



DRBF – CALPOLY POMONA STUDY REPORT

THE EFFECTIVE USE OF DISPUTE REVIEW BOARDS ON PUBLIC PRIVATE PARTNERSHIP (P3) INFRASTRUCTURE PROJECTS IN THE USA

**FINAL REPORT
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PROJECT OVERVIEW

Mechanisms for preventing and resolving disputes are an integral part of any construction contract's risk management strategy. This becomes even more crucial in Public-Private Partnership (P3) projects that are characterized by the complexity of their long-term contractual agreements and the complex interrelationships between contracting parties.

There are many forms of dispute resolution methods, yet in the last 10-15 years there has been an increasing trend in using Dispute Review Boards (DRBs) in general, and more specifically on P3 projects. DRBs assist the parties in maintaining an open and trusting relationship, which is critical for the "partnership" aspect of a P3 project.

Since a P3 is a multiparty agreement that deals with many interface levels among the parties, questions arise on the most effective DRB arrangements that would address these multiple interface levels. This study aims at investigating effective arrangements/models of DRBs that could be used at various parties' interface levels.

To achieve this objective, the research method included the following steps: (1) literature review to identify dispute resolution processes, (2) content analysis of the dispute resolution process clauses of bid/contract documents of 10 P3 projects to benchmark the state of practice of dispute resolution procedures, (3) adoption of five proposed DRB models based on the literature review and the content analysis, as well as periodic meetings with the Dispute Resolution Board Foundation (DRBF) PPP Task Force, (4) four focus groups established to evaluate the DRB models, as well as identify the factors affecting the arrangement/model selection, and (5) a DRB model selection aid tool (DRBAID) was developed that was further validated and revised through three case studies of P3 projects.

Results of the case study interviews supported the practicality and benefits of the DRBAID at the initial planning stage of the project to determine the most effective DRB arrangement given the specificities of each project. Thus, the major contribution of this study is the development of a tool that can assist owners and owner representatives in the selection of their DRB arrangement on a P3 project.

1. INTRODUCTION

A P3 is a government-owned, public initiative that receives private funding (equity or debt or both) for development, construction, and/or operation (FHWA 2022). Typically, this arrangement is undertaken to build public infrastructure in industries such as transportation (roads, bridges, tunnels, railways, ports, and airports), energy, and water.

Due to the complexities of procuring and implementing a P3 project, the public owner and private sector entities typically employ technical, legal, and financial experts to assist with the planning, procurement, and implementation of a P3 project. The fact that P3 is a multi-party agreement including a large number of interfaces among the parties is the most significant source of friction on P3 projects.

DRBs are well-suited for P3 projects because of the way in which DRBs function to assist the parties to maintain an open and trusting relationship, which is necessary to sustain "partnership" on P3 projects (Moseley, 2020). The DRB process has the advantage of being faster, less expensive, and more suited for construction conflicts than litigation, arbitration, or mediation (Gore, et al. 2011). Despite the increased focus on P3s in the United States, data on the use of DRBs on P3s is very limited, and even less so about its effectiveness in avoiding and resolving disputes (Dettman 2013). Therefore, it is essential to investigate Dispute Review Board (DRBs) arrangements/models that could be employed at various parties' interface levels on P3 projects to resolve conflicts most effectively.

1.1 Problem Statement

P3s differ from typical project delivery methods in that they require public and private equity partners entering long-term engagements that can span many years, from procurement to design to construction, operation, and handover. Consequently, the P3 arrangement of shared risk requires constant application and adjustment as the project is implemented over its various phases.

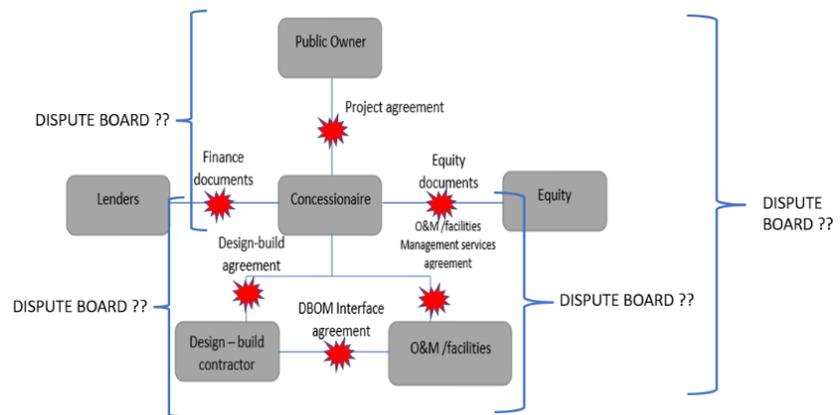


Figure 1 Potential P3 interfaces for DRB arrangement

Because P3 disputes are unavoidable and result in significant time and financial losses, the P3 process may become smoother if an in-depth understanding of dispute sources can be established ahead of time (Zheng, 2021). A skilled DRB can often foresee situations that could lead to future problems and work with the parties to take the steps necessary to prevent such problems from becoming actual disputes. The P3 multi-party agreement deals with many different interface levels between the parties, and therefore raises questions about the most effective DRB process to address these multiple interface levels. Figure 1

depicts a graphical representation of a typical P3 structure, highlighting the P3 parties' interfaces where disputes can occur, and accordingly possible DRB arrangement(s).

1.2 Study Rationale

Limited research and guidance is available on what DRB arrangements are most effective for P3 projects given the variability of the parties' involvement and their multiple interface levels. Acknowledging the problem of various parties' interface levels on P3 projects, the DRBF PPP Task Force of U.S.A. initiated a study to determine the effective arrangements/models of DRBs that could be used at various parties' interface levels on P3 projects. CalPoly Pomona was tasked to conduct the research and develop a tool kit that can support owners in the selection of most effective DRB arrangements.

1.3 Research Objective

The objective of this research is to determine the effective arrangements/models of DRBs that could be used at parties' interface levels on P3 projects, given various project characteristics and owner objectives. Findings will help to establish the composition and character of the DRB that need to be used, and thereby help to develop a framework for effective arrangements of DRBs that could be used at various interface levels, taking into account owners' project objectives and constraints. The following research questions will be answered:

1. What are the various arrangements for using DRBs on P3 Infrastructure projects in the U.S.A., as per contract requirements?
2. How are DRBs implemented on projects in U.S.A.?
3. What are the effective DRB arrangements that could be used on P3 projects given the project objectives and constraints?

1.4 Research Methodology

Figure 2 shows the methodology flowchart of the project included the following six steps:

1. Benchmarking the existing industry practices of DRB use through a literature review of pertinent publications on dispute resolution processes, and DRBs specifically, together with a content analysis of existing DOT specification documents to identify the potential DRB arrangements that could be employed at various P3 interface levels.
2. Multiple meetings with the DRBF PPP Task Force to discuss the existing practices and propose/develop the DRB models that address the interface levels among the various parties on P3 projects.
3. Focus groups with subject matter experts (including a preliminary survey) to validate the various arrangements (models) developed, as well as the driving factors leading to the selection of the various DRB models proposed. The focus group included a preliminary survey sent to the participants to gain more information on participants' previous experiences with P3 projects and DRBs. Factors affecting the arrangement/model selection were identified from focus group and based on these factors a model selection aid tool (DRBAID) was developed.
4. Development of the DRB model selection aid (DRBAID) tool to assist with the DRB arrangement selection and provide insights on each model's pros and cons.
5. Three project case studies to further vet the DRBAID, which included content analysis of the project documents, as well as interviews with the project team representatives (including owners and DRB members).
6. The DRBAID tool was then revised based on feedback from participants in the case study interviews, and best practices guidelines for implementing DRBs on P3 projects, as well as pros and cons for each model were added to the tool.

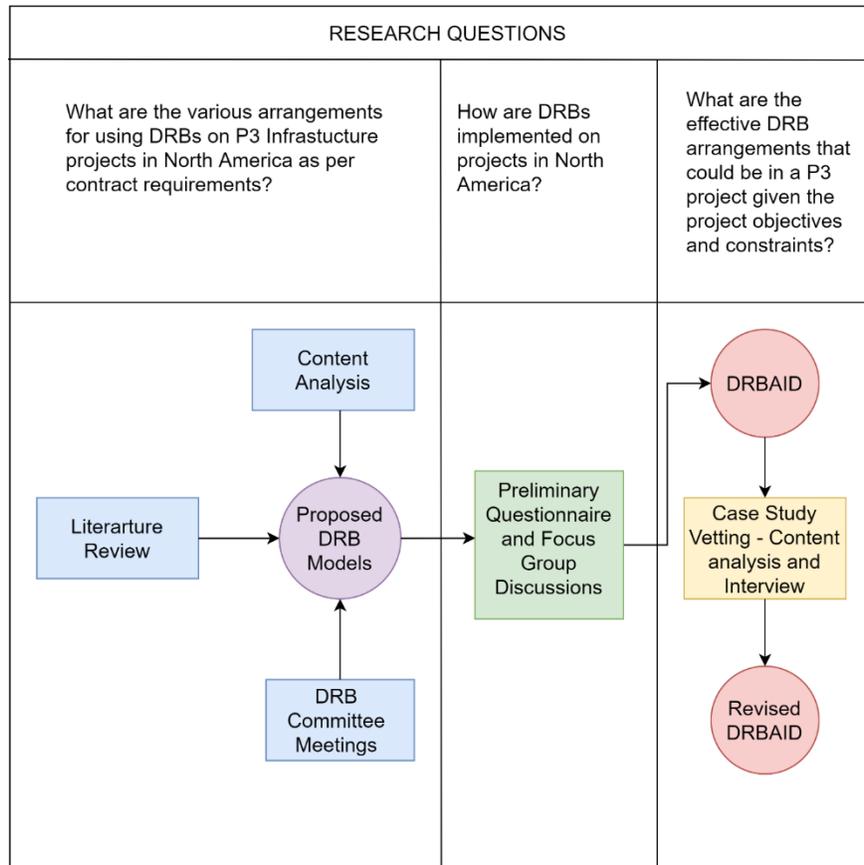


Figure 2 Methodology flowchart

1.5 Report Organization

The report is organized as follows:

- Chapter 1: Introduction, covers the problem statement, reasons for the study, research objective, and research methodology.
- Chapter 2: DRB Models development, includes the details of the content analysis of 10 P3 projects, the DRBF PPP Task Force meetings with the team, and the proposed DRB models/arrangements and the results of the focus groups and preliminary survey.
- Chapter 3: DRB model selection aid tool (DRBAID) development, discusses how DRBAID tool was developed, the tool vetting using the case studies and detailed explanation of how the tool aids in selecting each model.
- Chapter 4: Conclusions limitations and recommendations, encompasses the main study conclusions, study limitations, and project recommendations.

2. DRB MODEL DEVELOPMENT

This chapter includes the details of the content analysis of the 10 P3 projects, the DRBF PPP Task Force meetings with the team, and the proposed DRB models/arrangements, as well as the results of the focus groups (including the preliminary survey).

2.1 Content Analysis

To benchmark the dispute resolution processes used on P3 contracts, a content analysis of 10 P3 infrastructure projects in U.S.A. was conducted. The projects included highways and bridges, and were selected based on preset criteria, including being a P3 transportation project for which the contract documents are available, and located in diverse locations so it would represent variability in practices and processes. The project documents reviewed were Comprehensive Development Agreements, Concession Agreements, and Request for Proposal (RFPs). The following tasks were included in the content analysis (detailed results for the 10 projects are shown in [Appendix A](#)):

- An excel sheet was developed to capture specific information about each of the projects studied.
- Information about the project, such as scope, delivery method, cost, and team details (public and private partner) were also obtained from the respective projects' Departments of Transportation (DOT) websites.
- The DRB procedures of each project were analyzed carefully. If a DRB was used for dispute avoidance/resolution, a detailed analysis of the dispute ladder, selection of members, cost of DRB meeting and hearing (if provided) were documented. If a DRB was not used, details of whether the P3 agreement depicted an alternative dispute resolution procedure were also included.

Table 1 shows the summary of the 10 P3 projects studied in terms of parties' arrangement, whether partnering involved in the project, dispute resolution method ladder of the project, DRB arrangement, member selection method, whether the recommendation of the DRB was binding or non-binding, and if non-binding the final DRB recommendation. The types of dispute resolution methods depicted in the project documents included:

1. *Conventional DRBs*: Three of the 10 cases studied used conventional DRB. For the conventional model, the DRB process is at the Concession Contract level only, with a standing invitation for the Design-Build entity and the Operations and Maintenance entity to attend the Concession level DRB meetings.
2. *Multiple DRBs*: Two of the 10 projects used this method, which is a variation on a conventional DRB. In multiple DRBs, the scope and/or subject-matter jurisdiction are divided separately among DRBs; each DRB functions similarly to a conventional DRB. Multiple DRBs may be established to deal with disputes over finance, technical requirements, and other issues.
3. *Dispute Adjudication Board (DABs)*: Two of the 10 projects used this method, which is a formal arbitration-like process with a broad scope of review to address project disputes.
4. Other forms of dispute resolution methods (other than DRBs) were used by two projects of the 10 studied.

It was evident from the analysis that the conventional model and its variations were the most widely used DRB model in the industry, but other arrangements of the DRB at various interface levels were also confirmed. Therefore, the industry used models and hypothetical models were included in the revised model list and the validation for those models was done through the focus group and the case studies that follow.

2.2 DRBF PPP Task Force Meetings

With the research project being sponsored by the DRBF, the research team was able to get input from the leads of the DRBF PPP Task Force. The PPP Task Force was formed in 2016 to assist project parties in successfully adopting the Dispute Board process for P3 projects. Through periodical monthly meetings at the initiation of the data collection process, the research team discussed the progress of the literature review, content analysis findings, as well as various model arrangements that could be developed to address the P3 parties' interface issue.

The DRBF team included the DRBF Executive Director, a former DRBF President, and PPP Task Force co-chairs for U.S. and Canada. The output from content analysis, and the PPP Task Force input was the decision to adopt the Task Force's proposed five potential DRB arrangements shown in Table 2 and validate them through focus groups comprised of DRB subject matter experts.

2.3 Focus Group Steps

A focus group method was chosen as it allows for an open discussion of the proposed DRB models. This section details the steps undertaken in conducting the focus groups, starting from the pilot focus group, its main findings, and then moving to the preliminary questionnaire sent prior to each focus group, and then finally the actual three focus groups conducted.

2.3.1 Pilot Focus Group

A pilot focus group was planned to test the practicality of the methodology adopted, and solicit feedback on the questions asked, and the models proposed by the PPP Task Force. Participants included owner representatives, concessionaire entities, DRB members, lawyers/facilitators/arbitrators who worked on construction disputes, together with extensive experience working on P3 projects.

The model evaluation sheet used for the pilot focus group had three sections which included the engagement and exploration questions, and model evaluation table. The engagement section questions were related to the participants' current and previous roles, and their years of experience with DRB and P3 projects. The exploration questions were mostly related to the DRB process on P3 projects including:

- The level of participation of team members
- Standard reference documents used
- Cost of DRB meetings
- Time taken for the DRB to resolve a dispute
- The effectiveness of the DRB
- Level of satisfaction of the DRB in their projects

The next section was the models' discussion table that contained all six models and 11 evaluation questions. The questions for the model evaluation were prepared based on the literature review and content analysis, and the PPP Task Force input.

Table 1 Content Analysis Summary

Project Name	P3 Type	Cost	Owner	Concessionaire party arrangement	Dispute resolution ladder							DRB Model arrangement	Members Selection Method	Binding/ Non-binding DRB	If non-binding, binding option		
					Partnering	Designated Senior Person of each Party	Third party facilitator	DAB	DRB	Arbitration	Mediation					Litigation	
Michigan I-75 Modernization Project (Segment 3)	DBFM	\$1.4 billion	Michigan Department of Transportation (MDOT)	John Laing (40%) AECOM (30%) Dan's Excavating, AJAX Paving, Jay Dee Contractors (30%)	✓				✓				Model 1	Conventional Selection	Non-binding	Litigation	
I-77 Managed Lanes Project	DBFOM	\$647 million	North Carolina Department of Transportation	Cintra I-77 Mobility Partners, LLC 50.10% GCM TH Investments, LLC 20.58% John Laing I-77 Holdco Corp 10.00% Aberdeen Infrastructure Investment I-77 LLC 10.00% GCM BD Investments, LLC 9.32%	✓						✓	✓	No DRB	No DRB	No DRB Nonbinding mediation	Litigation	
Belle Chasse Bridge and Tunnel Replacement	DBFOM	\$148 million	Louisiana Department of Transportation	Plenary Infrastructure Belle Chasse (PIBC)	✓		✓					✓	✓	No DRB	No DRB	No DRB Nonbinding mediation	Litigation
Central 70 Project	DBFOM	\$1.2 billion	Colorado Department of Transportation	Kiewit Development Company (40%) Meridiam (60%)	✓				✓				Model 1 - Multiple	Conventional Selection	Non-binding	Litigation	
US 36	DBFOM	\$208.4 million	Colorado Department of Transportation	Plenary Roads Finco LP (Plenary) - the TIFIA Borrower	✓				✓				Model 1	Joint Selection	Non-binding	Litigation	
Metro Region Freeway Lighting	DBFOM	\$172 million	Michigan Department of Transportation	Star America Fund GP, LLC (85% equity partner) Aldridge Electric Company (15% equity partner)	✓				✓				Model 1	Conventional Selection	Non-binding	Litigation	
Rapid Bridge Replacement Project	DBFM	\$1.118 billion	Pennsylvania Department of Transportation	Plenary Group USA Ltd. (80%) Walsh Investors, LLC (20%)	✓				✓				Model 1 - Multiple	Conventional Selection	Non-binding	Litigation	
SH99 Grand Parkway Segment F - G Project	DBM	\$1.04 billion	Texas Department of Transportation	Zachry-Odebrecht Parkway Builders, a Texas joint venture comprised of Zachry Construction Corporation and Odebrecht Construction, Inc	✓	✓		✓					DAB	No DRB	DAB Binding		
North Tarrant Express Segments 1&2a	DBFOM	\$650 million	Texas Department of Transportation	Cintra Concesiones de Infraestructuras de Transporte, S.A. (56.7%) Meridiam Infrastructure (33.3%) Dallas Police and Fire Pension System (10%)	✓	✓		✓					DAB	No DRB	DAB Binding		
I-595 Corridor Roadway Improvements	DBFOM	\$1.8 billion	Florida Department of Transportation	I-595 Express, LLC (ACS Infrastructure Development and TIAA (50/50 split of the equity portion on loan)) as Concessionaire	✓				✓				Model 1	Conventional Selection	Non-binding	Any ADR	

Table 2 Proposed DRB Models

Model	Description	Diagram
Model 1.0	One DRB at the Concession Contract level only, with a standing invitation for the D&B Contractor and O&M entity to attend the Concession DRB meetings	
Model 1.1	Multiple DRB at the Concession Contract level	
Model 2.0	Three separate DRBs, with one covering the Concession Contract, one covering the D&B Contract and one covering the O&M Contract for the full term	
Model 3.0	Two separate DRBs, one for the Concession Contract, and one covering the D&B Contract and the early years of the O&M Contract	
Model 4.0	One DRB at the D&B Contract and O&M contract level (were most of the risks are transferred)	
Model 5.0	One DRB covering the Concession, the D&B Contract and O&M contract	

The following assumptions were also included to set the stage, remove ambiguities, and avoid individual assumptions that could be made by each participant:

1. Assume the project delivery method is Design Build Finance Operate Maintain (DRBFOM)
2. Assume the project has effective P3 project governance/management practices in place
3. Assume the project has early selection of DRB members and use for duration of projects
4. Assume contract agreement allows DRB to handle any type of dispute (that is, both technical and financial)

5. Assume use of a DRB process (even though details may vary, such as separate technical and financial DRBs)
6. Assume only Owner, Concessionaire, DRBT, O&M involvement, and not Financial Entities or Other Stakeholders involvement in the DRB Process

From the pilot focus group discussion, it was realized that discussing all the questions in a 90-minute session would be challenging. Thus, it was recommended that engagement and exploration sections be transferred to a preliminary online questionnaire survey that could be taken by the participants prior to the focus group. [Appendix B](#) shows final focus group questions and preliminary survey questionnaire.

Suggested revisions made in the focus group included:

- Additional questions on the frequency of DRB meetings, the DRB member selection process, advisory opinion process in DRB, investors and financing parties' involvement in the DRB process.
- The second question on "Cost relative to each other with Model 1.0 as your baseline?" was revised to "Using Model 1.0 "cost" (defined by out-of-pocket cost of DRB Process) as a baseline, how does each other Model compare (e.g., lower, higher, same)? Justification?". The participants felt that this question need more clarification and the cost mentioned need to be further defined.
- The third question "Time to resolution- relative to each other with Model 1.0 as your baseline? Justification?" was also revised to "Using Model 1.0 time (defined by DRB process time from dispute initiation to resolution) as a baseline, how does each other Model compare (e.g., shorter, longer, same)?" to provide more clarification.
- The sixth question "How does the model contribute to alignment of goals and outcomes?" was revised to "How effective is the Model at aligning the parties' focus on resolving issues within the overall P3 framework and contracts?"
- The seventh question "How does the model improve coordination and interaction between the parties?" was deleted because this would be already addressed by question 4 on the sheet.
- The eighth question "How does the model contribute to improving the access to information required to avoid and resolve disputes (detail/operational activities)?" was revised to "Does the Model enable all relevant information and people to be available to/within the DRB Process (e.g., including subcontractors, designers, lenders, and financial entities?" The participants stated it was important to check whether the models' enabled subcontractors, designers, lenders, and financial entities etc. to be within the DRB process.
- The ninth and 10th question "What types of disputes can the model more effectively avoid?" and "What types of disputes can the model more effectively resolve?" were combined as the participants felt this would be easier in getting input during the focus groups.
- The last question "If no O&M was included in the project, what effect do you foresee on the previous criteria?" was removed because the participants believed it would not provide useful information for the model evaluation.
- Initially, there were variations in the models 1.0 and model 5.0. Model 1.1 was multiple DRB at the Concession Contract level while Model 5.1 was alternative DRB members (ADR members) in Omnibus DRB. Model 5.1 was suggested during the pilot focus group; however, it was decided that the basic model would simply refer to a "DRB Process" to simplify the model evaluation process. Therefore, it was decided to remove these models with variation. The revised final DRB models included were Model 1 – Conventional DRB, Model 2, Model 3, Model 4, and Model 5 – Omnibus.

2.3.2 Preliminary Survey Results

Prior to conducting the focus groups, participants were sent a survey created using the software Qualtrics (see [Appendix B](#)), that included 24 questions and aimed to collect information from participants regarding their previous experiences with DRBs and P3 projects.

Listed below are the main results of the survey:

- Out of the 14 responses received, 55% of participants had 5-10 years of experience on P3 projects, 27% had 10-20 years of experience, and around 9% of the participants had 10-20 years of experience on P3 projects.
- Nine percent of the 14 participants had more than 30 years of experience, 9% had 20-30 years of experience with DRBs, 28% had 10-20 years of experience, 47% had 5-10 years, and 7% had less than 5 years of experience with P3 projects.
- Their previous roles on P3 projects included owners, DRB members who served on DRBs of P3 projects, concessionaire representatives, and financiers.
- Highways, bridges, tunnels, water, and sanitation projects were the most common types of projects they have worked on.
- DRBs were chosen by around 70% of respondents when asked about their experience with various sorts of dispute resolution methods. Other types of dispute resolution mechanisms (DRMs) selected included partnering which was selected by 18% percent of the respondents. Arbitration, mediation, and litigation were also other popular choices selected by the respondents. Expert determination and other approaches were the least selected.
- About half of the respondents stated that they used the conventional DRB in their projects. Thirteen percent of the respondents worked on a technical DRB, and another 13% had experience on a financial DRB. The remaining 25% of the respondents used design and construction DRBs and DRBs for issues between the concessionaire and the design-build entity only.
- The major types of disputes that were brought to the DRBs on P3 projects were cost impacts, followed by delays, design and construction defects, and quality issues.
- Conventional selection method was chosen by 56% of respondents (the conventional selection is when each party select two members, and the first two members elect the third member). The second most popular method chosen by 18% of the respondents was joint selection, in which both parties choose members together. Participants had generally different experience with member selection, and it was primarily a selection of members from a group proposed by the other party.
- Approximately 8 out of 14 participants reported that their projects DRB members met quarterly. Three stated that the meetings were held semiannually, while two reported holding them whenever there was a dispute.
- As to DRB meeting participants, almost all the participants reported that the owner, contractor, and designers attended the meetings.
- Almost 59% chose the non-binding option for advisory opinion's procedures, while 41% percent opted for advisory opinions as informal assistance which gives feedback on potential dispute/party negotiations; 85% of the respondents claimed that the outcomes of the DRB process were non-binding, and 15% had experience with binding decisions on the DRB process.
- Fifty-four percent of the participants chose "Agency" documents for the selection of the DRB arrangements, 20% reported there weren't any standard document, another 20% followed the DRBF standards, and about 7% used FIDIC standards on their projects.
- All 14 participants agreed that the owner and concessionaire attended all meetings, and the design-builder attended most of the meetings. Participation was defined as engagement in team meetings, providing information, and being forthcoming.

- The cost of the DRB process was mainly expressed as a percentage of the whole project cost, with most participants (around 75%) estimating it to be about 1% of the total project cost. The remaining 25% believed that it fluctuates from project to project and that they couldn't give an exact dollar or percent number for the project cost.
- The average time taken from initiation to resolution was reported by almost 85% of the participants as 3-4 months on average from initiation (referral to DRB) to resolution of dispute (DRB recommendation). The remaining participants felt time to resolution varies from project to project.
- All participants agreed that the party bringing most disputes to the DRB was the contractor.
- In response to a question on the DRB process' effectiveness in avoiding disputes, 36% stated it was extremely effective, while 27% deemed it highly effective, and the remaining participants reported that it was moderately effective.
- Almost 50% of the respondents stated that they were extremely satisfied with the DRB process, the findings obtained, and the efficiency of the process in terms of time and money, while 30% were slightly satisfied, and 20% were neither satisfied nor dissatisfied.
- On the issue of whether investors and the financing parties have been incorporated into the DRB process, all the participants reported that they have not seen financiers being directly involved in the process.

2.3.3 Focus Group Results

The feedback and opinions received from the three focus groups' participants on each of the models (in light of the assumptions) are summarized below.

DRB arrangement. *The first question asked the participants on their involvement in the five DRB arrangements.*

- Focus Group 1: Model 1 was the only model on which the experts had prior experience.
- Focus Group 2: Model 1 was familiar to all the experts. One of the experts had experience with a hybrid model of Model 1 and Model 5. The expert mentioned that the only change from the Model 5 was that all parties were not updated about the claim issues, but there wasn't any standing invitation required for the design-build entity and the O&M entity, and they can bring direct claims to the owner.
- Focus Group 3: The experts' responses were identical to those in focus group 2. One of the experts had experience with a hybrid model of Model 1 and Model 5.

According to the discussion, Model 1 appears to be the one mostly used in the industry. Some of the experts were familiar with the Model 5 but no one had any experience with Models 2, 3, or 4.

Cost. *The second question was comparing the Models' cost. The question asked the participants to use Model 1.0 "cost" (defined by out-of-pocket cost of DRB Process) as a baseline, and compare the other Models to it (e.g., lower, higher, same), as well as include justification of their responses.*

- Focus Group 1: According to the discussion, Model 2 would be three times more expensive than Model 1 because of the three different DRB processes. Model 3 with two DRB process would cost twice of Model 1. Model 4 with only one DRB process between the concessionaire DRB and the O&M would be half the cost of Model 1, and Model 5 would be 1.5 times the cost of Model 1.
- Focus Group 2: The experts in focus group 2 had a different take on the question. Experts stated that the Model 2 and Model 3 will undoubtedly be more expensive, but Model 1 and Model 5 should be evaluated based on the frequency of the DRB meetings and nature of the disputes occurring on the project.

- Focus Group 3: Experts in focus group 3 shared the same viewpoint as experts in focus group 2. They stated that the cost will depend on the project. They also emphasized that the cost will be dependent on how often the DRB meets.

Time. The third question was comparing the Models' time. The question asked the participants to use Model 1.0 "time" (defined by DRB Process time from dispute initiation to resolution) as a baseline, and compare the other Models to it (e.g., shorter, longer, same), as well as include some justification of their responses.

- Focus Group 1: According to the discussion, Models 2, 3, and 4 would have almost the same time as Model 1. Model 5 would take longer time. Model 1 and Model 5 have pass through capabilities. They also stated that if the other Models 2, 3, and 4 have pass through capabilities, then the time will vary for each model.
- Focus Group 2: Focus group 2 experts stated that same type of claim will take same time for all the Models. The overall opinion of the experts was that time will depend on the type of disputes occurring on the project.
- Focus Group 3: Focus group 3 shared the same viewpoint as focus group 2. Experts from focus group 3 noted that the time will be determined by the type, and complexity of the dispute, as well as the amount of time DRB will take listening to the disputes and briefing them. They also mentioned that the time would depend on the project's nature and the frequency of DRB meetings.

2.3.3.4 Parties participation impact on dispute avoidance and resolution

The fourth question asked the participants how the parties' participation in each Model would impact (improve) the avoidance and resolution of disputes.

- Focus Group 1: The experts had an opinion that both Models 1 and 5 are expected to have similar impact (improve) on the avoidance and resolution of disputes if the design-builder and O&M participated in the meetings under Model 1. They indicated that the concessionaire will be uncomfortable with Models 2 and 3, and that projects that choose to use these Models will need better concessionaire leadership due to separate DRB process. As for Model 4, experts indicated that the concessionaire would not utilize these models owing to the Risk of no owner involvement.
- Focus Group 2: Focus groups 1 and 2 viewpoints were similar. The experts believe that if the owner is not involved in the dispute resolution process, it will be causing more problems, and that Model 4 will not be as effective as the other Models.
- Focus Group 3: Focus group 3 had the opinion that Model 5 will be the best arrangement since all parties are involved, but the selection of this model will depend on the contractual agreement. All stakeholders will have back-to-back contracts with the concessionaire, and experts from several disciplines will convene in the DRB process. They also indicated that Model 2 will be difficult to implement when there is an interphase agreement (for creating a direct contractual relationship between the concessionaire) between the design-build entity and the O&M entity, and that Model 4 will not have much impact in avoidance and resolution of disputes owing to the lack of owner's involvement.

Impediments/barriers. The fifth question asked the participants what impediments/barriers you would foresee in implementing the DRB Process in these various arrangements.

- Focus Group 1: Experts saw most of the barriers in Model 2 and Model 3. They stated that cross relation conflicts within the design-build entity and the O&M entity could be a barrier for Model

3 and Model 4 since both the parties are together in the DRB process. All experts agreed that Model 5 requires a holistic management approach. An expert also mentioned that DRB members in a project where they worked had a DRBB mindset rather than a P3 perspective, therefore DRB members should be conversant with the contract they follow for all Models, otherwise it would be a barrier to the overall process effectiveness.

- Focus Group 2: Experts from Focus Group 2 stated that the O&M entity only occasionally attended meetings. However, it was later mentioned in the conversation that O&M will be set up after major completion and will not need to be involved in the DRB process if there are not O&M related claims.
- Focus Group 3: Experts mentioned that they find a major barrier in members' selection. According to experts, finding nine DRB members for Model 2 and six DRB members for Model 3 will be challenging. They also mentioned that to find the experts for Model 5 will also be a challenging situation.

Model effectiveness within P3 framework. The sixth question asked the participants how effective is the Model at bringing up all issues that might give rise to disputes within the overall P3 framework and contracts.

- Focus Group 1: According to experts, increased compartmentalization with separate DRB processes will result in fewer issues being raised. They also discussed the pass-through of disputes to the owner. Only Models 1 and 5 allow for pass-throughs, whereas the others do not, and when a dispute is not a pass-through, it will have a substantial influence on efficacy, just as the lack of owner participation in Model 4.
- Focus Group 2: According to experts in focus group 2, the efficiency of the models cannot be compared merely based on their arrangement. The effectiveness will be determined by the nature of the dispute.
- Focus Group 3: Focus group 3 experts shared the same viewpoint as focus group 1. The separate DRB will be capable of resolving the problems at their respective contract level and thus will help avoid disputes more effectively.

Enable All Relevant Information and People to be Available to/within the DRB Process. The seventh question asked the participants how the model enables all relevant information and people to be available to/within the DRB process (e.g., including subcontractors, designers, lenders, and financial entities)?

- Focus Group 1: Experts believe that in comparison to Model 1, Model 5 reduces barriers and involves more parties. They also believe that due to the separated DRB processes, Models 2 and 3 will have less involvement from the parties.
- Focus Group 2: Experts in Focus Group 2 stated that in their experience, subcontractors and lenders did not participate in the meetings, but equity investors did. Mostly the meeting is led by a CEI (Construction Engineering and Inspection) consultant. They also shared that both Model 1 and Model 5 allowed all relevant information and everyone to participate in the meetings, and even though Model 4 does not allow for owner involvement, it does allow everyone at that level to attend the meeting.
- Focus Group 3: Focus group 3 participants stated that Model 2 and Model 3 will not allow all relevant information and people to be available to/within the DRB Process and Models 5 will enable this due to the parties' involvement.

Overall Preference. The last part of the discussion was regarding the expert's opinion on which model they would prefer to implement on their projects. Experts on focus group 1 stated that they would choose

Models 1 and 5, and they will not select Model 4 because of no owner involvement in the DRB process. Focus group 2 experts would prefer the current practice of Model 1 as it will be more effective in their opinion. Instead of involving all parties, they believe that having the design-build entity and the O&M entity attend the meeting via a standing invitation would be a preferable option. They also stated that Models 2, 3, and 4 do not allow pass-through claims, and this might result in arguments later. Focus group 3 experts had an opinion that they would select Models 1, 2, and 5. The experts stated the same reason of all party's involvement and pass-through situation for selecting Model 1 and 5. The overall results of the focus group discussion based on the eight model evaluation questions helped in identifying the pros and cons for each model, shown in Table 3. It also helped nail down the various factors that would determine each models' selection which became a basis for the DRB aid tool (DRBAID) that will be discussed in the next sections.

From the overall evaluation completed on the focus groups, it was determined that the arrangement of the DRB process will depend on the following factors, shown in Figure 3:

1. Contractual agreement requirement – Does the contract requires the involvement of all parties?
2. Parties' participation – Which project parties will be required to participate in the Dispute Review Board process?
3. Project interface levels at which DRB process is involved – At what project interface levels are DRBs involved? Project interfaces are points of interaction between two or more parties.
4. Pass-through claims – The issue from the design-builder directly moves up to the concessionaire and the concessionaire will pass that to the owner.
5. Cost and time – What are the cost and time allotted for the DRB in a P3 project?
6. Complexity of the project – How difficult would be the project in terms of designs, construction, site conditions, etc.?
7. DRB member selection – Is finding the appropriate subject matter expert a difficult task on the project?
8. SPV Nature – What is the nature of the SPV? Is it a standalone or joint venture?
9. Project parties' interrelation – Whether any of the parties are interrelated to each other on the project, e.g., concessionaire being the owner of the Design-Build firm?

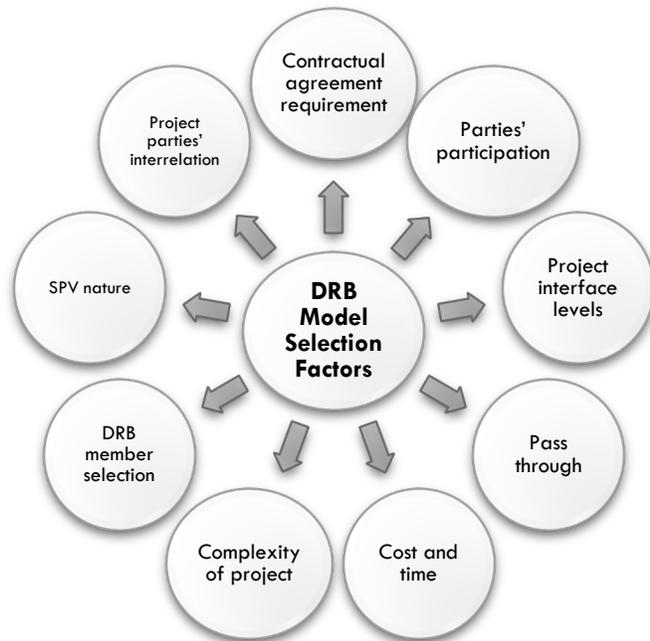


Figure 3. Factors affecting DRB arrangement selection

Table 3 Models Pros and Cons

Model Pros and Cons					
Models	Model 1	Model 2	Model 3	Model 4	Model 5
	One DB at the concession-contract level only, with a standing invitation for the D&B contractor to attend the concession DB meetings.	Three separate DBs, with one covering the concession contract, one covering the D&B contract and one covering the early years of the O&M contract	Separate DBs for the concession contract, and one covering the D&B contract and one covering the early years of the O&M contract.	One DB at the D&B and O&M contract level only	One DB covering both the concession and the D&B contract
Pros	<ol style="list-style-type: none"> 1. Enables pass-through and linked claims to be covered by one DB 2. Only One set of Dispute board members. 3. Enables DB dispute avoidance/resolution role to extend to all primary parties when needed 4. Less chance for confusions and potentially different outcomes for similar issues due to only one DB process. 	<ol style="list-style-type: none"> 1. Enables DB dispute avoidance/resolution roles at all contract levels 2. All parties involved but separately 	<ol style="list-style-type: none"> 1. Enables DB dispute avoidance/resolution roles at all contract levels 2. All parties involved but separately 	<ol style="list-style-type: none"> 1. The process is easier to manage and potentially more attractive to financiers than other options 	<ol style="list-style-type: none"> 1. All parties involved 2. Enables pass-through and linked claims to be covered by one DB 3. Permits Dispute board to apply dispute avoidance/resolution approaches to project as a whole 4. Less chance for confusions and potentially different outcomes for similar issues due to only one DB process.
Cons	<ol style="list-style-type: none"> 1. All parties involved but DBT and O&M requires a standing invitation 	<ol style="list-style-type: none"> 1. Separate DBs with separate members has the potential to create confusion and potentially different outcomes for similar issues. 2. Separate DBs with separate members. SPV is a prime participant in three separate DB process. Complex to administer, with potential for inconsistent DB process and outcomes 3. Expensive to maintain 4. Difficult to implement when there is an interphase agreement between the design-builder and the O&M 	<ol style="list-style-type: none"> 1. Separate DBs with separate members has the potential to create confusion and potentially different outcomes for similar issues. 2. Separate DBs with separate members. SPV is a prime participant in two separate DB process. Complex to administer, with potential for inconsistent DB process and outcomes. 3. Expensive to maintain 	<ol style="list-style-type: none"> 1. Disables pass-through and linked claims 2. Owner not involved 3. Enables DB dispute avoidance/resolution roles only at D&B Contract and O&M contract level only 4. Depending on the claim the effectiveness will be questioned as there is no mechanism to go to owner. 	<ol style="list-style-type: none"> 1. Difficult for appointing Dispute board members suitable to all parties.

3. DRB MODEL SELECTION AID TOOL

This chapter discusses how DRBAID tool was developed, the tool vetting using the case studies, and detailed explanation of how the tool aids in selecting each model.

3.1 DRB Model Selection Aid Tool (DRBAID) Development

Based on the focus group results and general recommendations, a DRB model selection aid tool (DRBAID) was developed to aid owners and owner representatives in selection of the most appropriate DRB given their parties arrangements and project requirements. The tool was developed using MS Excel. Nine questions that stemmed from the nine factors determined from the focus groups formed the basis of the DRBAID. The questions are listed below:

1. Does the contractual agreement require the participation of all parties in the DRB process?
2. From your understanding of the project requirements, which parties would you prefer OR need to be involved in the DRB process?
3. At what interface level(s) do you think you need the DRB(s)?
4. Does the project's Design-Build Contracts have pass-through obligations and risk from the Concession Agreement?
5. How would you rate the budget and the time available to form the DRB process on your project?
6. How would you rate the complexity (define) of your project?
7. Do you foresee challenges in finding appropriate DRB members for project?
8. Is the SPV standalone?
9. Are any parties interrelated? (For example: concessionaire being the owner of DRB firm)

The tool was designed so that each question had multiple choices options based on the characteristics of the proposed models. Figure 3 shows a snippet from the excel DRBAID sheet tool.

3.2 DRBAID Factors and DRB Models Interrelation

The DRBAID tool is designed to be used during the planning stage of a P3 project, as it will assist the owner/owner representative in selecting the appropriate DRB arrangement for its project based on the project objectives and constraints defined by the owner. As explained in the previous sections, the factors identified from the focus group were the basis for developing the DRBAID. Each question on the DRBAID was related to these factors, and the multiple-choice option given to each question was related to the characteristics of the five models/arrangements.

1. The first question on DRBAID addressed the parties' participation. The question asks the owner which project parties they need to be involved in their project DRB process. The option includes
 - owner,
 - concessionaire,
 - design-builder, and
 - O&M.

If the owner selected owner and concessionaire, only then the tool will select Model 1 as the appropriate model; since in this model, there a single dispute process between owner and concessionaire and there is only a standing invitation for design-build entity and the O&M entity

to attend the meetings. If the owner selects all the options, then the tool will select the appropriate models as 1, 2, 3, and 5 since all parties will be included in these Models. Model 4 will be selected as the appropriate model if the owner does not wish to be a part of the DRB process and does not choose the “owner” from the list as Model 4 has no owner involvement.

DRB MODEL SELECTION AID TOOL -					
<p>Assume you were in the planning stage of the project, and you have decided to use DRB as your form of DRM</p> <p>This tool will aid you in making a decision on the most effective DRB arrangement given your agency/project requirements/constraints</p>					
To answer each question, insert a "X" mark in the appropriate column					Appropriate model
1 From your understanding of the project contractual requirements, which parties would you prefer OR need to be involved in the DB process? (Choose all that apply)					
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2 At what interface level(s) of the project do you think you need the DRB(s)? (Choose one option only)					
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3 Does your projects concession agreement requires a pass through for disputes ? By pass through it means whether the issue from the design builder directly goes to the concessionaire and the concessionaire will pass that to the owner. (Choose one option only)					
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4 How much cost do you think you have allotted for DRB process on your project as % of the total project cost ? (Choose one option only)					
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5 How would you rate the time required for DRB process on your project? The time referred here is initiation (referral to DRB) to resolution (DRB recommendation) (Choose one option only)					
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6 How would you rate the complexity of your project? Complexity is rated by the dimesions such as expected design, construction, site conditions etc. (Choose one option only)					
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7 Do you foresee challenges in finding appropriate DB members for project? Challenges it mean finding the appropriate subject matter expert who can help to resolve the disputes timely) (Choose one option only)					
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8 Is there any interrelation between the parties. For example like concessionaire being the owner of DB firm or any other parties connected within each other on the project. (Choose one option only)					
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Q. No	Model 1	Model 2	Model 3	Model 4	Model 5
1	0	0	0	1	0
2	0	0	0	1	0
3	1	0	0	0	1
4	0	1	1	0	0
5	0	0	0	0	1
6	1	0	0	0	1
7	1	0	0	0	1
8	1	0	0	0	1
Results	4	1	1	2	5
DRB Model Recommendation					
Model	Model 5	Option 1			
Model	Model 1	Option 2			

Figure 4 Snippet of DRB Model Selection Aid (DRBAID) tool

- The second question on DRBAID was related to the interface levels at which they believe the DRB(s) will be needed. Project interfaces are referred to as points of interaction between two or more parties involved in the project (for example, interface between an owner and a concessionaire). There were five options for this question as detailed below:

- Option 1- Owner and Concessionaire (DRB and O&M with standing invitation): There will be only one DRB between the owner and concessionaire. The design-build entity and the O&M entity can attend the DRB meetings via a standing invitation only. If the owner chooses this option, the tool will select Model 1 as the appropriate model for this question.
 - Option 2- Owner and Concessionaire, Concessionaire & DRB, Concessionaire and O&M (each separately): There will be three separate DRBs. One DRB between the owner and concessionaire, a second DRB between the concessionaire and the design-build entity, and a third DRB between the concessionaire and the O&M entity. If the owner chooses this option, the tool will select Model 2 as the appropriate model for this question.
 - Option 3- Owner and Concessionaire and Concessionaire, design-build entity and the O&M entity: There will be two separate DRB process. One DRB between the owner and concessionaire and second DRB between concessionaire, design-build entity, and the O&M entity. If the owner chooses this option, the tool will select Model 3 as the appropriate model for this question.
 - Option 4- Concessionaire, design-build entity, and O&M entity only (no owner): One single DRB process between the concessionaire, design-build entity, and the O&M entity only. Owner of the project will not be involved in the DRB process. If the owner chooses this option, the tool will select Model 4 as the appropriate model for this question. This is the arrangement of one single DRB with no owner involvement.
 - Option 5- Owner, Concessionaire, design-build entity, and O&M entity all together: In this option, there will be one single DRB among the owner, concessionaire, design-build entity and O&M entity. If the owner chooses this option, the tool will select Model 5 as the appropriate model for this question. This is the arrangement where all the parties meet and participate in the DRB process.
3. This question was related to pass-through claims. The owner was asked whether their project will allow pass-through claims. Pass-through question means whether the issue from the design-builder directly goes to the concessionaire and the concessionaire will pass that to the owner. There were two options for this question either 'Yes' or 'No'. If the owner selected Yes, the tool would select Model 1 and 5 because only these two models allow to pass the disputes from a design-builder or O&M to concessionaire and concessionaire to the owner. If the owner doesn't have such a requirement they can select 'No', and the tool will show all five Models as appropriate for this question.
4. This question was related to the cost factor. The owner will be asked on how much cost do they think they will have allotted for the DRB process on their project as % of the total project cost. From the detailed content analysis and preliminary survey, it was seen that Model 1 and its variation was mostly used in the industry, and they usually cost about 1% of the total cost of the project. The question gave three options:
- Option 1- Less than 0.5% of the total project cost: The tool will opt Model 4 if the owner selects this option because Model 4 DRB are the ones that cost less as it only involves the concessionaire, design-build entity, and the O&M entity in the DRB process.
 - Option 2- 0.5-1.5 % of the total project cost: The mostly used model of DRB in P3 usually cost about 1% of the total cost of the project. When the owner selects this option, it will consider for Models 1 and Model 5 as these two models are mostly used in industry.

- Option 3- More than 1.5% of the total project cost: This option can be selected usually when the owner has allotted more than 1% of the project cost for DRB process. This option will select Model 2 and Model 3. Both have separate DRB process, and the owner can have subject matter experts on each interface, which is more costly.
5. This question was related to the time. The owner is asked about the expected time for initiation (referral to DRB) to resolution (DRB recommendation) of a dispute in their project. Two options 3-4 months and more than 4 months are given to this question based on the preliminary questionnaire results. The mostly used model of DRB in P3 usually takes only 3 - 4 months for initiation (referral to DRB) to resolution (DRB recommendation). Therefore, when the owner selects 3 - 4 months, the tool will select Models 1,2,3 and 4 as the appropriate model for that question. If the owner is open to the process taking more time for dispute resolution on its project, it have the advantage to include all parties in the DRB process. The time will be more than 4 months and the tool will recommend Model 5 for this question if the owner selects the second option.
 6. This question was related to the complexity of the project or nature of the disputes occurring on the project. Complexity in this question is rated by dimensions such as expected design, construction, site conditions, etc. There are two options given to this question as low/medium complexity and difficult/challenging complexity. If the owner thinks their project is not that challenging and the number of disputes that will occur is expected to be low, they can opt for option 1, and the tool will select all 5 Models as the appropriate model. This is because all models can be effective if the complexity is low. If the owner thinks their project is very challenging and the number of disputes that will occur is expected to be high, they can opt for option 2 and the tool will select Models 1 and 5. This is because Models 1 and 5 are most effective for projects with difficult/challenging complexity.
 7. This question on the DRBAID addresses DRB(s) member selection. Through this question, the owner is asked whether it foresees challenges in finding appropriate DRB members for their project. There are two options Yes or No for this question. If the owner thinks that its project will experience difficulty in finding the appropriate members, then they can choose 'yes' and this will opt Model 1 and 5. This is because Model 2 and Model 3 require separate DRBs, and it will be challenging to find nine and six DRB members for each. Even though Model 5 will require to appoint the DRB members suitable to all primary parties, it is not as much challenging as finding six and nine experts. If the owner thinks that the selection of members is not a difficult task, it can select option No, and the tool will recommend all models as the appropriate model.
 8. This question was based on the factor of the project parties' interrelationships. This question inquires whether any of the parties are interrelated to each other on the project. For example, where the concessionaire is the owner of the DRB firm, or any other party connected to each other on the project. There are three options given for this question. If the owner thinks the parties are interrelated, they can select the option 'yes' and this will opt the most appropriate Models as 1 and 5. This is because these models enable pass-through and participation of all parties (For Model 1 only if the design-build entity and the O&M entity are invited), and Models 2, 3 and 4 will not have this option. For the effective use of DRB, it is recommended to opt 1 and

5 if any parties are interrelated. If the parties are not interrelated, then the second option 'No' would be selected, and all models can be used in this situation. If the owner is not sure about this question, they can opt option 'not sure', and this input won't count towards the final answer.

After answering all the questions, the score matrix on the tool will calculate the number of times each model was selected as the appropriate Models for each question. The highest scored model will be recommended as Option 1 and second highest scored Model as Option 2. The owner can also refer to the models' pros and cons provided in the tool before making any decision.

3.3 Case Studies Results

The case study was conducted on:

1. Central 70 project of Denver, Colorado
2. I-75 Modernization Project Segment 3 of Detroit Metropolitan Region, Michigan
3. Southern Ohio Veterans Memorial Highway (Portsmouth Bypass) project of Scioto County, Ohio

The case studies included a content analysis of the dispute resolution procedures depicted in the contractual agreement between the public owner and the concessionaire to benchmark the project DRB process. In addition, interviews were conducted with the project owner and/or DRB members. Interviewees' names were concealed for confidentiality.

3.3.1 Case Study 1 - Central 70 Project of Denver, Colorado

Scope. The Central 70 Project scope is to reconstruct a 10-mile stretch of I-70 between Brighton Boulevard and Chambers Road, adding one new Express Lane in each direction, removing the 57-year-old viaduct, and placing a 4-acre park over a portion of the lowered interstate.

Project parties. The public partner is Colorado DOT, and the private partner is Kiewit Meridiam Partners LLC.

Cost. The total cost of the project was estimated at \$1,271 million.

DRB Process. A detailed content analysis of Section 25: Dispute Resolution Procedure of the project agreement was conducted to understand the DRB process of the project. The project implemented a variation of Model 1 Conventional model with two separate DRBs: a technical panel (technical nature) and a commercial panel (financial, commercial and/or legal nature). The decision of each panel was non-binding and if the dispute was not resolved, the final decision was made by the court.

Interviewees Information. Interviewee A, the project engineer who is also the owner, was interviewed for the central 70 project.

Interview highlights.

- The implementation of the DRB escalation ladder on the project did not change from what was stated in the agreement.
- Major disputes on the project were in the design and construction phase, but the disputes occurred on the projects were resolved before taking them to the DRB formal hearings.
- The DRB process was between the owner and the concessionaire and any claims from the design-builder and O&M would pass through. The owner chose this model because they wanted the claims to be vetted by the concessionaire before being passed on to the owner.
- The DRB meetings were attended by chief engineers, project managers, construction managers,

and dispute claim specialists of both parties. Prior to COVID-19, the meetings were held every three months, and the expense was significant due to travel.

- Selection of members was a not a challenging task for this project, but the only challenge was whether the DRB members with experience in P3 projects were few.

DRBAID vetting. The next section of the interview was to vet the DRBAID by applying it hypothetically to the project, as if it was in the planning stage.

- The tool's first question was if the contractual agreement required all parties to participate in the DRB process, and if so, which parties they would prefer to be on the DRB process. The interviewee stated that it was a requirement to have owner, concessionaire, and design-builder on the DRB process.
- The next question was regarding the level they think they require a DRB, and the response selected was between the owner and concessionaire with a standing invitation to the design-builder and O&M.
- On the question on pass-through obligations and risk, it was stated that the project will have a pass-through.
- As for cost and time selection, the project assumes to have 1% cost for total project for the DRB and average time would be 3-4 months for the dispute initiation to resolution and the complexity was rated to difficult/challenging complexity.
- For the appropriate member selection, the project engineer assumes that there will be difficulties in finding the subject matter expert in the various areas. The SPV nature of the project was standalone and not a joint venture.
- The last question was on the interrelation of the parties, and it was confirmed that the project concessionaire owns the design-build firm, and they were interrelated. Based on the responses, the score matrix had the highest value for Model 1 with score 7 and Model 5 with score 6.

Table 3 shows the score matrix for case study 1. The actual model implemented and recommended model for the project were the same: Model 1.

Table 3 Score Matrix – Case Study 1

Factors	Model 1	Model 2	Model 3	Model 4	Model 5
Contractual agreement requirement	0	1	1	0	1
Parties' arrangement	1	1	1	0	1
Interface levels	1	0	0	0	0
Pass through	1	0	0	0	1
Budget and time	1	0	0	0	1
Complexity of project	1	0	0	0	1
DRB Member selection	1	0	0	1	0
SPV nature	0	1	1	1	0
Parties' interrelation	1	0	0	0	1
Results	7	3	3	2	6

3.3.2 Case Study 2 - I-75 Modernization Project Segment 3 of Detroit Metropolitan Region, Michigan

Scope. Michigan DOT's (MDOT)'s I-75 Modernization Project Segment 3 project scope is to reconstruct and widen I-75 from M-102 (8 Mile Road) to south of M-59 in Metro Detroit as part of the Segment 3 runs from north of 8 Mile Road to north of 13 Mile Road in the Oakland County cities of Hazel Park, Royal Oak, and Madison Heights. Segment 3 includes the addition of the HOV/general purpose lane to 12 Mile Road, reconstruction of the existing freeway lanes, replacement of 28 structures that includes six pedestrian structures, constructing drainage improvements including an approximately 14' diameter drainage tunnel from 8 Mile Road to 12 Mile Road, upgrades and incorporating community developed aesthetic improvements, among others.

Project parties. Public partner was MDOT and the private partner was Oakland Corridor Partners.

Cost. The total cost of the project was \$1.4 billion.

DRB Process. A detailed review of the dispute resolution procedures of concession agreement was conducted to understand the DRB process of the project. The project implemented Model 1: Conventional model. The DRB recommendations were not legally binding on either party, or if the dispute was not resolved, the final decision was made by the court.

Interviewees Information. The Project Engineer interviewed on the project from MDOT will thereafter be referred to as Interviewee B.

Interview highlights.

- There weren't any changes in the implementation of DRB escalation ladder compared to what was depicted in the agreement. DRB meetings were conducted for the project, and DRB members were updated about each situation on the project, but no disputes were taken to formal hearing. All the disputes were resolved within the project level.
- The disputes that occurred on the project were mainly due to the differing site conditions and utility relief.
- The usual way of dispute settlement was followed where contracts were reviewed the parties responsible for the issues were identified, and an initial discussion made to try to address the dispute. If the discussion didn't yield a solution, a formal hearing was scheduled.
- The meetings and involvement of the DRB was very effective. The arrangement of the DRB process on the project was between the owner and concessionaire with a standing invitation to design-builder and O&M to attend the meetings.
- Project meetings were usually attended by the owners, project managers, owner representatives, consultants, concessionaire's project engineer, chief technical officer, and design-build team project engineer. The frequency of the meetings was bimonthly. The cost of the DRB meetings were around \$21,000 per year and Interviewee B mentioned that the time will really depend on the type of claim.

DRBAID vetting. The next section of the interview was to vet the DRBAID by applying it hypothetically to the project, as if it was in the planning stage.

- The project engineer opted for all the parties (owner, concessionaire, design-builder, and O&M).
- For the interface level at which DRB process requires, the project engineer thought it will be best to have a DRB process within the owner and concessionaire, with a standing invitation to the O&M

and design-builder.

- The project would have pass-through from the concessionaire to the DRB.
- The DRB will cost about 1% of the total cost of project and 3-4 months for the dispute resolution.
- The complexity of the project was rated difficult/challenging complexity and the interviewee stated that there won't be any difficulties in finding the appropriate DRB members. The nature of the SPV on the project was Standalone. There was interrelation between the parties on the project, as the concessionaire owned the design-build firm.

Based on the interviewee responses, the score matrix had the highest value for Model 1 with score 6 and Model 5 with score 5. Table 4 shows the score matrix for Case Study 2. This concludes that the actual model implemented and recommended model for the project were the same in this case study as well: Model 1.

Table 4 score Matrix – Case Study 2

Factors	Model 1	Model 2	Model 3	Model 4	Model 5
Contractual agreement requirement	0	1	1	0	1
Parties' arrangement	1	1	1	0	1
Interface levels	1	0	0	0	0
Pass through	1	0	0	0	1
Budget and time	0	0	0	1	0
Complexity of project	1	0	0	0	1
DRB Member selection	1	0	0	1	0
SPV nature	0	1	1	1	0
Parties' interrelation	1	0	0	0	1
Results	7	3	3	2	5

3.3.3 Case Study 3 - Southern Ohio Veterans Memorial Highway (Portsmouth Bypass) Project of Scioto County, Ohio

Scope. The Southern Ohio Veterans Memorial Highway is a 16-mile, four-lane, limited-access highway that runs around the city of Portsmouth in Scioto County, Ohio. The project, which is also known as State Route 823, aim is to increase travel and regional mobility by allowing motorists to avoid traffic signals and crossings on the present 26-mile route that uses US 52 and US 23.

Project parties. The public partner of the project is Ohio DOT (ODOT) and the private partner is Portsmouth Gateway Group.

Cost. Estimated cost of \$646 million.

DRB Process. A detailed review of the dispute resolution procedures in the concession agreement, was conducted to understand the project DRB process. From the agreement, it was stated that the project implemented a variation of Model 1 Conventional model with three separate DRBs (Financial DRBs,

Design and Construction Technical DRB, and O&M DRB). The decision of each panel was non-binding, and if the dispute was not resolved, the final decision was made by court.

Interviewees Information. The DRB Committee chair - Interviewee C, Concessionaire representative Interviewee D, and Project Engineer (Owner) Interviewee E were all interviewed.

Interview highlights.

- From the conversation with the interviewees, they reported that there weren't any changes in the implementation of DRB escalation ladder compared to the agreement. There was only one dispute on the project that went to a formal hearing, and that was regarding creating a protective wall due to a rock fall on site. The argument was about who would pay for it and whether it would be considered additional work on the contract.
- The project's basic dispute resolution process consisted of three steps: (1) project level discussion, (2) district dispute resolution committee, and (3) the DRB. The DRB's judgment was non-binding.
- Interviewee C stated that the formal hearing on the project was effective, and the decision were agreed by the parties and the dispute was resolved for the project. The arrangement of DRB on the project was Model 1 with multiple DRB's and the design-builder brought most of the claims to the concessionaire and the concessionaire passed it to the owner.
- Interviewee E mentioned that the project managers from the design-build team, the concessionaire, the owner, as well as any other member from owner's head office and quality assurance manager attended the DRB meetings.
- The frequency of the meeting was quarterly and the members of the DRB panel were selected through joint selection. There was an established fee for the DRB meetings and the travel of DRB members were paid by the owner. The cost of the DRB meetings was \$2,500 per meeting for the DRB chair and \$1,700 per meeting for other members.

DRBAID vetting. The next section of the interview was to vet the DRBAID by applying it hypothetically to the project, as if it was in the planning stage.

- According to all the participants' responses, the contractual agreement requires the participation of all parties and owner, concessionaire, design-builder, and O&M.
- Regarding the interface level, the project should have a single DRB between the owner, concessionaire, DRB and O&M.
- The concession agreement of the project allowed for pass-through.
- Budget and time available were 1% of the total project cost for DRB process and 3-4 months of time for dispute resolution.
- Complexity of the project was rated to difficult/challenging complexity, and SPV nature was standalone.
- There wasn't any interrelation between the parties.

Based on the responses, the score matrix had the highest value for Model 5 with score 7 and Model 1 with score 5. Table 5 shows the score matrix for Case Study 3. This concludes that although the actual model implemented on the project was Model 1, the recommended model for the project is Model 5. The interviewees agreed that Model 5 would have been a better choice.

Table 5 Score Matrix – Case Study 3

Factors	Model 1	Model 2	Model 3	Model 4	Model 5
Contractual agreement requirement	0	1	1	0	1
Parties' arrangement	1	1	1	0	1
Interface levels	0	0	0	0	1
Pass through	1	0	0	0	1
Budget and time	1	0	0	0	1
Complexity of project	1	0	0	0	1
DRB Member selection	1	0	0	0	1
SPV nature	0	1	1	1	0
Parties' interrelation	0	1	1	1	0
Results	5	4	4	2	7

3.3.4 Case Study Result Summary

The detailed review of the concession documents show that I-75 modernization project used Model 1 conventional model and Central 70 and Portsmouth bypass project used the conventional model variation of multiple DRBs. From the use of DRBAID, Central 70 project and I-75 modernization project resulted in a recommendation supporting the model actually implemented (conventional model). The reason for this can be interpreted in light of the interviewee responses, as for both projects the disputes raised on the project were resolved during the DRB meetings rather than taken to a formal DRB hearing. This indicates the project's DRB effectiveness because the DRB was able to resolve the issue at the project level rather than having to go to a formal hearing. Therefore, it confirms that the most effective DRB model was used on these two projects.

As for Portsmouth Bypass Project, the recommended model from the selection aid tool was Model 5 and the actual implemented model on the project was Model 1. As per the interviewees, this could be because the dispute raised due to the differing site condition was not able to be resolved by the first step of project level discussion and the second step of district dispute resolution committee. The third step of formal DRB hearing was required to resolve the dispute. It is imperative that a best practice of the DRB process is to avoid the dispute, and in this case the dispute took a long time to be resolved. During the interview, it was also stated that the majority of the complaints were raised by the design-build entity and passed through by the concessionaire to the owner. Therefore, ideally in this project, the design-builder is involved in all the meetings as in the case of Model 5, so the DRB can resolve the dispute timely rather than with a standing invitation as in Model 1.

As a result of the findings, using the DRBAID during the project's initial planning stage would have aided the owner in selecting a more effective DRB model given the project conditions.

3.4 Final DRB model selection aid tool (DRBAID) - Revisions incorporated

During the vetting process in the case study interviews, interviewees were asked for suggestions or recommendations to improve the tool, from which a few changes were made to the questions and the tool organization, as follows:

- The question about the nature of SPVs was removed since most participants thought this will not

be a determining factor in the model selection.

- One of the interviewees stated that sometimes the owner may not be aware at an early stage of the interrelationships between the parties, such as the concessionaire being the owner of the DRB firm, or any other parties connected within each other on the project. Therefore, a new answer choice “not sure” was added.
- The question on the contractual requirement for participation of the parties was combined with the preferred parties required to be involved on the DRB process as they both can be addressed together.
- The question on the cost and time were separated and a threshold was added to each based on the focus group results.
- A detailed instruction sheet including the graphical representation of each model and its assumptions, as well as a detailed explanation of each question, was added to provide more clarity to the users.

It is important to note that the final selection of the DRB model should be part of the procurement process, including getting input from proposers as part of the best value selection process. For maximum “buy-in” from key stakeholders on the final DRB model selected, the selection should be done collaboratively by the project sponsor, the Concessionaire, the design-build entity, and the O&M entity.

3.5 Best Practices for Dispute Board Process on P3 Projects

Regardless of the model followed, it was clear from the focus group discussions and the case study interviews that the project team members should adopt the following recommended best practices for an effective dispute board process on P3 projects:

- DRB members should be appointed at the beginning of project.
- Meeting frequency of DRB process should be quarterly.
- DRB members should understand the contract they follow, more specifically the nuances of a P3 contractual arrangement compared to other project delivery methods.
- A successful DRB should work on avoiding disputes from its origins rather than end up in hearings.
- Having separate DRBs on a project may result in less involvement of all parties. If choosing a model with more than one DRB process, it is advised to have a common Chair for all DRBs in order to coordinate on common issues and have a broader perspective of overall project issues.

4. CONCLUSIONS, LIMITATIONS, AND RECOMMENDATIONS

The objective of this study was to determine the effective arrangements/models of DRBs that could be used at multiple parties' interface levels on P3 projects, given various project characteristics and owner objectives. To achieve the project objectives, the research team conducted a literature review followed by content analysis of Comprehensive Development Agreements, Concession Agreements, and Request for Proposal of 10 P3 projects to benchmark the existing industry practices of DRB. The detailed content analysis revealed that each DOT had their own standard way of arrangement of DRBs on their projects, but they mostly followed Model 1 conventional model and its variations on P3 projects. Therefore, it became essential to investigate DRB arrangements that can improve the effectiveness of the DRB process on P3 projects. Industry used models and hypothetical models were included in the revised model list and validation for those models was conducted through focus groups and case studies.

The preliminary survey conducted prior to the focus group discussion covered the participants' prior experiences with DRBs and P3 projects (including current and previous roles, previous P3 projects and DRB arrangements they have experience with). The overall results of the focus group helped in determining the pros and cons of each model and the various factors that would affect the models' selection, such as contractual requirement, parties' participation, interface levels at which DRB process is involved, pass through obligations, cost and time factors, complexity of the project, DRB member selection, SPV nature, and project parties' interrelationships. This then formed the basis of the DRBAID tool development.

Three case studies were then conducted to vet the DRBAID usability and solicit recommendations on improvements. From the case study interviews, it was seen that the use of selection aid tool at the initial planning stage of the project would have helped the owners in selecting the appropriate DRB model selection, as they would have considered the various factors encompassed in the decision-making process. The DRBAID was also further revised based on the participant recommendations to include detailed instructions, the graphical representation of each model and its assumptions, and a detailed explanation of each question to give more clarity to the users. The focus group discussions and the case study interviews also contributed to the development of recommended best practices for an effective DRB process on P3 projects.

The major contribution of this study is that it helps in addressing the DRB arrangements that could be used at the multiple interface levels of the P3 projects where the major friction points on the P3 projects exist. The primary conclusions and recommendations derived from the results of the study are as follows:

- Because of the complexity and multi-party framework of a P3 project, particular attention needs to be given to appropriate mechanisms to prevent and resolve disputes effectively at the major friction points.
- Project sponsors should evaluate the type, frequency, and size of potential disputes and select a dispute resolution mechanism (DRM) that best fits the project-specific P3 framework and contractual arrangement. This "fitness for purpose" evaluation should also assess the criteria that will be used to select the appropriate DRM for the project.

- The conventional practice of a standing three-person DRB appointed at the start of a P3 project and continuing for the duration of the project was mostly used in all the case study projects studied. However, the type of DRB and the DRB member qualifications should be tailored to the specific circumstances of the P3 project at issue.
- The main factors identified in the study, to consider when selecting the most effective DRB model included the contractual agreement as well as the project/owner requirement in terms of parties' participation in the DRB process, the interface levels where DRBs are needed, pass-through obligations and risk from the Concession Agreement, the budget and time available to form the DRB, the project complexity, parties interrelationships as well as the SPV set-up, and the DRB members' availability.
- The DRBAID tool (that encompasses these main factors) is intended to assist the project sponsor in evaluating the P3 project dispute risk profile and in selecting the most appropriate DRB model. It is a starting point to help owners and owners' representatives evaluate the most effective establishment and deployment of the appropriate DRB model.
- The final selection of the details of the P3 project-specific DRB model should be part of the procurement process, including getting input from proposers as part of the best value selection process.
- For maximum effectiveness and "buy-in" from key stakeholders, the final model selected and implemented should be done collaboratively by the project sponsor, the Concessionaire, the design-build entity, and the O&M entity.

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APPENDIX A – DETAILED CONTENT ANALYSIS INFORMATION

PROJECT		1
		MICHIGAN I-75 MODERNIZATION PROJECT (SEGMENT 3)
Location	Michigan	
Type	DBFM (Design-Build-Finance-Maintain)	
Cost	\$1.4 billion (total 30-year project cost in year-of-expenditure dollars including preventative maintenance)	
Project Scope	Complete pavement reconstruction, modernization of the freeway, ITS upgrades, and replacement of 28 bridges (22 vehicle overpasses and ramps and 6 pedestrian structures). Safety upgrade that separates traffic entering northbound I75 from I696, and northbound I75 traffic exiting at 11 Mile Road. Widen a portion of the segment with the addition of an HOV/general purpose lane in both directions from the 8 Mile Road to 12 Mile Road. Construct a 14 foot diameter drainage tunnel from 8 Mile Road to 12 Mile Road to separate and meter freeway water from the local storm system to mitigate future concerns	
Parties' arrangement	Public Partner	Michigan Department of Transportation (MDOT)
	Private Partner	Oakland Corridor partners - John Laing (40%), AECOM (30%), Dan's Excavating, AJAX Paving, Jay Dee Contractors (30%)
Before dispute Ladder	Duration	10 days
	Level	At project level
DISPUTE LADDER step 1	Duration	10 days
	Level/who is involved	Designated Senior Person of each Party
DISPUTE LADDER Step 2	Duration	Once the contractor has requested a DRB hearing, the Engineer will notify the project DRB chairperson, and promptly assemble their claim package to support their position Submit the complete claim file to the DRB and Contractor within 10 business days of the DRB hearing request
	Level/who is involved	Engineer

PROJECT		1
		MICHIGAN I-75 MODERNIZATION PROJECT (SEGMENT 3)
DISPUTE LADDER Step 3	Duration	Schedule a hearing to be conducted within 10 business days after receiving the complete claim file from the Engineer.
	Level/who is involved	DRB Chair, Engineer, and Contractor
DISPUTE LADDER Step 4	Duration	Within seven (7) business days after the hearing date, the DRB will issue a documented recommendation for entitlement of the claim, including the underlying logic, to the Engineer and the Contractor
	Level/who is involved	Dispute Review Board
DISPUTE LADDER Step 5	Duration	(5) business days to document one of the following options to the other party and copy the DRB: 1. Accept the DRB recommendation as issued for any submitted claim issue. 2. Reject the DRB recommendation as issued for any submitted claim issue. 3. Appeal the DRB recommendation as issued for any submitted claim issue. Failure within 5 business days will reconstitute full acceptance of the DRB recommendation by that party.
	Level/who is involved	Contractor and Engineer
DISPUTE LADDER Step 6	Duration - If accepts	If both parties accept a DRB recommendation the Contractor and Engineer must continue to resolve all aspects of the dispute in a timely manner including compensation. Acceptance of a DRB recommendation does not obligate either party to the compensation amounts (time and/or money) from the claim package. Compensation must still be reviewed, negotiated, and resolved between the Engineer and Contractor and, if necessary, a contract modification processed.
	Level/who is involved	Contractor and Engineer

PROJECT		1
		MICHIGAN I-75 MODERNIZATION PROJECT (SEGMENT 3)
DISPUTE LADDER Step 7	Duration - If rejects	Documented rejection of a DRB recommendation by either party will be considered the final DRB administrative action regarding a properly documented and submitted claim issue and the Engineer retains all administrative control of the project and will provide the contractor with final direction on the claim issue. Further legal action may then be pursued by the Contractor as project administrative options will be considered to have been exhausted.
	Level/who is involved	Contractor and Engineer
DISPUTE LADDER Step 8	Duration - If appealing	The documented appeal and any response to the appeal from the opposite party must be added to the claim file and then resubmitted to the DRB within 10 business days of receiving the request for a DRB appeal hearing. Appeal hearings are to be conducted only after the DRB reviews the new information and determines that reconsideration is warranted. The DRB appeal hearing process will be the same as the DRB hearing process.
	Level/who is involved	Contractor and Engineer
DRB Recommendation		DRB recommendation is not legally binding on either party.
Final Decision		The Engineer retains all administrative control of the project and will provide final direction to the Contractor. The Contractor may pursue further legal action concerning a specific claim issue after the DRB process has been completed but only claim issues and their respective amounts that have been vetted through the DRB process will be considered following the proper administrative actions. Once final DRB processing has been completed these claim issues and their respective amounts can then be pursued through other legal processes.
Selection of DRB Members		One member selected by MDOT and approved by Developer
		One member selected by Developer and approved by MDOT
		The first two members mutually elect the third member who will act as the chairperson for all DRB activities

PROJECT	1
	MICHIGAN I-75 MODERNIZATION PROJECT (SEGMENT 3)
	After selection each nominated DRB member including the DRB chair must provide a conflict-of-interest disclosure statement to both Developer and MDOT
DRB Hearing process	<ol style="list-style-type: none"> 1. Contractor presentation 2. Engineer presentation/rebuttal 3. Break (if requested by any party) 4. Contractor rebuttal/final statement 5. Engineer final statement 6. DRB questions (questions may also be asked at any time by the DRB). Rebuttals may continue until all position points are clear to the DRB.
Cost for DRB hearing	\$7,500 for each hearing day, For additional day(s) granted for DRB hearing business, it will be at \$3,000 per calendar day
Payment done by	Contractor must pay each DRB member and provide proof of payment to the Engineer prior to conducting the DRB hearing. The Engineer will then process the reimbursement of the cost share amount to the Contractor on the next progress pay estimate through the appropriate project pay item after the hearing is conducted.
DRB Progress meeting	<p>First progress meeting - Preconstruction meeting. Second progress meeting - prior to the commencement of work operations, if needed, based on the Project Schedule and timing per approval of Developer and MDOT. Third and/or regular monthly progress meetings - after work operations start at a frequency mutually agreed upon by the Parties. DRB progress meetings frequency will be determined by MDOT, Developer, and DRB Chair.</p>
Cost for DRB progress meeting	The DRB panel will be paid \$3,500 for each DRB progress meeting. The DRB panel chair will receive \$1,500 and each of remaining two panel members will receive \$1,000
Payment done by	MDOT will reimburse Developer for the full progress meeting cost
Reference	<ol style="list-style-type: none"> 1. Michigan Department of Transportation I-75 Modernization Project (Segment 3) DRBFM Final RFP March 30, 2018 - Schedule 15 - Dispute resolution procedures 2. Michigan Department of Transportation Dispute Review Board (DRB) Procedures Revised - 2020

PROJECT		2
		I-77 MANAGED LANES PROJECT
Location		North Carolina
Type		DBFOM (Design-Build-Finance-Operate-Maintain)
Cost		\$647 million
Project Scope		The I-77 Managed Lanes project will add 26 miles of variably priced managed lanes along I-77 and I-277 in Charlotte, North Carolina north through Mecklenburg and Iredell Counties. The project will provide two 17.1-mile HOT lanes in both directions from I-277 (Brookshire Freeway) near Charlotte Center City to Catawba Avenue in Cornelius and one HOT lane per direction for an additional 8.8 miles from to NC 150 in Mooresville. At the southern end of the corridor, direct connector ramps will extend the lanes an additional 1.3 miles along I-277. The project will enhance mobility and travel time reliability in the I-77 corridor north of Charlotte.
Parties' arrangement	Public Partner	North Carolina Department of Transportation
	Private Partner	Cintra Infrastructures, S.A.
DISPUTE LADDER step 1	Duration	30 days
	Level/who is involved	Designated Senior Person of each Party
DISPUTE LADDER Step 2	Duration	Non-binding mediation shall normally be scheduled within forty-five (45) calendar days of notification of the decision by either party to submit the Dispute to non-binding mediation.
	Level/who is involved	Mediator
DISPUTE LADDER Step 3	Duration	If the Dispute is not resolved within forty-five (45) calendar days of the Parties' written notification of the Dispute to nonbinding mediation, or within such other period that the Parties may agree in writing, such Dispute may be submitted to litigation by either party
	Level/who is involved	General Court of Justice in Wake County, North Carolina
DISPUTE LADDER Step 4	Duration	If an action must be brought in a federal forum

PROJECT		2
		I-77 MANAGED LANES PROJECT
	Level/who is involved	United States District Court for the Eastern District of North Carolina
Selection of DRB Members		The Parties shall mutually select a private mediator to formally mediate the Disputes. If the Parties cannot mutually select a private mediator, the mediator shall be selected pursuant to the mediation rules established by the American Arbitration Association or other dispute resolution organization agreed to by the Parties.
Payment done by		NCDOT and Developer shall each pay one-half of the fees and administrative costs charged by the selected mediator Each Party shall bear its own attorney’s fees and costs in any dispute or litigation arising out of or pertaining to this Agreement, and no Party shall seek or accept an award of attorney’s fees or costs.
Reference		1. Comprehensive Agreement I-77 HOT Lanes Project (17.8 Dispute Resolution Procedures Pg 152 -153)

PROJECT		3
		BELLE CHASSE BRIDGE AND TUNNEL REPLACEMENT
Location		Louisiana
Type		Design-build-finance-operate-maintain toll concession
Cost		\$148 million
Project Scope		The project will replace the existing bridge and tunnel with a fixed-span, 4-lane bridge. Replacement of these structures will allow for safer and more reliable access for the residents, businesses, and industries in Plaquemines Parish. Improving the connectivity via this corridor will address the current conditions and operational constraints created by aging infrastructure.
Parties arrangement	Public Partner	Louisiana Department of Transportation and Development
	Private Partner	Plenary Infrastructure Belle Chasse LLC
DISPUTE LADDER step 1	Duration	Submit an outline statement of position regarding the Dispute to the other party and a third party facilitator.
	Level/who is involved	Designated Senior Person of each Party
DISPUTE LADDER Step 2	Duration	15 Business Days. The parties will meet with facilitator to attempt to resolve the dispute through the informal mediation process.
	Level/who is involved	Third party facilitator
DISPUTE LADDER Step 3	Duration	If within 20 Business Days after the submission to the third-party facilitator the parties cannot resolve the Dispute, then the parties will submit to at least four hours of formal mediation.
	Level/who is involved	Mediator - United States Arbitration & Mediation (USA&M)
DISPUTE LADDER Step 4	Duration	Any legal proceedings relating to any dispute
	Level/who is involved	State court of competent jurisdiction in East Baton Rouge Parish, Louisiana
Final Decision		Formal mediation involves no court procedures or rules of evidence, and the mediator will not render a binding decision or force an agreement on the LA DOTD and the Developer. The LA DOTD and the Developer will consult with legal counsel before signing documents which result from the formal mediation.
Selection of DRB Members		Third party facilitator mutually selected by the LA DOTD and the Developer. The mediator will be a USA&M mediator located in an office to be agreed upon by the LA DOTD and the Developer.

PROJECT	3 BELLE CHASSE BRIDGE AND TUNNEL REPLACEMENT
Payment done by	LA DOTD and the Developer will share equally in the costs of the third-party facilitator The LA DOTD and the Developer will share equally in the costs of the formal mediation.
Reference	1. Belle Chase Bridge & Tunnel Replacement Comprehensive Agreement (Article 20, Dispute resolution, Pg 86 - 87)

PROJECT		4
		CENTRAL 70 PROJECT
Location		Colorado
Type		DBFOM P3 (Design-Build-Finance-Operate-Maintain)
Cost		\$1.2 billion
Project Scope		The Project involves redesigning a 10-mile portion of I-70 East highway in Denver, Colorado which stretches from I-25 on the west to Tower Road on the east. The Project scope includes addition of one Express Toll Lane in each direction, the removal of the aging 53-year-old viaduct between Brighton and Colorado boulevards, the lowering of this section of the interstate below grade, and the placement of a 4-acre park over a portion of the lowered interstate.
Parties' arrangement	Public Partner	Colorado Department of Transportation
	Private Partner	Kiewit Meridiam Partners LLC
Before dispute Ladder	Duration	15 days
	Level	Amicable Dispute Settlement at project level
DISPUTE LADDER step 1	Duration	15 days
	Level/who is involved	Designated Senior Person of each Party
	Level/who is involved	Technical Panel (technical nature) or Commercial Panel (financial, commercial and/or legal nature)
DISPUTE LADDER Step 3	Duration	All decisions of each Dispute Resolution Panel shall be made, and notified in writing to the Parties, as soon as possible but in any event no later than 60 Calendar Days (or such other period as the Parties may agree in writing).
	Level/who is involved	Dispute Resolution Panel
DISPUTE LADDER Step 4	Duration	10 Working Days
	Level/who is involved	Developer shall notify the Enterprises if it intends to accept or reject such decision
DISPUTE LADDER Step 5	Duration	10 Working Days
	Level/who is involved	After receipt of Developer's notification, enterprises likewise notify Developer if they intend to accept or reject such decision.

PROJECT		4
		CENTRAL 70 PROJECT
DISPUTE LADDER Step 6	Duration - If accepts	If dispute not resolved by DRB, proceed with Court resolution.
Selection of DRB Members		Each party shall appoint one person as a member of each Panel. If either Party fails to appoint a person, the relevant member shall be appointed by the International Institute for Conflict Prevention and Resolution, upon the request of the other Party.
Reference		Central 70 Project: Project Agreement, Schedule 25 (Dispute Resolution Procedure)

PROJECT		5
		US 36
Location		Colorado
Type		DBFOM P3 (Design-Build-Finance-Operate-Maintain)
Cost		\$208.4 million
Project Scope		The US 36 Express Lanes connect Boulder to Denver at I-25—specifically from Federal Boulevard in Westminster to Table Mesa Drive in Boulder. There is an Express Lane in each direction, alongside general-purpose lanes. The US 36 Express Lanes connect to the reversible I-25 Central Express Lanes between US 36 and downtown Denver.
Parties' arrangement	Public Partner	Colorado High Performance Transportation Enterprise (HPTE) Plenary Roads Finco LP (Plenary)
	Private Partner	Concessionaire - Plenary Roads Denver, Ltd. Design-build Joint Venture - Ames Construction Inc. / Granite Construction Inc. Design Partner - HDR Engineering, Inc. Operations and Maintenance Provider - Transfield Services Ltd
Before dispute Ladder	Duration	15 days
	Level	Amicable Dispute Settlement at project level
DISPUTE LADDER step 1	Duration	When a Works Dispute has not been resolved either Party may initiate the DRB review process within 5 days. Parties shall execute the agreement within 30 days of initiating the DRB process.
	Level/who is involved	Designated Senior Person of each Party
DISPUTE LADDER Step 2	Duration	The parties shall agree upon a joint statement at least 20 days prior to the hearing and submit it to the DRB or each party's independent statement shall be submitted to the DRB and the other party at least 20 days prior to the hearing.
	Level/who is involved	Both Party
DISPUTE LADDER Step 3	Duration	A pre-hearing phone conference with all DRB members and the parties shall be conducted as soon as a hearing date is established but no later than 10 days prior to the hearing.
	Level/who is involved	DRB Chair

PROJECT		5
		US 36
DISPUTE LADDER Step 4	Duration	Dispute Review Board hearing is then conducted
	Level/who is involved	Dispute Review Board
DISPUTE LADDER Step 5	Duration	The chair shall transmit the signed Recommendation and any supporting documents to both parties. Either party may request clarification or reconsideration of a decision within 10 days following receipt of the Recommendation. Within 10 days after receiving the request, the DRB shall provide written clarification or reconsideration to both parties unless otherwise agreed to by both parties.
	Level/who is involved	Both parties
DISPUTE LADDER Step 6	Duration - If accepts	HPTE and the Concessionaire shall submit their written accept of the Recommendation, in whole or in part, concurrently to the other party and to the DRB within 14 days after receipt of the Recommendation or following receipt of responses to requests for clarification or reconsideration.
	Level/who is involved	HPTE and the Concessionaire
DISPUTE LADDER Step 7	Duration - If rejects	HPTE and the Concessionaire shall submit their written rejection of the Recommendation, in whole or in part, concurrently to the other party and to the DRB within 14 days after receipt of the Recommendation or following receipt of responses to requests for clarification or reconsideration. merit binding arbitration to finally resolve the claim.
	Level/who is involved	HPTE and the Concessionaire
DISPUTE LADDER Step 8	Duration - If appealing	Within 30 days after rejection of the Dispute Resolution Board's Recommendation (after any clarification or reconsideration) in accordance with Part 2, the Concessionaire shall provide the Director of HPTE with a written notice of intent to file a claim. HPTE will acknowledge in writing receipt of Notice of Intent within 7 days.
	Level/who is involved	HPTE and the Concessionaire
DRB Recommendation		DRB recommendation is not legally binding on either party.

PROJECT	5
	US 36
Selection of DRB Members	<p>The DRB shall have three members (composed of three Independent Experts). Once the third member is approved the three members will nominate one of them to be the Chair.</p> <p>For DRB hearing either party may use experts. A party intending to offer an outside expert’s analysis at the hearing shall disclose such intention in the pre-hearing position paper.</p>
DRB Hearing process	<p>The hearing shall be held at HPTE’s Senior Representative’s office unless an alternative location is agreed to by both parties. Unless otherwise agreed to by both parties the DRB hearing will be held within 30 days after the DRB agreement is signed by HPTE’s Director.</p>
Reference	<p>AMENDED AND RESTATED CONCESSION AGREEMENT for US 36 and the I-25 Managed Lanes, SCHEDULE 24 Dispute Resolution Procedure</p>

PROJECT		6
		Metro Region Freeway Lighting
Location		Michigan
Type		Design-build-finance-operate-maintain (DBFOM) Availability Payment Concession
Cost		\$172 million
Project Scope		The project bundled the replacement, upgrade and maintenance of approximately 15,000 lights on the five corridors for a period of 15 years. The project has improved freeway visibility, safety, and personal security, all while achieving energy savings by using efficient LED lights.
Parties arrangement	Public Partner	Michigan Department of Transportation
	Private Partner	Freeway Lighting Partners, LLC Star America Fund GP, LLC (85% equity partner) Aldridge Electric Company (15% equity partner) Design and Construction Contractor, O&M Manager - Aldridge Electric Company WSP - Lighting Design O&M Performance and Asset Management - Engie Services Group
Before dispute Ladder	Duration	10 days
	Level	At project level
DISPUTE LADDER step 1	Duration	10 days
	Level/who is involved	Designated Senior Person of each Party
DISPUTE LADDER Step 2	Duration	Once the contractor has requested a DRB hearing, the Engineer will notify the project DRB chair and promptly assemble their claim package to support their position Submit the complete claim file to the DRB and Contractor within 10 business days of the DRB hearing request.
	Level/who is involved	Engineer
DISPUTE LADDER Step 3	Duration	Schedule a hearing to be conducted within 10 business days after receiving the complete claim file from the Engineer.
	Level/who is involved	DRB Chair, Engineer, and Contractor
DISPUTE LADDER Step 4	Duration	Within seven (7) business days after the hearing date, the DRB will issue a documented recommendation for entitlement of the claim, including the underlying logic, to the Engineer and the Contractor
	Level/who is involved	Dispute Review Board

PROJECT		6 Metro Region Freeway Lighting
DISPUTE LADDER Step 5	Duration	(5) business days to document one of the following options to the other party and copy the DRB: 1. Accept the DRB recommendation as issued for any submitted claim issue. 2. Reject the DRB recommendation as issued for any submitted claim issue. 3. Appeal the DRB recommendation as issued for any submitted claim issue. Failure within 5 business days will reconstitute full acceptance of the DRB recommendation by that party.
	Level/who is involved	Contractor and Engineer
DISPUTE LADDER Step 6	Duration - If accepts	If both parties accept a DRB recommendation the Contractor and Engineer must continue to resolve all aspects of the dispute in a timely manner including compensation. Acceptance of a DRB recommendation does not obligate either party to the compensation amounts (time and/or money) from the claim package. Compensation must still be reviewed, negotiated, and resolved between the Engineer and Contractor and, if necessary, a contract modification processed.
	Level/who is involved	Contractor and Engineer
DISPUTE LADDER Step 7	Duration - If rejects	Documented rejection of a DRB recommendation by either party will be considered the final DRB administrative action regarding a properly documented and submitted claim issue and the Engineer retains all administrative control of the project and will provide the contractor with final direction on the claim issue. Further legal action may then be pursued by the Contractor as project administrative options will be considered to have been exhausted.
	Level/who is involved	Contractor and Engineer
DISPUTE LADDER Step 8	Duration - If appealing	The documented appeal and any response to the appeal from the opposite party must be added to the claim file and then resubmitted to the DRB within 10 business days of receiving the request for a DRB appeal hearing. Appeal hearings are to be conducted only after the DRB reviews the new information and determines that reconsideration is warranted. The DRB appeal hearing process will be the same as the DRB hearing process.

PROJECT		6
		Metro Region Freeway Lighting
	Level/who is involved	Contractor and Engineer
DRB Recommendation		DRB recommendation is not legally binding on either party.
Final Decision		The Engineer retains all administrative control of the project and will provide final direction to the Contractor. The Contractor may pursue further legal action concerning a specific claim issue after the DRB process has been completed but only claim issues and their respective amounts that have been vetted through the DRB process will be considered following the proper administrative actions. Once final DRB processing has been completed these claim issues and their respective amounts can then be pursued through other legal processes.
Selection of DRB Members		<p>One member selected by MDOT and approved by Developer</p> <p>One member selected by Developer and approved by MDOT</p> <p>The first two members mutually elect the third member who will act as the chairperson for all DRB activities</p> <p>After selection each nominated DRB member including the DRB chair must provide a conflict-of-interest disclosure statement to both Developer and MDOT.</p>
DRB Hearing process		<ol style="list-style-type: none"> 1. Contractor presentation 2. Engineer presentation/rebuttal 3. Break (if requested by any party) 4. Contractor rebuttal/final statement 5. Engineer final statement 6. DRB questions (questions may also be asked at any time by the DRB). Rebuttals may continue until all position points are clear to the DRB.
Cost for DRB hearing		\$6,500 for each hearing day, For additional day(s) granted for DRB hearing business, it will be at \$3,000 per calendar day
Payment done by		Contractor must pay each DRB member and provide proof of payment to the Engineer prior to conducting the DRB hearing. The Engineer will then process the reimbursement of the cost share amount to the Contractor on the next progress pay estimate through the appropriate project pay item after the hearing is conducted

PROJECT	6 Metro Region Freeway Lighting
DRB Progress meeting	First progress meeting - Preconstruction meeting. Second progress meeting - prior to the commencement of work operations, if needed, based on the Project Schedule and timing per approval of Developer and MDOT. Third and/or regular monthly progress meetings - after work operations start at a frequency mutually agreed upon by the Parties. DRB progress meetings frequency will be determined by MDOT, Developer, and DRB Chairperson.
Cost for DRB progress meeting	The DRB panel will be paid \$3,500 for each DRB progress meeting. The DRB panel chair will receive \$1,500 and each of remaining two panel members will receive \$1,000
Payment done by	MDOT will reimburse Developer for the full progress meeting cost
Reference	1. PROJECT AGREEMENT MICHIGAN DEPARTMENT OF TRANSPORTATION DELIVERY OF FREEWAY LIGHTING AS A DESIGN-BUILD-FINANCE-OPERATE/MAINTAIN PROJECT - Execution Version 2. Michigan Department of Transportation Dispute Review Board (DRB) Procedures Revised - 2020

PROJECT		7
		Rapid Bridge Replacement project
Location		Pennsylvania
Type		Design-build-finance-maintain Availability Payment Concession
Cost		Project cost - \$1.118 billion (includes financing costs) Design-build contract - \$899 million
Project Scope		The Pennsylvania Rapid Bridge Replacement Project will replace 558 structurally deficient bridges across the commonwealth under a design-build-finance-maintain (DRBFM) public-private partnership (P3) arrangement between PennDOT and Plenary Keystone Partners. The concessionaire will also be responsible for demolishing the existing bridges, maintaining traffic during construction, and then maintaining the bridges for 25 years following construction. PennDOT will retain ownership of the bridges throughout the concession period. The project will be completed in two phases with the first involving the replacement of 87 Early Completion Bridges (ECBs), and the second including the 471 Remaining Eligible Bridges (REBs).
Parties' arrangement	Public Partner	Pennsylvania Department of Transportation (PennDOT)
	Private Partner	Plenary Walsh Keystone Partners - Plenary Group USA Ltd. (80%) and Walsh Investors, LLC (20%)
Before dispute Ladder	Duration	15 days
	Level	At project level
DISPUTE LADDER step 1	Duration	The Development Entity shall submit a Dispute by way of a written protest to the Department within fifteen (15) days of the Dispute arising, outlining in detail the basis of the Dispute, the Development Entity's position relative to the Dispute and submitting all relevant documentation.
	Level/who is involved	Designated Senior Person of each Party
DISPUTE LADDER Step 2	Duration	The Department shall have fifteen (15) days following the receipt of such written protest from the Development Entity to render a written decision on the Dispute taking into consideration the relevant Project. The Development Entity may file a written rebuttal with the Department within 10 days after its receipt of the written decision, stating clearly and in detail the basis for the objection.
	Level/who is involved	Department and development entity

PROJECT		7
		Rapid Bridge Replacement project
DISPUTE LADDER Step 3	Duration	The Department will review the Development Entity's written rebuttal and issue a final written decision to the Development Entity within 10 days after receipt of the rebuttal. The Department's final written decision in response to the Development Entity's rebuttal is final and conclusive on the Dispute, unless within fifteen (15) days of the Department's final written decision, the Development Entity (i) files a claim in relation to the Dispute and submit to proper DRB.
	Level/who is involved	Department and development entity
DISPUTE LADDER Step 4	Duration	The Department or the Development Entity submit Dispute to both the Technical Disputes Review Board and the Financial Disputes Review Board for determination by the Disputes Review Boards jointly. The Relevant Disputes Review Board shall hold the hearing within twenty (20) days of the referral, unless the Parties agree to a longer time
	Level/who is involved	Technical and Financial Disputes Review Board
DISPUTE LADDER Step 5	Duration	The Disputes Review Board's recommendations for resolution of the Dispute will be given in writing to both the Department and the Development Entity within fifteen (15) days after completion of the hearings. Within fifteen (15) days of receiving the Relevant Disputes Review Board's recommendations, both the Department and the Development Entity will respond to the other and to the Relevant Disputes Review Board in writing, signifying either acceptance or rejection of the Relevant Disputes Review Board's recommendations.
	Level/who is involved	DRB, Department and the Development Entity
DISPUTE LADDER Step 6	Duration - If accepts	If the Parties accept (or if the Development Entity is deemed to have accepted) any recommendation of the Relevant Disputes Review Board. each Party shall (unless otherwise specified in the relevant recommendation) give effect to such recommendation as soon as is reasonably practicable.
	Level/who is involved	Department and development entity
DISPUTE LADDER Step 7	Duration - If rejects	Proceed to litigation

PROJECT		7
		Rapid Bridge Replacement project
	Level/who is involved	Department and development entity
DRB Recommendation		Recommendations of the Relevant Disputes Review Board shall be final and binding only to the extent the Parties accept such recommendations
Final Decision		If a recommendation of the Relevant Disputes Review Board is: (i) not accepted (or deemed to have been accepted) by both Parties(ii) accepted by both Parties, but a Party does not give effect to such recommendation in accordance with the requirements. then either Party may proceed to litigation of such unresolved Dispute, and all records and written recommendations of the Relevant Disputes Review Board will be admissible as evidence in any subsequent proceedings.
Payment done by		Each Party will bear its own attorneys' fees and costs in any Dispute arising out. And no Party will seek or accept an award of attorneys' fees or costs, except as otherwise expressly provided
Reference		1. Project Profile: Pennsylvania Rapid Bridge Replacement Project, U.S. DOT, Federal Highway Administration 2. THE PENNSYLVANIA RAPID BRIDGE REPLACEMENT PROJECT PUBLIC-PRIVATE TRANSPORTATION PARTNERSHIP AGREEMENT, DISPUTE RESOLUTION PROCEDURES, Pg 95-99

PROJECT		8
		SH 99 Grand Parkway Segment F - G Project
Location		Texas
Type		Design-build - Maintain (DBM)
Project Scope		<p>Grand Parkway, SH 99 D-G is a 53-mile segment of the planned 180-mile circumferential Grand Parkway toll highway around the Greater Houston Metropolitan Region. The Grand Parkway is divided into 11 segments in all (A through I-2), to be constructed at different times as deemed necessary. The Parkway segments provide two lanes in each direction with intermittent frontage roads. This project includes two segments:</p> <p>Segment F-1 is 12 miles from US 290/Northwest Freeway to SH 249/Tomball Parkway.</p> <p>Segment F-2 is 12.1 miles from SH 249/Tomball Parkway to I-45 North.</p> <p>Segment G is 13.7 miles from I-45 North to US 59 North/Eastex Freeway/I-69</p>
Parties' arrangement	Public Partner	Texas Department of Transportation
	Private Partner	Zachry-Odebrecht Parkway Builders, a Texas joint venture comprised of Zachry Construction Corporation and Odebrecht Construction, Inc
Before dispute Ladder	Duration	Partnering will be encouraged in preference to formal dispute resolution mechanisms
	Level	Both Parties
DISPUTE LADDER step 1	Duration	Claiming Party must first attempt to resolve the Dispute directly with the responding Party through the informal resolution procedures
	Level/who is involved	Both Parties
DISPUTE LADDER Step 2	Duration	If the Dispute is not resolved commencing within 10 Business Days (five Business Days for Fast-Track Disputes) after the notice of Dispute is served and concluding 10 Business Days thereafter, the Chief Executive Officer of Developer and the Executive Director or the Executive Director's designate whose rank is not lower than Assistant Executive Director, shall meet and confer, in good faith, to seek to resolve the Dispute raised in the claiming Party's notice of Dispute. If they succeed in resolving the Dispute, Developer and TxDOT shall memorialize the resolution in writing.
	Level/who is involved	The Chief Executive Officer of Developer and the Executive Director or the Executive Director's designate whose rank is not lower than Assistant Executive Director

PROJECT		8
		SH 99 Grand Parkway Segment F - G Project
DISPUTE LADDER Step 3	Duration	If dispute is not timely resolved under the Informal Resolution Procedures, then within 15 days (seven days for Fast-Track Disputes) Parties may mutually agree to initiate mediation or other alternative dispute resolution process or Either Party may refer the Dispute to the Disputes Board.
	Level/who is involved	Both Parties
DISPUTE LADDER Step 4	Duration	Within 15 days (seven days for Fast-Track Disputes) after the end of the last time period under the Informal Resolution Proceedings, either Party may refer a Dispute to the Disputes Board for resolution by serving written notice on the other Party Within 15 days (seven days for Fast-Track Disputes) after a Party refers a Dispute to the Disputes Board, the responding Party shall serve a written response upon the claiming Party's designated agent.
	Level/who is involved	Both Parties
DISPUTE LADDER Step 5	Duration	If, within 20 days after the Disputes Board's issuance of the Disputes Board Decision to TxDOT and Developer (the "Appeal Period"), either Party is dissatisfied with the Disputes Board Decision. Developer may request the Executive Director to seek and/or (ii) TxDOT may seek a formal administrative hearing before SOAH pursuant to Texas Government Code.
	Level/who is involved	Both Parties
DISPUTE LADDER Step 6	Duration - If accepts	If Developer does not request, and TxDOT does not seek for itself, a formal administrative hearing before SOAH within the Appeal Period, then within 10 Business Days after the expiration of the Appeal Period, the Executive Director shall issue the Final Order Implementing Decision as a purely ministerial act. If the Executive Director fails to issue the Final Order Implementing Decision within this 10 Business Day time period, the Disputes Board Decision shall become effective as the Final Order Implementing Decision for all purposes on the next Business Day.
	Level/who is involved	Executive Director of Developer

PROJECT		8
		SH 99 Grand Parkway Segment F - G Project
DISPUTE LADDER Step 7	Duration - If rejects	If the Executive Director concludes that Grounds for Appeal prejudiced the rights of a party or affected the Disputes Board Decision, the Executive Director shall rule that the Disputes Board Decision is invalid and shall remand the Dispute to the Disputes Board for reconsideration Developer and TxDOT, by mutual agreement, may refer a Dispute to mediation or other alternative dispute resolution process for resolution. The Parties shall use diligent efforts to convene and conclude mediation proceedings within 30 days after they agree to refer the Dispute to mediation or other alternative dispute resolution process.
	Level/who is involved	Both Parties
DISPUTE LADDER Step 8	Duration - If appealing	If the Executive Director concludes that Grounds for Appeal prejudiced the rights of a party or affected the Disputes Board Decision, the Executive Director shall rule that the Disputes Board Decision is invalid and shall remand the Dispute to the Disputes Board for reconsideration.
	Level/who is involved	Executive Director of Developer
DRB Recommendation		Upon completion of the remainder of the procedures required under the Code and the DRP Rules, each Disputes Board Decision shall be final, conclusive, binding upon and enforceable against the Parties.
Payment done by		TxDOT and Developer shall jointly select a third-party facilitator to conduct the partnering meetings. The cost of the facilitator shall be shared equally by TxDOT and Developer. Developer and TxDOT shall share equally the expenses of the mediation or other alternative dispute resolution process.
Reference		1. Development Agreement, Grand Parkway Project Segment F-G, Section 19. Partnering And Dispute Resolution Pg 158-170

PROJECT		9
		North Tarrant Express Segments 1&2A
Location		Texas
Type		DBFOM (Design-Build-Finance-Operate-Maintain)
Cost		\$650.00M
Project Scope		The first Concession CDA includes the design, development, construction, finance, maintenance, and operation of 13 miles along Interstate (IH) 820 (Segment 1) and State Highway (SH) 121/SH 183 from IH 35W to SH 121, from north of Fort Worth to just southwest of Dallas-Fort Worth International Airport (Segment 2A). The duration of the concession is 52 years. The existing highway includes two general purpose lanes in each direction. Proposed improvements include three general purpose lanes in each direction with two managed lanes in each direction for a total of 10 lanes with frontage roads for future traffic volumes.
Parties arrangement	Public Partner	Texas Department of Transportation
	Private Partner	NTE Mobility Partners, LLC
Before dispute Ladder	Duration	Partnering will be encouraged in preference to formal dispute resolution mechanisms
	Level	At Project level
DISPUTE LADDER step 1	Duration	Claiming Party must first attempt to resolve the Dispute directly with the responding Party through the Informal Resolution Procedures. Time limitations set forth for those Informal Resolution Procedures may be changed by mutual written agreement of the Parties.
	Level/who is involved	Both Parties
DISPUTE LADDER Step 2	Duration	If the Dispute is not resolved commencing within 10 Business Days (five Business Days for Fast-Track Disputes) after the notice of Dispute is served and concluding 10 Business Days thereafter, the Chief Executive Officer of Developer and the Executive Director or the Executive Director's designate whose rank is not lower than Assistant Executive Director, shall meet and confer, in good faith, to seek to resolve the Dispute raised in the claiming Party's notice of Dispute. If they succeed in resolving the Dispute, Developer and TxDOT shall memorialize the resolution in writing.

PROJECT		9
		North Tarrant Express Segments 1&2A
	Level/who is involved	The Chief Executive Officer of Developer and the Executive Director or the Executive Director's designate whose rank is not lower than Assistant Executive Director.
DISPUTE LADDER Step 3	Duration	If a Dispute is submitted to but not timely resolved under the Informal Resolution Procedures, then the Parties may mutually agree to initiate mediation or other alternative dispute resolution process.
	Level/who is involved	Both Parties
DISPUTE LADDER Step 4	Duration	Within 15 days after the end of the CEO / Executive Director meetings or the end of any mediation conducted whichever is later, either Party may refer a Dispute to the Disputes Board for resolution by serving written notice on the other Party. Within 15 days (seven days for Fast-Track Disputes) after a Party refers a Dispute to the Disputes Board, the responding Party shall serve a written response upon the claiming Party's designated agent.
	Level/who is involved	Both Parties
DISPUTE LADDER Step 5	Duration	If either Party believes that Grounds for Appeal affected a Disputes Board Decision, then within 20 days after the Disputes Board's issuance to TxDOT and Developer of the subject Disputes Board Decision that Party may request the Executive Director to seek a formal administrative hearing before the State Office of Administrative Hearings ("SOAH") pursuant to Texas Government Code.
	Level/who is involved	Both Parties
DISPUTE LADDER Step 6	Duration - If accepts	If there is not a timely request for a formal administrative hearing before SOAH based on Ground for Appeal, then within 10 Business Days after the expiration of the deadline for such a request, the Executive Director shall issue a final order that implements the Disputes Board Decision. If the Executive Director does not issue the final order implementing the Disputes Board Decision within such 10 Business Days, the Disputes Board Decision shall become effective as the final order of the Executive Director effective on the next Business Day.
	Level/who is involved	Executive Director of Developer

PROJECT		9
		North Tarrant Express Segments 1&2A
DISPUTE LADDER Step 7	Duration - If rejects	If the Executive Director concludes that Grounds for Appeal prejudiced the rights of a party or affected the Disputes Board Decision, the Executive Director shall rule that the Disputes Board Decision is invalid and shall remand the Dispute to the Disputes Board for reconsideration Developer and TxDOT, by mutual agreement, may refer a Dispute to mediation or other alternative dispute resolution process for resolution. The Parties shall use diligent efforts to convene and conclude mediation proceedings within 30 days after they agree to refer the Dispute to mediation or other alternative dispute resolution process.
	Level/who is involved	Both Parties
DISPUTE LADDER Step 8	Duration - If appealing	If the Executive Director concludes that Grounds for Appeal prejudiced the rights of a party or affected the Disputes Board Decision, the Executive Director shall rule that the Disputes Board Decision is invalid and shall remand the Dispute to the Disputes Board for reconsideration.
	Level/who is involved	Executive Director of Developer
Payment done by		TxDOT and Developer shall jointly select a third-party facilitator to conduct the partnering meetings. The cost of the facilitator shall be shared equally by TxDOT and Developer. Developer and TxDOT shall share equally the expenses of the mediation or other alternative dispute resolution process.
Reference		1. COMPREHENSIVE DEVELOPMENT AGREEMENT, 17.8 Dispute Resolution Procedures, Pg 157 - 166

PROJECT		10
		I-595 Corridor Roadway Improvements
Location	Florida	
Type	DBFOM (Design, build, finance, operate, and maintain)	
Cost	\$1,833.6 million	
Project Scope	The I-595 Corridor Roadway Improvements project consisted of the reconstruction and widening of the I-595 mainline and all associated improvements to frontage roads and ramps from the I-75/Sawgrass Expressway interchange to the I-595/I-95 interchange, for a total project length of approximately 10.5 miles. The project passes through, or lies immediately adjacent to, six jurisdictions: City of Sunrise; Town of Davie; City of Plantation; City of Fort Lauderdale; Town of Dania; and unincorporated areas of Broward County.	
Parties' arrangement	Public Partner	Florida Department of Transportation (FDOT)
	Private Partner	I-595 Express, LLC (ACS Infrastructure Development and TIAA (50/50 split of the equity portion on loan)) as Concessionaire
Before dispute Ladder	Duration	If Concessionaire objects to any decision, action, or order of FDOT, Concessionaire may file a written protest with FDOT, stating clearly and in detail the basis for the objection, within 15 days after the event. DOT will consider the written protest and make its decision on the basis of the pertinent Contract Documents, together with the facts and circumstances involved in the Dispute. FDOT's decision will be furnished in writing to Concessionaire within 15 days after receipt of Concessionaire's written protest. This decision will be final and conclusive on the subject, unless written appeal to FDOT is filed by Concessionaire within 15 days of receiving the decision.
	Level	At Project level
DISPUTE LADDER step 1	Duration	Upon receipt by the Regional DRB of a written duly preserved protest of a Dispute, either from DOT or Concessionaire, it will first be decided when to conduct the hearing.
	Level/who is involved	DRB
DISPUTE LADDER Step 2	Duration	Either Party furnishing any written evidence or documentation to the Regional DRB will furnish copies of such information to the other Party a minimum of 15 days prior to the date the Regional DRB sets to convene the hearing for the Dispute.

PROJECT		10
		I-595 Corridor Roadway Improvements
	Level/who is involved	Either Party
DISPUTE LADDER Step 3	Duration	The Regional DRB's recommendations for resolution of the Dispute will be given in writing to both FDOT and Concessionaire, within 15 days of completion of the hearings.
	Level/who is involved	DRB
DISPUTE LADDER Step 4	Duration	Within 15 days of receiving the Regional RB's recommendations, both FDOT and Concessionaire will respond to the other and to the Regional DRB in writing, signifying either acceptance or rejection of the Regional DRB's recommendations.
	Level/who is involved	Both Parties
DISPUTE LADDER Step 6	Duration - If accepts	The failure of either Party to respond within the 15-day period will be deemed an acceptance of the Regional DRB's recommendations by that Party.
	Level/who is involved	Both Parties
DISPUTE LADDER Step 8	Duration - If appealing	If the dispute remains unresolved either Party may seek reconsideration of the decision by the Regional DRB only when there is new evidence to present. If the Regional RB's recommendations do not resolve the Dispute, all records, and written recommendations of the Regional DRB will be admissible as evidence in any subsequent dispute resolution procedures.
	Level/who is involved	Both Parties
DRB Recommendation		DRB recommendation is not legally binding on either party.
Selection of DRB Members		One member is selected by FDOT, One member is selected by concessionaire and the third member is selected by the first two members from the jointly developed list of 5 members. The third member act as the chairman.

PROJECT	10
	I-595 Corridor Roadway Improvements
DRB Progress meeting	<p>Regular meetings shall occur at the Site. Each meeting shall consist of an informal round table discussion followed by field observation of the Work. Selected personnel from FDOT and Concessionaire shall attend the round table discussion.</p> <p>The agenda shall generally include the following:</p> <ul style="list-style-type: none"> (a) Meeting convened by the Chairman of the DRB. (b) Opening remarks by DOT's representative. (c) A description by Concessionaire of: <ul style="list-style-type: none"> i. Work accomplished since the last meeting, ii. Status of the Work schedule, iii. Schedule for future Work, iv. Potential or anticipated problems and proposed solutions, and v. Current and potential Disputes and other controversies. (d) Discussion by DOT's representative of: <ul style="list-style-type: none"> i. The Work schedule ii. Potential Disputes and other controversies, and ii. Status of past Disputes. (e) Such other items as the Parties may wish to discuss with the DRB. (f) Set a tentative date for the next meeting(s).
Reference	I-595 Corridor Roadway Improvements Concession Agreement & Appendices

APPENDIX B – PRELIMINARY SURVEY AND MODEL EVALUATION SHEET

Focus Group Preliminary Survey

THE EFFECTIVE USE OF DISPUTE REVIEW BOARDS ON PUBLIC-PRIVATE PARTNERSHIP (P3) INFRASTRUCTURE PROJECT

Hello all,

Dispute Resolution Board Foundation (<https://www.drb.org/>) is sponsoring a research project to develop best practice guidelines for the effective use of Dispute Review Boards on Public-Private Partnership (P3) infrastructure projects in North America. These practices and guidelines will ultimately assist project owners, contractors, financing institutions, and other project parties in dispute avoidance and management on P3 projects. A research team at CalPoly Pomona has been tasked to develop these best practices guide/framework for deployment on infrastructure projects. The information collected from the survey will be kept confidential and will only be used in the aggregate for research purposes. All responses will be stored on a password-protected computer with limited access to the researcher. For any inquiries or feedback, please do not hesitate to contact me

Thank you,
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By clicking the "I agree" button you agree to participate in the survey

- I agree

Q1 1. Name _____

Q2 2. Current position _____

Q3. Years of experience with P3 projects

- 0-5 years
- 5-10 years
- 10-20 years
- 20-30 years
- More than 30 years

Q4 Years of experience with involvement in Dispute Review Boards (DRB)

- 0-5 years
- 5-10 years
- 10-20 years
- 20-30 years
- More than 30 years

Q5 Previous roles with DRB or other P3 projects (Select all that apply)

- DRB Member
- Owner
- Contractor
- Contractor representative, please specify role _____
- Owner representative, please specify role _____
- Other (please specify)

Q6. What were the various types of projects that you were involved in? (Select all that apply)

- Bridges
- Highways
- Tunnels
- Water and sanitation
- Ports
- Airports
- Power plants
- Energy
- Buildings
- Other (please specify) _____

Q7 What were the various types of Dispute Resolution Methods (DRM) that you were involved in? (Select all that apply)

- Dispute review boards
- Partnering
- Arbitration
- Mediation
- Litigation
- Expert determination
- other (please specify) _____

Q8. What were the various arrangements of P3 DRBs that you have experience with?(Select all that apply)

- Conventional DRB
- Technical DRB
- Financial DRB
- Operations and Maintenance DRB
- Other (please specify) _____

Q9 What were the major types of disputes that were brought to the DRBs in the P3 projects you were involved in?(Select all that apply)

Q10 How were the DRB members selected on P3 projects you were involved in?

- Conventional Selection (Each party selects 2 members, and the first two members elect the third member)
- Joint Selection
- Other (Please specify) _____

Q11 What was the frequency of DRB meetings?

- Monthly
- Quarterly
- Semi-annually
- Other (please specify) _____

Q12 DRB Meeting participants included (Select all that apply)

- Owner
- Contractor
- Designer
- Financial Parties
- External stakeholders, please specify _____
- Other (please specify) _____

Q13 Advisory Opinions process in DRB are usually (Select all that apply)

- Non-Binding (Provides a recommendation that is not binding on the parties)
- Informal Assistance (Informal feedback on potential disputes/party negotiations)
- Other (Please specify) _____

Q14 The outcomes of the DRB hearing process in your experience were: (please select all that apply)

- Binding (Provides a recommendation that is binding on the parties)
- Non-Binding (Provides a recommendation that is not binding on the parties)
- Other (please specify) _____

Q15 What standards/reference documents (if any) were used for the selection of the DRB arrangements on your previous projects?

- No Standard document
- Dispute Resolution Board Foundation
- FIDIC
- American Institute of Architects (AIA)
- EJCDC
- Consensus DOCS
- Other agency (Please specify) _____

Q16 What level of the parties' representatives participated in the DRB meetings?

- Senior management
- Project team members
- Third party stakeholders
- Contractor
- Specialty staff from agency (Geotech engineers, Structural engineers, etc.)
- Other (Please specify) _____

Q17 What was the level of participation (by participation it means engaged in team meetings and providing information and being forthcoming) of the project team members in DRB meetings?

	Participated in every meeting	Participated in most meetings	Participated in few meetings	No participation	Other
Owners	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Contractors	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Design/builder	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other member 1 (Please specify)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other member 2 (Please specify)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other member 3 (Please specify)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q18 Which party, in your opinion, brings the most disputes to the DRB?

- Owners
- Contractors
- Other (Please specify) _____

Q19 What was the cost of the DRB process (absolute \$ value and/or % of project cost)? How does it compare to other alternative dispute methods that you have experience with?

Q20 What was the average time taken from initiation (referral to DRB) to resolution (DRB recommendation)? How does it compare to other alternative dispute resolution methods that you have experience with?

Q21 How effective is the DRB process in avoiding disputes?

- Extremely effective
- Very effective
- Moderately effective
- Slightly effective
- Not effective at all
- Other (Please specify) _____

Q22 How effective is the DRB process in resolving disputes?

- Extremely effective
- Very effective
- Moderately effective
- Slightly effective
- Not effective at all
- Other (Please specify) _____

Q23 What was your level of satisfaction related to the DRB process, results reached, and efficiency in terms of time spent and cost of the process?

- Extremely satisfied
- Somewhat satisfied
- Neither satisfied nor dissatisfied
- Somewhat dissatisfied
- Extremely dissatisfied
- Other (Please specify) _____

Q24 How have the interests of investors and the financing parties been incorporated into the DRB process? Have they been directly involved as a party to the DRB or invited to the DRB meetings (at least in the sessions involving financial issues)?

Model Evaluation Focus Group Sheet

MODEL EVALUATION					
EVALUATION ASSUMPTIONS	1. The project delivery method will be Design Build Finance Operate Maintain (DBFOM) 2. Assume the project has good P3 project governance/management practices in place 3. Assume the project has early selection of DB members and use for duration of projects 4. Assume contract agreement allows DB to handle any type of dispute (that is, both technical and financial) 5. Assume use of a DB Process (even though details may vary, such as separate technical and financial DRBs) 6. Assume only Owner, Concessionaire, DBT, O&M involvement, and <u>not</u> Financial Entities or Other Stakeholders are part of the DB Process				
Model Evaluation	Model 1.0 - Conventional DB	Model 2.0	Model 3.0	Model 4.0	Model 5.0 - Omnibus
	DB Process at the Concession Contract level only, with a standing invitation for the D&B Contractor and O&M entity to attend the Concession level DB meetings 	Three separate DB Processes, with one covering the Concession Contract, one covering the D&B Contract, and one covering the O&M Contract for the full term 	Two separate DB Processes, one for the Concession Contract, and one covering the D&B Contract and the early years of the O&M Contract 	One DB Process at the D&B Contract and O&M contract level 	One DB Process covering the Concession, the D&B Contract and the O&M Contract
Have you been involved in this DB arrangement before? (Yes/No)					
Using Model 1.0 "cost" (defined by out of pocket cost of DB Process) as a baseline, how does each other Model compare (e.g., lower, higher, same)? Justification? Please include actual cost range if available					
Using Model 1.0 time (defined by DB process time from dispute initiation to resolution) as a baseline, how does each other Model compare (e.g., shorter, longer, same)? Justification?					
How does the parties' participation in each Model impact (improve) the avoidance and resolution of disputes?					
What impediments/barriers would you foresee in implementing the DB Process in these various arrangements?					
How effective is the Model at bringing up all issues that might give rise to disputes within the overall P3 framework and contracts?					
Does the Model enable all relevant information and people to be available to/within the DB Process (e.g., including subcontractors, designers, lenders and financial entities)?					

APPENDIX C – DRBAID FINAL TOOL

Enclosed is the workbook excel sheet (DRBAID Final tool)