) for different project delivery methods (... Yes

Q Please include the specification document's link or specification sections in the text box below:

_____

Page Break

Q Do you use proactive methods in your DRP, such as partnering or other?

- ○ Yes (1)
- ○ No (2)

Display This Question:

If Do you use proactive methods in your DRP, such as partnering or other? Yes

Q What are the proactive DRP you use? Please include the specification document link or name.

Enter the names of your proactive DRPs and the spec links in the text boxes

- ○ Click to write Choice 1 (1)

  _____

- ○ Click to write Choice 2 (2)

  _____

- ○ Click to write Choice 3 (3)

  _____

- ○ Click to write Choice 4 (4)

  _____

- ○ Click to write Choice 5 (5)

  _____

Page Break

Q Is the Dispute Resolution process (DRP) depicted in the standard specification always followed exactly on all projects?

- ☐ Yes (1)
- ☐ No, depends on Project Delivery Method used, please explain (2) _____
- ☐ No, depends on the size of the project, please explain (3) _____
- ☐ No, depends on work scope, please explain (4) _____
- ☐ No, other reasons, please explain (5) _____

End of Block: Dispute Resolution Process (DRP)

Start of Block: Dispute Resolution Process (DRP) Performance

Q In your experience, what is the average duration of a typical dispute to resolve?

- ○ Less than 6 months (1)
- ○ 6 - 11 months (2)
- ○ 1 to 2 years (3)
- ○ More than 2 years but less than 5 years (4)
- ○ 5 or more years (5)

Display This Question:

If If Which of these are part of the Dispute Resolution Process (DRP) in your DOT? check all that apply q://QID8/SelectedChoicesCount Is Greater Than 1

Q According to your own experience, what have been the best DRP(s) for resolving the disputes? ***Please rank them.***

____ Litigation (1)
_____ Aribitration (2)
_____ Mediation (3)
_____ Negotiation (4)
_____ Dispute Review Board (DRB) (5)
_____ Proactive (e.g., Partnering) (6)
_____ Others, please state and rank (7)

Q24 Is there a dollar amount limitation on when a particular DRP is used (e.g., $100k vs $1 million Dispute)?

- ○ Yes (1)
- ○ No (2)

Display This Question:

If Is there a dollar amount limitation on when a particular DRP is used (e.g., $100k vs $1 million D... Yes

Q Enter the dollar amount limitation for respective dispute resolution methods, in the text box below:

_____

_____

_____

_____

_____

Page Break

Q Do you track disputes that go through your DRP?

- ○ Yes, please state the method you use (4) _____
- ○ No (5)
- ○ I don't know (6)

Q What are the number of disputes that have been through your DOT DRP in the last 5 years?

- ○ None (1)
- ○ Less than 10 (2)
- ○ 11 - 25 (3)
- ○ 26 - 50 (4)
- ○ 51 - 75 (5)
- ○ 76 - 100 (6)
- ○ More than 100 (7)

Q What is the magnitude of the disputes that have been through your DOT DRP in the last 5 years?

- ○ Less than $1 mil (1)
- ○ $1 mil - $5 mil (2)
- ○ $5 mil - $10 mil (3)
- ○ $10 mil - $25 mil (4)
- ○ $25 mil - $75 mil (5)
- ○ $75 mil - $100 mil (6)
- ○ More than $100 mil (7)

Carry Forward All Choices Entered Text from "What are the steps of escalation in your DRP?Please write ALL your steps and then click on their left to rank them in the order they would occur (for example: Partnering, Mediation, DRB, Litigation)"

Q At what stage of DRP are most disputes resolved?

- ○ Click in the text box to write step 1 (1)
- ○ Click in the text box to write step 2 (2)
- ○ Click in the text box to write step 3 (3)
- ○ Click in the text box to write step 4 (4)
- ○ Click in the text box to write step 5 (5)
- ○ Click in the text box to write step 6 (6)
- ○ Click in the text box to write step 7 (7)
- ○ Click in the text box to write step 8 (8)
- ○ Click in the text box to write step 9 (9)
- ○ Click in the text box to write step 10 (10)

Q How many Disputes have gone to the final stage of the DRP (unresolved)?

- ○ Less than 5% (1)
- ○ 5% - 10% (2)
- ○ 10% - 25% (3)
- ○ 25% - 50% (4)
- ○ 50% - 75% (5)
- ○ More than 75% (6)

Q Overall, has the DRP reduced the number of disputes going to arbitration or litigation in the past five years?

- ○ Yes (1)
- ○ No (2)
- ○ I don't know (3)

End of Block: Dispute Resolution Process (DRP) Performance

Start of Block: Effectiveness of DRP

Q Do you measure the DRP effectiveness at your institution?

- ○ Yes (1)
- ○ No (2)
- ○ I don't know (3)

Display This Question:

If Do you measure the DRP effectiveness at your institution? Yes

Q How do you measure your DRP effectiveness? select all that apply

- ☐ Cost to resolve dispute, please explain (1) _____
- ☐ Time taken to resolve dispute, please explain (2) _____
- ☐ Stage at which dispute resolved, please explain (3) _____
- ☐ Level of satisfaction with resolution reached, please explain (4) _____
- ☐ Other measures, please explain (5) _____

Q What is the average out of pocket cost of the DRP? (e.g. Cost of DRB and litigation fees)

_____

Page Break

Q How do you perceive the level of fairness of the DRP?

- ○ Very fair (1)
- ○ Fair (2)
- ○ Neutral (3)
- ○ Unfair (4)
- ○ Extremely unfair (5)

Q How do you perceive the relationship between the parties after going through the DRP?

- ○ Worse and adversarial relationship (1)
- ○ Neutral (2)
- ○ Improved relationship (3)

Q How satisfied are you with the current DRP process?

- ○ Very satisfied (1)
- ○ Satisfied (2)
- ○ Neither satisfied nor dissatisfied (3)
- ○ Dissatisfied (4)
- ○ Very dissatisfied (5)

Q How satisfied are the stakeholders (e.g., contractors, consultants, etc.) with the current DRP?

- ○ Very satisfied (1)
- ○ Satisfied (2)
- ○ Neither satisfied nor dissatisfied (3)
- ○ Dissatisfied (4)
- ○ Very dissatisfied (5)

Q In your opinion, which project delivery method is more susceptible to disputes?

- ○ Design Bid Build (DBB) (1)
- ○ Design-Build (DB) (2)
- ○ Construction Manager at Risk or GC (CMAR/CMGC) (3)
- ○ Integrated Project Delivery (IPD) (4)
- ○ Public Private Partnership (PPP) (5)

Q Would you be interested to participate in a follow-up interview regarding this study?

- ○ Yes (1)
- ○ No (2)

Q Would you like us to share with you the findings from this study?

- ○ Yes (1)
- ○ No (2)

Display This Question:

If Would you be interested to participate in a follow up interview regarding this study? Yes

Or Would you like us to share with you the findings from this study? Yes

Q Please include below your contact information:

- ○ Name (1) _____
- ○ Title (2) _____
- ○ Organization (3) _____
- ○ Email (4) _____
- ○ Phone no. (5) _____

End of Block: Effectiveness of DRP

Stakeholders Version - Transportation Dispute Resolution Process Review Survey

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Start of Block: Consent

Transportation Dispute Resolution Process Review
A Colorado Department of Transportation Sponsored Project

Introduction
You have been asked to participate in this research study. It is important that you read and understand the following explanation of the procedures involved before you agree to participate. If you have any questions, feel free to contact the investigators: *Dr. Mohammed Hashem M. Mehany – (970) 491-7963, or Dr. Ghada Gad - (909) 869-2648.*

Purpose
This questionnaire is conducted as part of a Colorado Department of Transportation (CDOT) sponsored research project to assess the use of dispute resolution processes (DRPs) by other State DOTs. The questionnaire requests information regarding three key areas regarding your experience with the DRP. These include (1) the DRP being employed, (2) the effectiveness of the process in avoiding/resolving disputes, (3) the satisfaction level of the DOTs and their stakeholders with the DRP.

Please answer the questions regarding your organization practices if you are in an executive role, or regarding projects that you have worked on or managed if you currently lead or administer projects, to the best of your ability.

Length of Participation
The questionnaire will take 15-20 minutes of your time to complete.

Risks
There are no known risks to you as a result of participating in this study. This study has been reviewed and will be approved by Cal Poly Pomona, Institutional Review Board (IRB). The interview is voluntary and participants have a choice not to answer a particular question if he/she does not wish to do so. The survey data will be anonymous and there will be no identification of your participation to your employer or anybody else. You may decline to answer any or all questions and you may terminate your involvement at any time you choose.

Confidentiality
The survey data will be anonymous and there will be no identification of your participation which can be traced back to you by your employer or anybody else. In published reports, there will be no information included that will make it possible to identify your company or you. Research records will be stored securely and only approved researchers will have access to the records.

Benefits
It is expected that this study would help in the development of the dispute resolution process of CDOT. We will be happy to share the study results when available, **so please indicate your interest and include your contact information in the final question.**

Consent to Participate
I have read and understood the information in this form. I have been encouraged to ask questions and all of my questions have been answered satisfactorily. By responding to this email, I agree to participate in this study. I understand that I can request a copy of this form for my own records.

Contacts and Questions: If you have any concerns or complaints about this research, please contact either

Dr. Ghada Gad at gmgad@cpp.edu or (909) 869-2648.
OR
Dr. Mohammed Hashem M. Mehany at MSH@colostate.edu or (970) 491-7963

- ○ I understand and I wish to take the survey (1)
- ○ I decline to take the survey (2)

Skip To: End of Survey If Transportation Dispute Resolution Process Review A Colorado Department of Transportation Sponsore... I decline to take the survey

End of Block: Consent

Start of Block: Background Information

For **consistency,** please use the definitions below as you answer the questions:

Change Orders: Changes to the contract document that may be agreed upon, or could further move to become a claim if the parties do not come to an agreement.

Disputes: When parties do not agree on an issue but have not formally submitted a claim to document it. A dispute could develop into a claim.

Claims: When change orders are not resolved, parties would submit this formal document to present their argument and request time or cost compensation or other contract changes.

Dispute Resolution Process (DRP): It is the overall process of resolving disputes between parties which is triggered when disputes move to a formal written claim that was not resolved at a prior level (becomes a claim).

Dispute Resolution Ladder: As part of DRP, this represents the escalation of the resolution of the dispute through the organization levels and/or other dispute methods (for example from project level, to mediation, to DRB, and then to litigation).

Q What states does your firm operate in? *Please select all that apply.*

- ☐ Alabama (1)
- ☐ Alaska (2)
- ☐ Arizona (3)
- ☐ Arkansas (4)
- ☐ California (5)
- ☐ Colorado (6)
- ☐ Connecticut (7)
- ☐ Delaware (8)
- ☐ District of Columbia (9)
- ☐ Florida (10)
- ☐ Georgia (11)
- ☐ Hawaii (12)
- ☐ Idaho (13)
- ☐ Illinois (14)
- ☐ Indiana (15)
- ☐ Iowa (16)
- ☐ Kansas (17)
- ☐ Kentucky (18)

- [ ] Louisiana (19)
- [ ] Maine (20)
- [ ] Maryland (21)
- [ ] Massachusetts (22)
- [ ] Michigan (23)
- [ ] Minnesota (24)
- [ ] Mississippi (25)
- [ ] Missouri (26)
- [ ] Montana (27)
- [ ] Nebraska (28)
- [ ] Nevada (29)
- [ ] New Hampshire (30)
- [ ] New Jersey (31)
- [ ] New Mexico (32)
- [ ] New York (33)
- [ ] North Carolina (34)
- [ ] North Dakota (35)
- [ ] Ohio (36)

- [ ] Oklahoma (37)
- [ ] Oregon (38)
- [ ] Pennsylvania (39)
- [ ] Puerto Rico (40)
- [ ] Rhode Island (41)
- [ ] South Carolina (42)
- [ ] South Dakota (43)
- [ ] Tennessee (44)
- [ ] Texas (45)
- [ ] Utah (46)
- [ ] Vermont (47)
- [ ] Virginia (48)
- [ ] Washington (49)
- [ ] West Virginia (50)
- [ ] Wisconsin (51)
- [ ] Wyoming (52)
- [ ] I do not reside in the United States (53)

Q If your firm/company is working in different location, In which state are you currently working within your organization?

▼ Alabama (1) ... I do not reside in the United States (53)

Q Choose the discipline that best describes your organization's area of expertise:

- ○ Consultant (1)
- ○ Owner (2)
- ○ Contractor (3)
- ○ Design firm (4)
- ○ Third party dispute resolution member (such as DRB member, Mediator, and Arbitrator) (please specify in the text box) (5)

  _____

- ○ Other (please specify in the text box) (6)

  _____

Q What is your primary role/job title in your institution?

- ○ Project management (project level) (1)
- ○ Project management (executive level) (2)
- ○ Design, please specify area in the text box below (3)

  _____

- ○ Procurement and contracts (4)
- ○ Change management or dispute resolution, please specify role in the text box below (5)

  _____

- ○ Other, please specify in the text box below (6)

  _____

Q How many employees does your firm have?

- ○ 1 - 200 (1)
- ○ 201 - 500 (2)
- ○ 501 - 1000 (3)
- ○ 1001 - 2500 (4)
- ○ 2501 - 5000 (5)
- ○ > 5000 employees (6)

Q What is the annual revenue of your organization (in $)?

_____

Q How many years of experience do you have (or have been involved) in Dispute Resolution?

- ○ Less than 1 year (1)
- ○ 1 - 5 years (2)
- ○ 6 - 10 years (3)
- ○ 11 - 20 years (4)
- ○ More than 20 years (5)

End of Block: Background Information

Start of Block: Dispute Resolution Process (DRP)

Q What is the main Dispute Resolution Process (DRP) used by the DOTs you work with? - ***check all that apply***

- ☐ Litigation (1)
- ☐ Arbitration (2)
- ☐ Mediation (3)
- ☐ Partnering (4)
- ☐ Negotiation (5)
- ☐ Dispute Review Board (include the specification document's link in the text box below) (6) _____

Q Do you use proactive DRP, such as partnering or others?

- ○ Yes (1)
- ○ No (2)

Display This Question:

If Do you use proactive DRP, such as partnering or others? Yes

Q What are the proactive DRP do you use? Please include the specification document link.
Enter the names of your proactive DRPs and the spec links in the text boxes

- ○ Click to write Choice 1 (1)
  _____
- ○ Click to write Choice 2 (2)
  _____
- ○ Click to write Choice 3 (3)
  _____
- ○ Click to write Choice 4 (4)
  _____
- ○ Click to write Choice 5 (5)
  _____

End of Block: Dispute Resolution Process (DRP)

Start of Block: Dispute Resolution Process (DRP) Performance

Carry Forward All Choices Entered Text from "What are the steps of escalation in your DRP? Please rank them accordingly."

Q In the disputes you/your firm have been involved in, at what stage of DRP are most disputes resolved?

- ○ Click in the text box to write step 1 (1)
- ○ Click in the text box to write step 2 (2)
- ○ Click in the text box to write step 3 (3)
- ○ Click in the text box to write step 4 (4)
- ○ Click in the text box to write step 5 (5)
- ○ Click in the text box to write step 6 (6)
- ○ Click in the text box to write step 7 (7)
- ○ Click in the text box to write step 8 (8)
- ○ Click in the text box to write step 9 (9)
- ○ Click in the text box to write step 10 (10)

Q In your experience, what is the average duration of a typical dispute to resolve?

- ○ Less than 6 months (1)
- ○ 6 - 11 months (2)
- ○ 1 to 2 years (3)
- ○ More than 2 years but less than 5 years (4)
- ○ 5 or more years (5)

Display This Question:

If If What is the main Dispute Resolution Process (DRP) used by the DOTs you work with? check all that apply q://QID8/SelectedChoicesCount Is Greater Than 1

Q According to your experience, what have been the most effective DRP(s) for resolving the disputes you have been through? ***Please rank them.***

_____ Arbitration (1)
_____ Mediation (2)
_____ Negotiation (3)
_____ Dispute Review Board (DRB) (4)
_____ Proactive (e.g., Partnering) (5)

Q What are the number of disputes that you had with the DOT you work with in the last 5 years?

- ○ None (1)
- ○ Less than 10 (2)
- ○ 11 - 25 (3)
- ○ 26 - 50 (4)
- ○ 51 - 75 (5)
- ○ 76 - 100 (6)
- ○ More than 100 (7)

Q In your experience with the DOT you have worked with, what is the magnitude of the disputes that have been through their DRP in the last 5 years?

- ○ Less than 500 K
- ○ 500 to $1 mil (1)
- ○ $1 mil - $5 mil (2)
- ○ $5 mil - $10 mil (3)
- ○ $10 mil - $25 mil (4)
- ○ $25 mil - $75 mil (5)
- ○ $75 mil - $100 mil (6)
- ○ More than $100 mil (7)

Q In the disputes you/your firm have been involved in, how many disputes have gone to the final step of the dispute ladder (unresolved)?

- ○ Less than 10% (1)
- ○ 10% - 25% (2)
- ○ 25% - 50% (3)
- ○ 50% - 75% (4)
- ○ More than 75% (5)

Q Overall, has the DRP employed on the projects you worked on, reduced the number of disputes going to arbitration or litigation in the past five years?

- ○ Yes (1)
- ○ No (2)

End of Block: Dispute Resolution Process (DRP) Performance

Start of Block: Effectiveness of DRP

Q What is the average out of pocket cost of the DRP from your experience (e.g. Overall cost of DRB and litigation fees)?

_____

Q How do you perceive the level of fairness of the DRP you were involved in?

- ○ Very fair (1)
- ○ Fair (2)
- ○ Neutral (3)
- ○ Unfair, please explain in text box below (4)
- ○ Extremely unfair, please explain in text box below (5)

_____

Q How do you perceive the effect of the DRP on the relationship between the parties after they go through it?

- ○ Worse and adversarial relationship (1)
- ○ Not affected (2)
- ○ Improved relationship (3)

Q How satisfied are you with the current DRP employed by the DOT, on your projects?

- ○ Very satisfied (1)
- ○ Satisfied (2)
- ○ Neither satisfied nor dissatisfied (3)
- ○ Dissatisfied , please explain in text box below (4)
- ○ Very dissatisfied, please explain in text box below (5)

_____

Q In your opinion, what project delivery method is more susceptible to disputes? Please select NA if you don't have experience using this method.

- ○ Design Bid Build (DBB) (1)
- ○ Design-Build (DB) (2)
- ○ Construction Manager at Risk or GC (CMAR/CMGC) (3)
- ○ Integrated Project Delivery (IPD) (4)
- ○ Public Private Partnership (PPP) (5)
- ○ NA (6)

Q Would you be interested to participate in a follow-up interview regarding this study?

- ○ Yes (1)
- ○ No (2)

Q Would you like us to share with you the findings from this study?

- ○ Yes (1)
- ○ No (2)

Display This Question:

If Would you like us to share with you the findings from this study? Yes

Or Would you be interested to participate in a follow up interview regarding this study? Yes

Q Please include below your contact information:

- ○ Name (1) _____
- ○ Title (2) _____
- ○ Organization (3) _____
- ○ Email (4) _____
- ○ Phone no. (5) _____

End of Block: Effectiveness of DRP

APPENDIX C – INTERVIEW QUESTIONS

DOTs Interview Questions

Section 1: Background:

1. What is your role in your organization?
2. In what capacity were you involved in the DRP (owner, contractor…)? Explain your role.

Section II: DRP Process:

3. How do you define disputes and claims? Does it matter?
4. What triggers the dispute resolution process (DRP) to start? Provide an example
5. What dispute resolution methods (DRMs) do you use as part of your DRP and in what order of escalation?
    - For the different types of DRMs you don't use, why?
    - Which do you see as most effective? Why?
6. Do you separate active (Avoidance/Internal) and passive (Resolution/External) processes within your DRP?
    - If you don't' separate. Why?
7. Is there or should there be a different DRP based on:
    - different PDMs? Why?
    - Project Type and Size effect? Why?
    - Claim size?
    - Any other factors that influence it? Is it changed every project?

Section III: DRP Performance Metrics:

1. What is the number of disputes that went through your DRP in the last 5 years?
2. What is the magnitude of disputes that went through your DRP in the last 5 years?
3. What is the average duration of a typical dispute to resolve? Do you consider that effective overall? Why?
4. What is the average cost of a typical dispute to resolve in the last 5 years? Do you consider that effective overall? Why?
5. How do you track disputes that go through the DRP?
6. How do you measure DRP performance (internally)?
    - What are the specific KPIs, or performance indicators do you use for that? Cost, time, stage, level of satisfaction, others..
    - Quantitative vs. Qualitative?
7. Do you have lessons learned as part of the process?
    - How do you document these lessons learned?
    - How do you disseminate these lessons learned to new projects/team members?
8. Where do you keep all the information above?

Section IV: DRP Effectiveness:

9. What are the key elements for a successful DRP?
    - What is the process for reinforcing these elements in a project? How do you reinforce these?
10. How do you measure your DRP Effectiveness (with other stakeholders)?

    - What are the specific KPIs, or performance indicators that you use for that? Cost, time, stage, level of satisfaction, others..
    - Quantitative vs. Qualitative?
11. How do you deem that your DRP process fair and productive?
    - Do you follow up with other parties involved in the DRP?
12. How satisfied are you with the current DRP?
13. How satisfied are the stakeholders (e.g., contractors, consultants, etc.) with the current DRP?
14. Ask the relationship Questions as well
    - Do you usually receive bids from the contractor on different projects afterwards?
    - Are they open to negotiate different claims on the same project after conducting higher level DRM?

Stakeholders Interview Questions

Section 1: Background:

1. What is your role in your organization?
2. How many years of experience do you have (or have been involved) in Dispute Resolution?
3. In what capacity were you involved in the DRP (owner, contractor…)? Explain your role.
4. What state does your organization operate in / what state are you currently working in?
5. How many employees does your firm have?
6. What is the annual revenue of your organization (in $)?

Section II: DRP Process:

7. How do you define disputes and claims? Does it matter?
8. What triggers the dispute resolution process (DRP) to start? Provide an example
9. What is the main Dispute Resolution Process (DRP) used by the DOTs you work with and in what order of escalation?
    - Which do you see as most effective? Why?
10. Do DOTs you work with separate active (Avoidance/Internal) and passive (Resolution/External) processes within your DRP?
11. Do DOTs you work with use proactive DRP, such as partnering or others?
12. Is there or should there be a different DRP based on:
    - different PDMs? Why?
    - Project Type and Size effect? Why?
    - Claim size?
    - Any other factors that influence it? Is it changed every project?

Section III: DRP Performance Metrics:

1. What is the number of disputes that went through your DRP in the last 5 years?
2. What is the magnitude of disputes that went through your DRP in the last 5 years?
3. What is the average duration of a typical dispute to resolve? Do you consider that effective overall? Why?
4. What is the average cost of a typical dispute to resolve in the last 5 years? Do you consider that effective overall? Why?
5. In the disputes you/your firm have been involved in, at what stage of DRP are most disputes resolved?
6. Do you have lessons learned as part of the process?
    - How do you document these lessons learned?
    - How do you disseminate these lessons learned to new projects/team members?

Section IV: DRP Effectiveness:

7. What are the key elements for a successful DRP?
    - What is the process for reinforcing these elements in a project? How do you reinforce these?
8. How do you deem that your DRP process fair and productive?
    - Do you follow up with other parties involved in the DRP?

9. How satisfied are you with the current DRP?
10. How satisfied are you and your organization with the current DRP used within the DOTs you with?
11. Do you usually bid for different projects with the same DOTS afterwards?
12. Are you and your organization open to negotiate different claims on the same project after conducting higher level DRM?

APPENDIX D – DEFINITIONS

Arbitration. A non-judicial forum comprising a panel of experts to which a dispute is submitted, by agreement of the parties, who make a binding decision on the dispute.

Change Orders. Changes to the contract document that may be agreed upon or could further move to become a claim if the parties do not come to an agreement.

Claim. When disputes are not resolved, they become a formal claim,

Dispute Resolution Ladder. As part of DRP, this represents the escalation of the resolution of the dispute through the organization levels and/or other dispute methods (for example from project level to mediation, to DRB, and then to litigation).

Dispute Resolution Mechanisms. These are mechanisms/tools used within the DRP, which includes the internal (DOT and contractor) and the third-party (external entity) resolution mechanisms.

Dispute Resolution Process (DRP). A process that lays down the steps where various mechanisms are used to resolve the dispute as well as how the disputes escalate from one step to the other.

Dispute Review Board. A panel of experts selected at the start of a project, who are regularly involved in the project and thus are familiar with the project's construction contract and progress; their decision could be binding or non-binding depending on the contract.

Dispute. Any contract argument that parties do not agree but to which no formal claim has been submitted yet.

External resolution mechanisms. These are forms of DRMs in which third parties are invited to assist in resolving the dispute.

Internal resolution mechanisms. These are forms of internal resolution mechanisms that are internal to the parties involving only the owner and the contractor, without third-party involvement.

Litigation. A dispute resolution government run system, involving judges and courts that follows strict rules and vary from state-to-state; the judgment of the court is final and binding.

Mediation. A non-binding process, where a mediator assists the parties to achieve a negotiated settlement and the parties retain full control on the process (Yates and Smith 2007).