White Paper Objective:

The multiple project delivery methods that exist today each have their own advantages and disadvantages. Some procedures within the methods have also been proven to be effective when applied to most project formats, specifically transportation projects. In order to improve the overall capabilities of a transportation agency, it would be advantageous to seek out these effective procedures and gather them in purpose to refine the existing procedures of the said agency. Through our own methods we, The Center of Excellence in Project Management at the Department for Civil/Environmental Engineering at the University of Maryland, have done this very action. We have identified a multitude of best practices throughout the transportation construction industry and assembled them in a reviewable format in order to aid the Maryland State Highway Association (MDSHA). We conducted a thorough, comprehensive and objective literary review over many other state’s departments of transportation (DOTs) best practices involving each project delivery methods in use. In the following white paper review, we plan on achieving a few different objectives. Our first objective is to describe in detail what exactly we mean by the term ‘best practice’ and other related terminology. Our second objective is to describe what we found to be best practices in other states and to determine how those other states have employed them. Our final objective is to determine how the MDSHA could employ these techniques into their own repertoire in order to improve their overall effectiveness and abilities.

What do we mean by Best Practice?

Our definition for best practices is that they are effective strategies, techniques and procedures that are employed by an operating entity of a project in order to most efficiently handle a particular task or process. Through our research, we have broken down these best practices into three related definitions based on their validity. The definitions for these best practices are grouped as: Validated Best Practices, Model Practices, & Recommended/Suggested Practices.

Validated Best Practices are those that have been used by state DOTs and have been proven to yield good results on a regular basis. An example of a best practice that we have determined to be validated would be that training is needed in order for an agency to switch over to a new project delivery method. The reason that this practice was determined to be validated is because almost all states using construction manager-at-risk (CMR) as a project delivery method employed the practice, multiple sources of literature agreed that the practice was effective in all cases, and its application consistently yielded solid results.

The second definition, ‘Model practices’, are those that have been identified to work effectively by certain states but have not been uniformly applied by every state using a particular project delivery method. An example of a model practice used in CMR is that there should be a heavy emphasis on community involvement. The reason this is a model practice is because there are only a few states who stressed this practice as being integral to the effective delivery of a CMR project.
The final definition that we grouped best practices into, recommended/suggested practices, is defined as those that are recommended by professionals based on their observation, but have no real-world example to justify the effectiveness of the practices. The research group has suggested these practices may be feasible but currently we don’t have enough information to demonstrate their effectiveness or determine the efficiency of the practice. An example of a recommended/suggested practice is to minimize schedule driven design. This practice falls under the category because it has not adequately been applied to any state in particular but it has been recognized by some researchers as being a potential area of improvement for the CMR project delivery method.

What are the Best Practices?

After we established what a particular best practice was defined as, we further organized each practice into two main categories. Each of these main categories had their own subcategories in order to more accurately situate the practice for the MDSHA to internalize. We found that the two main categories that each practice fell into were either, Institutional/Political & Technical. From there, we broke down the Institutional/Political category into the subcategories of: Stakeholders and Public Engagement, Internal Affairs, & Program management. Additionally, we divided the Technical category into the sub categories of: Project Identification Procedures, Project Procurement/Development, Project Management, Project Design, Risk Management, Project Communications, & Construction Procedures.

We can start by defining the Institutional best practices as being practices that mainly apply to the overarching forces which lie outside of a specific ongoing project but instead in an area that influences the capabilities of an agency to efficiently perform any project.

Included in this category are Stakeholder and Public Engagement best practices. These are practices which specifically revolve around handling the people not directly involved in the construction of a project but still play an important role in the overall success of the project. An example of one of these types of practices that we discovered in our data collection was ‘Placing a heavy example of Community involvement’. This model practice was used by Arizona and Missouri in a number of interesting ways. The city of Phoenix Arizona’s DOT in particular created their own social media channels in order to broadcast information about the various projects they were currently involved in and how these projects were going to affect the public. Through this communication, they were able to answer comments and concerns from the population who would ultimately benefit from their finished work.

The second subcategory in Institutional best practices is that of ‘Internal Affairs’. This subcategory specifically relates to processes that an agency employs in order to enhance the general effectiveness of the organization when carrying out any type of project or internal operation. An example of a model practice that falls under this category is ‘Putting best people on the job and teaming with the best’. This practice was emphasized by the states of Florida and Utah. Specifically, the state of Utah mentioned that they feel comfortable with reducing the overall size of their staff if they have the right people working on the project at that time. By reducing the amount of staff, it also reduces the overall budget with which the agency has to manage. The final subcategory that composes the Institutional overall category is, Program Management. This subcategory category mostly handles the best practices that are associated with the process that an agency goes through when organizing and choosing the overall delivery
method for a certain type of project. An example of this is the recommended practice of ‘Having a DB champion and a DB policy committee within the agency’. This is currently being looked into in a number of states but has yet to be fully deployed in action. The function of this practice would be for the person who is the champion to serve as the single point of information for the DB program and an advocate for the delivery method. The committee would discuss DB relevant issues that affect departmental policies and procedures. This process would help smooth the transition that an agency makes from a previous project delivery method, like design bid build (DBB), into an alternative delivery method like design build (DB).

The second main category known as, Technical best practices, can be defined as those practices which are essential to the process of a specific project taken on by an agency. Included within this main category is the subcategory of ‘Project Identification Procedures’ the process which determines if a project is eligible to use the specific delivery method. Another subcategory within the Technical category is ‘Project Procurement/Development’. This deals with the tasks associated with the contracting of a project & the activities which plan and create a scope of work. An example of a validated best practice from our studies that fit under this category was for the ‘CMR to procure early work packages’. Both Utah’s and Memphis Tennessee’s DOTs used this practice in order to “mitigate cost risk by locking in the cost of the materials and services associated with those package” (Gransberg & Shane, 2010, p. 3). It was highly agreed upon by many experts and DOTs in the field that the earlier this action is executed, the greater potential for benefits to arise.

An additional subcategory Technical best practices are broken down into is ‘Project Management’. This subcategory deals with the different and specific management practices utilized in any of the alternative project delivery methods. An example of a best practice that falls into this slot is ‘The ultimate subcontractors who perform the work of the project should be selected by the CM/GC’. This model practice was utilized by a number of different states all of which determined this method to be much more effective than for the Agency to place significant intervention in this process. This practice was effective because among many things, it allowed the agency “to get real-time pricing information,[because] the CMR is able to communicate with the subcontractors it knows during preconstruction” (Gransberg & Shane, 2012, p. 68).

A third subcategory that composes the Technical main category is that of ‘Project Design’. The best practices grouped in this category are related to the efforts and work done in association with the design phase of a project. A specific example of a best practice that fits this category was that the project team should, ‘Correlate directly the design packages with the subcontractor bid packages’. This model practice was used by a number of states including Utah, Oregon and Texas, all of which praised its effectiveness. They mostly stated that this needs to happen in order to mitigate risk and fast-track the overall project. It can also greatly improve savings during the preconstruction process.

A fourth subcategory within the Technical main hub is the ‘Risk Management’ area. Best practices that are grouped in this subcategory are related to the assessment and engagement of risk. An instance of a best practice that fits this category and that was used extensively by Utah’s DOT was that of ‘Develop a quality management plan’. “The Quality Management Plan (QMP) is the document detailing all quality program procedures adopted by design-builders” (Minchin et al., 2014, p.121) and Utah required the DB to use this in order to ensure design package quality.

A fifth subcategory included in the Technical main category is ‘Project Communications’ area. The best practices that were included in this subcategory revolved around how project
participants are interconnected and how they transfer ideas, documents, and commands between each other. A case in which a best practice fit this category was that of the ‘Collaboration of CMR and Designer’ should be ensured. The Memphis Tennessee DOT specifically focused on this model practice because they claimed that “Doing this makes preconstruction collaboration enforceable and gives the designer the opportunity to set appropriate prices for the activities that do not occur in a DBB design project” (Shane & Gransberg, 2010, p.57).

The final subcategory that composes the Technical main category is ‘Project Construction’. Any best practice that made it into this subcategory dealt with the characteristics of construction in a given alternative project delivery method. One best practice that fits perfectly into this subcategory is that of ‘Use monthly reports along with invoices to ensure construction cost control’. This best practice was thoroughly used by Florida’s DOT in their Osceola County project and they claimed it to be one of their best practices to ensure that the construction cost was kept within budget. They described them as, “These gave detailed information on all costs to date and were compared to the schedule of values that had been approved for the project” (Minchin et al., 2014, p. 178) and they essentially worked by expediting the speed in which bids arrived, concerning the engineer’s designs on the project.

It should also be noted that while there were a few examples given in the previous paragraphs about the various best practices that were discovered, there is even more details available on a further number of best practices that was collected. This information is located in the attached appendix and includes mostly information taken directly from literary sources that were observed during the review. The more complex best practices are laid out in full detail in their original source, if it remains desirable to further investigate the best practices.

How to use the Best Practices?

To be able to use or employ each best practice that was discovered in the research, we need to consider Maryland’s current circumstances. These include such processes as legislation, MDSHA organization, past experience, and contractor characteristics in each district. The MDSHA should examine these circumstances and evaluate if they can accommodate the requirements for each best practice. The MDSHA should also list and evaluate the kinds of arrangements to be made in order to implement the best practice. It should also be noted that the MDSHA should take special care when implementing the recommended/suggested practices, as we have found no validated results. Each best practice has specific methods of implementation that should be learned by MDSHA officials in order to most appropriately employ the practice within the organization. If this is done properly, there are a range of immediate benefits that come from being able to employ these practices on future projects. Anywhere from decreasing the overall cost, to reducing the project’s schedule, to improving the agency’s public image can be achieved through the employment of these best practices. We hope that we can continue to assist the MDSHA with our final development of a guidebook that will break down each best practice in order for them to be most effectively understood within the administration.
**Technical Project Delivery Area:**

**Short Description:**

- Preconstruction Development
  - CMRS to procure early work packages
    - The CMRS to procure early work packages (typically materials to be installed by subcontractors) is reported to reduce cost and bidding during the cost of the materials and services associated with work packages. "Although they're very pre project, they are all typically done for CMRS based on early procurement issues as well as early work items." (Schierholz, 2012, p. 65). As stated by Duck/DOT construction starts sooner and the design process due to early work packages. (Minchin et al., 2014, p. 169).

- Reimbursed Public Engagement
  - Has contractor deal with permitting agency.

- Program Management
  - Use the Correct project delivery process

- Preconstruction Development
  - Early Selection of the CMR
    - The Early-DOT case study involves the selection of a permitting agency that would handle the permitting process. The project must be in place before the CMR can begin to select the CMR. The project involves the selection of the designer. An agency wants to retain a cost and fair selection process. The CMR selection point is a bit of contention because it has been completed to be the CMR. The project involves the selection of the carrying out of the selection process and the magnitude of quantities of work to be performed in the project. (Gransberg & Shane, 2010, p. 15). This idea is also supported by CMRS Guidelines for Public Works by AGC of America on page 30. This is the thought that is also mentioned on page 16 of selecting the preconstruction phase in a CMRS project by Minchin et al. 2014.

- Preconstruction Development
  - Process/Development
    - Ensure a documented procedure for selection of CMR.

- Project Development
  - Use of Best Value selection to select the CMR

- Internal Affairs
  - During selection of the CMR, make the process transparent to avoid abuse.

- Preconstruction Development
  - Cost Modeling: Should It Be Implemented

- Preconstruction Development
  - Transparency Evaluation of Opening Bids

- Project Management
  - Ultimate subcontractors who perform the work should be selected by the CMRS

**Example States:**

- NC DOT: high technology
  - Other have something written into the CMRS contract to ensure that the contractor does not have their design to conduct another with the CMRS. This practice is also further detailed on page 32 of Gransberg & Shane 2010.

- NA DOT: high technology
  - CMRS should be the best practice for ensuring the agency's interest is protected. This practice can be inserted into the overall guide that the agency employs in their preconstruction process.

- Project Management
  - Ultimate subcontractors who perform the work should be selected by the CMRS
  - The Synthesis also has a full report of UDOT's process that they employ in order to select the correct CMR and delivery method on pages 30-33.

**Vendor/State:**

- NA
  - Refer to pages 8 to 12 in the report by Minchin et al. 2016.

- DB
  - Referenced/Suggested practice not in use.

- CMRS
  - Not included in the CMRS manual.

**Validated RF, model practice, or recommended/practical practice:**

- Model Practice
  - Not validated.

- Model Practice
  - Not validated.

- Model Practice
  - Not validated.

- NA
  - Not validated.

- Model Practice
  - Not validated.

- NA
  - Not validated.

**Source:**

- Annual Category
- Project Delivery Area
- Best Practice Name
- Short Description
- Example States
- Possible Implementation/Process
- Source
- Application Area
- DB or CMRS
- Validated RF, model practice, or recommended/practical practice
- Already included in DB Manual?
Procurement/Development

The RFP for CM/GC projects should require a 30 to 60 day pre-JSA period and the required time period be front-loaded into the project schedule prior to allowing the contractor to begin actual construction. This will allow the design process to get ahead of the contractor as well as providing sufficient time for the Department to conduct its conformity review. This pre-award period must be clearly spelled out in the RFP so that the DB Entities can include it in their contract time calculations (Munsho, 2006, p.13).

Kenosha

This should be clearly inserted as a requirement into the RFP in order for both the designers and contractors to have enough time for the procurement process.

Cost estimating by the CM/GC firm is essential

Kenosha

Assign this task directly to the Contractor's contract.

Saratoga, Arizona

Assign this task directly to the Contractor's contract.

Procurement/Development

Assign the CM/GC to handle the entire ROW procurement process.

Nevada

Assign this task directly to the Contractor's contract.

Procurement/Development

Contingent design is understood as a design package with a subcontractor bid package.

Nevada

Assign this task directly to the Contractor's contract.

Institutional

Project Communications

Collaboration of CM/GC and Designer

The solution to ensure collaboration is to modify the design contract to facilitate CM/GC project delivery. Designing the entire procedures of collaboration and resolve the design conflicts to facilitate the change in a CM/GC project delivery identified (Shane & Gangih, 2010, p.17). This is not the only factor but the first and the most important. CM/GC project's design steps cost increases with this form of project delivery method. Instead, the building is just complete.(Munshi et al., 2014, p.78) This paper is from the Colorado county case study. The design group was allowed to form a joint committee to develop the design contracts and expenses for coordination costs and the CM/GC's final cost of the project.

Nevada, Utah

Munshi et al. (2014) identified that the CM/GC approach can be successfully applied to projects. This also allows the construction to begin before the entire design is finished allowing the CM/GC to handle the entire scope of work.

Nevada, Utah

This policy can be inserted into the overall guide that the agency should use to negotiate the RFP.

Nevada, Utah

This should be applied to bring in a major goal of the agency in negotiating the project.

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Saratoga, Arizona

Assign this task directly to the Contractor's contract.

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Assign this task directly to the Contractor's contract.
Technical Project Implementation

Institutional

Project Owners should provide absolute clarity on their goals. This can be achieved by a model practice that involves creating a database to maintain records of past projects. As stated in their case for Phoenix Arizona, “They (City personnel) are able to show why certain decisions were made as well as the reasons for the changes.”

N/A

Technical Project Management

Use of project management software/tools

All states are now aware of the critical importance of facilitating communication, accountability, and planning. Each state has its own version of the same tools. “UDOT has a web-based JIRA that was created by the study team or by each project team.” The state of Utah should be completely engaged and keep up-to-date with the project’s progress.

No

Technical Project Management

Use of GIS and Data Management Tools

Florida’s ETDM process was identified as a best practice. Florida’s逸 Dispersal of Effective Transportation Design-Making (EDTD) Process in order to encourage transportation planning and project development for future capacity improvement projects. The ETDM process mandates agencies and the public to participate in it. The Florida Department of Transportation (FDOT) and Metropolitan Planning Organizations (MPO) should attend potential of proposed transportation projects. The goal of ETDM is to make transportation decisions more quickly without sacrificing the quality of the human and natural environments.” (McMinimee et al., 2009, pg. 3-11) Many of these tools are acquired through outside consulting agencies or even through seeking for assistance from other states.

No

Technical Project Management

Use of GIS and Data Management Tools

Multiple

Technical Project Management

Use of Project Management Software/Tools

All states are now aware of the critical importance of facilitating communication, accountability, and planning. Each state has its own version of the same tools. “UDOT has a web-based JIRA that was created by the study team or by each project team.” The state of Utah should be completely engaged and keep up-to-date with the project’s progress.

Yes

Technical Project Management

Use of GIS and Data Management Tools

Multiple

Technical Project Management

Use of GIS and Data Management Tools

Many of these tools can be acquired through outside consulting agencies or even through seeking for assistance from other states.

No

Technical Project Management

Use of GIS and Data Management Tools

Multiple

Technical Project Management

Use of GIS and Data Management Tools

Multiple

Technical Public Engagement

Place a heavy emphasis on Community Involvement

The Best Practices the scan team observed reflected that community involvement is not a singular moment, but a project-long effort. Each transportation agency visited reported that they supply to the DB builder. (Ghavamifar, 2009, p.123). In particular, UDOT even made their own social media channels that publicize it to other departments of the agency.

No

Institutional Internal Affairs

Internal Affairs

Internal Affairs may need to stay involved

The internal participants and collaborators to a great extent with the other project team members to administer and coordinate the CMRC process, or they should be involved in the project scope, manage the project budget, and execute and negotiate contracts for project deliverables. “They are not only responsible for the construction and design phases of a project, but the maintenance and repair of the project as well.”

No

Institutional Internal Affairs

Internal Affairs

Internal Affairs may need to stay involved

As stated in their case for Phoenix Arizona, “They (City personnel) are able to show why certain decisions were made as well as the reasons for the changes.”

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No

Institutional Internal Affairs

Internal Affairs

Assign the responsibility of coordinating with the Feds to the CMR

The internal affairs team of the project should have the authority to make decisions, “especially with the use scoring method and some approach in 2004.”

No

Institutional Institutional

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Program Management

These should be co-location of the entire team of professionals from the contractor, designer, and the state agency.

As stated in their review on the Arizona DOT, “DOIT believes that “the entire team” should be co-located between Phoenix and Construction (CM) and AGAC has not avoided co-location or housing of the DB firm key staff and itself engage team to improve communication within the DB delivery system (CM) as it was stated by Minchin et al. (2014, p.174). Both the owners and the designer/builders should be co-located in order to ensure a greater sense of owner oversight of the project and better parallel decision-making between the two [KDLG] (Gransberg & Shane, 2010, p.7) "This reduces the risk to the constructor and the amount of contingency that the CMR

Program Management

When taking the first steps to implementing DB, owners must address that formal and informal cultures alike. It is also critical to allocate the DBR and contractor about this change in culture.

To foster meaningful organizational change, agencies must address their formal and informal cultures alike. Without attention to Shaping these two organizational cultures, agencies are likely to see opportunistic behavior (Minchin et al., 2014, p.11). “When an agency is procedurally rooted in traditional means and methods, it is unlikely to face varying degrees of innovation in delivery approaches. Instead, the agency’s formal culture should be one of innovation, risk-taking, and improvement of the status quo” (Minchin et al., 2014, p.11) “Shaping the agency’s informal culture must support an innovative project delivery method for the second half. Informal culture consists of the way an agency actually runs with time, apart from procedures and policies.” (Minchin et al., 2014, p.14)

N/A

Institutional Affairs

This contractor should be present when dealing with third parties.

About referring to Third-party agreements and CMR: “An example, entering the agencies interviewed in this research, one strongly emphasized the benefit of having a common contract on board while negotiating with third parties (Utah: Consumer Affairs). In general, the CMR’s knowledge of construction processes and sequencing can help clarify various aspects of projects impasse on communications and mitigates, may help identify facilitators seeking understanding and appreciate,” (Minchin et al., 2014, p.66). A few recommended site reports by Minchin et al. “Exhibit, only a few agencies reported where the CMR, was not really part of the team for keeping things fairly between the parties. Particular coordination with appropriate agencies and stakeholders is not specifically important during the project (Minchin et al., 2014, p.66) N/A

Technical

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N/A

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N/A
Procurement/Development

In order to establish a GMP, it is necessary to use unit prices rather than component-wise unit and price. (Yielding & Steak, 2011, p. 39) This strategy has been shown to be effective by the City of Phoenix, whose current practice is to establish a unit price for each item through a unit price system. (UTA, 2013, p. 213)

The use of unit prices is recommended to reduce the complexity of the GMP calculation. (AICM, 2012, p. 121) The use of unit prices allows for a more straightforward and transparent process, which can lead to a more accurate and fair estimation of the GMP.

Procurement/Development

Agree first on quantities when dealing with cost and pricing. By dealing with this issue early and directly, a potential area of conflict can be avoided. (Minchin et al., 2009, p. 3-7)

This strategy can help to establish a clear understanding of the cost and pricing model, which can lead to a more efficient and effective contract negotiation process.

Procurement/Development

During the GMP process, the CM should open up information to the owner. (Mukherjar et al., 2009, p. 79)

The open sharing of information can help to establish a more transparent and fair contract negotiation process, which can lead to a more efficient and effective contract negotiation process.

Procurement/Development

Assign this task to the Contractor’s contract. (Mukherjar et al., 2009, p. 79)

This strategy can help to establish a clear understanding of the CM’s role and responsibility, which can lead to a more efficient and effective contract negotiation process.

Risk Management

Develop a quality management plan for the project. (FDOT & FHA, 2002, p. 7)

The establishment of a quality management plan can help to establish a clear understanding of the quality expectations and requirements, which can lead to a more efficient and effective contract negotiation process.

Risk Management

This should be a relative goal of the agency. (Minchin et al., 2009, p. 3-7)

This strategy can help to establish a clear understanding of the agency’s goals and objectives, which can lead to a more efficient and effective contract negotiation process.

Program Management

CM to buy into the design. (AICM, 2012, p. 121)

This strategy can help to establish a clear understanding of the CM’s role and responsibility, which can lead to a more efficient and effective contract negotiation process.

Institutional

Make sure DOT uses the cost validation and itsreflect the current market conditions. (FDOT, 2014, p. 213) The need to revise the ICE/contractor’s cost model to reflect current market conditions can help to establish a more transparent and fair contract negotiation process, which can lead to a more efficient and effective contract negotiation process.

Technical

This should be applied to being a major goal of the agency who is heading the project. (Minchin et al., 2009, p. 3-7)

This strategy can help to establish a clear understanding of the agency’s goals and objectives, which can lead to a more efficient and effective contract negotiation process.

Technical

Many of these tools can be acquired through outside consulting firms. (Ramirez et al., 2014, p. 64)

The use of outside consulting firms can help to establish a more transparent and fair contract negotiation process, which can lead to a more efficient and effective contract negotiation process.

Technical

When selecting the CM, a thorough understanding of the agency’s requirements, the agency requires the Design-Builder development of a quality management program. (Minchin et al., 2009, p. 3-7)

This strategy can help to establish a clear understanding of the agency’s requirements and expectations, which can lead to a more efficient and effective contract negotiation process.

Technical

Use same QA program as DBB. (Minchin et al., 2009, p. 3-7)

This strategy can help to establish a clear understanding of the agency’s requirements and expectations, which can lead to a more efficient and effective contract negotiation process.

Technical

This can increase disputes over assumptions of what remaining design features could be so significant where it would be impossible to recovery from if it not properly planned. (McMinimee et al., 2009, p. 3-7)

This strategy can help to establish a clear understanding of the agency’s requirements and expectations, which can lead to a more efficient and effective contract negotiation process.

Technical

Assign this task to the Contractor’s contract. (Mukherjar et al., 2009, p. 79)

This strategy can help to establish a clear understanding of the CM’s role and responsibility, which can lead to a more efficient and effective contract negotiation process.

Technical

Simplify the process of establishing a reasonable and realistic GMP as much as possible. (AICM, 2012, p. 121)

This strategy can help to establish a clear understanding of the GMP calculation process, which can lead to a more efficient and effective contract negotiation process.

Technical

The most effective quality management plans will be those that are focused on ensuring that the agency’s goals and objectives are met and that the project is delivered on time and within budget. (Minchin et al., 2009, p. 3-7)

This strategy can help to establish a clear understanding of the agency’s goals and objectives, which can lead to a more efficient and effective contract negotiation process.

Technical

The added risk can come from wide range of areas but it should not be so significant that it would be impossible to recovery from if it were to actually occur. (Minchin et al., 2009, p. 3-7)

This strategy can help to establish a clear understanding of the agency’s requirements and expectations, which can lead to a more efficient and effective contract negotiation process.
1. Justify the selection of design-build delivery for the project on the 
    basis of one of the following

   a. Cost savings result from a shorter construction cost due to parallel engineering and development.

   b. Project will be of the same quality as competitive single-phase designs.

   c. Project will be completed in a shorter time than competitive single-phase designs. Costs will be lower.

   d. Other factors such as environmental impact, aesthetics, or sustainability.

   e. Flexibility in changing design during construction.

   f. Ability to take advantage of off-site construction.

   g. Better project team coordination.

   h. Improved project performance due to increased competition.

   i. Better project management due to direct involvement of owner and contractor.

   j. Greater owner satisfaction due to increased participation.

   k. Other factors that make design-build delivery more appropriate for the project.

   2. From this justification, establish project goals for schedule, cost, 
      quality, safety, and environmental impact.

   a. Develop a project timeline that includes key milestones.

   b. Establish a budget that allows for unexpected costs.

   c. Define clear quality standards and ensure compliance during construction.

   d. Develop safety plans and regular training programs for all project personnel.

   e. Address potential environmental impacts early in the project planning process.

   3. Rank these goals in order of importance.

   a. Prioritize goals based on the project’s requirements and constraints.

   b. Communicate prioritization to all stakeholders.

   c. Allocate resources to meet the most important goals.

   4. Publish the goals in the RFQ and RFP.

   a. Include all project goals in the RFQ and RFP documents.

   b. Ensure that all potential proposers have access to the RFQ and RFP documents.

   5. Using best-value procurement, develop evaluation criteria that 
      reward proposers for meeting or exceeding the project goals.

   a. Establish evaluation criteria that reflect the project goals.

   b. Use a scoring system to evaluate proposers based on their achievements.

   c. Consider cost, quality, schedule, and innovation in the evaluation process.


   a. Preliminary process: contractors submit concepts for preliminary approval.

   b. Formal process: concepts are revised and finalized before implementation.

   c. Benefit: Opportunity for smaller / risk averse consultants / contractors to participate;

   d. NCDOT bundles roughly 400 small bridge projects that into 39 contracts.

   e. North Carolina DOT published a list of 20 projects.

   f. Decision was made by the Design Build Group and the General Consultants.

   g. Colorado, North Carolina: Preliminary and final processes.

   h. Oregon: Two-step process.

   i. Minnesota DOT: The final package includes a provision for contractors to be shortlisted.

   j. Washington State: The Department of Transportation submitted the request for proposals.


   l. New Jersey: The DOB issued an RFP to select the design-build contractors.

   m. Arizona, Colorado, Florida: The DOT/USDOT guidelines and manuals.


   o. Example states to disseminate the DB manual.

   p. Example states to be listed.

   q. Example states to be listed.

   r. Example states to be listed.

   s. Example states to be listed.

   t. Example states to be listed.

   u. Example states to be listed.

   v. Example states to be listed.

   w. Example states to be listed.

   x. Example states to be listed.

   y. Example states to be listed.

   z. Example states to be listed.

   AA. Example states to be listed.

   BB. Example states to be listed.