



ADOT Process Improvement Review Report

Construction Manager at
Risk (CMAR)#

RH & Associates, Inc.
November 2012



ADOT Alternative Project Delivery Lessons Learned Report (CMAR)

Introduction

In a continuing effort for ADOT to improve their internal processes related to Alternative Delivery projects, RH & Associates, Inc. under contract with Jacobs, has completed a review of three CMAR projects; Cordes Junction Traffic Interchange, Loop 303 Peoria to Mountain View, and the Loop 303 Cactus-Waddell-Bell Traffic Interchange, to look for opportunities to improve the current process as well as confirm elements of the process that are going well. Input was solicited from team members from all three projects and included ADOT, the APDM consultants, design consultant and the CMAR contractor. The following specific questions were asked of all of the participants:

- 1) What changes would be beneficial within the RFP documents, related to the success or impact to the project?
- 2) Provide any comments on how the panel selection worked and did it impact the project. Would you have any improvements that would help future selection panels?
- 3) What improvements or changes need to occur during the pre-construction services portion of the project?
- 4) What challenges occurred/occurring during construction (i.e. payment issues, process improvement issues)?
- 5) How was the design review process, including comment reconciliation? (i.e. contractor comments, flexibility in approaches, etc.) What worked well and what improvements would you make?
- 6) How was third party involvement on the project? Were there challenges that impacted the project? Could their involvement be managed differently?
- 7) How effective was the subcontractor selection process? What, if any, changes could be made to improve the process?
- 8) How was the negotiation process during the GMP handled? How was the timeliness of reaching the GMP? Any suggestions or comments to make improvements?
- 9) Were there any challenges with the allowance process (determining the allowances and using them during construction)? Were there any specific traffic control issues and what suggestions do you have for future D/B projects?
- 10) What benefits can you identify using a CMAR contracting method versus traditional? And why?
- 11) How did the independent cost estimate process work with your project? Any suggestions for improvements?
- 12) What partnering did you do on the project? How effective was the approach? Would you do anything different?
- 13) Were there any challenges during the design process with internal ADOT sections? If so, what were they?
- 14) How was the innovation and opportunities matrix used on the project? Was it a benefit for the team?
- 15) What change orders occurred on the project? What was the cause of the change orders; design issues, unforeseen conditions, etc.?
- 16) Any other comments or suggestion might you have to improve future CMAR projects?

From this information, the following suggestions, alternatives, and comments are provided to help ADOT to improve their current processes. Additionally, other recommendations are made based on additional information obtained from Best Management Practices from other agencies, as appropriate.

This report is divided into the following categories:

- RFP and Selection Process
- Pre-Construction Services
- Construction/Change Orders
- Partnering
- Miscellaneous

Observations

The responses to the questions posed to the various team members were overwhelmingly positive related to the effectiveness of the CMAR process. There were several areas that were identified as needing improvement, but overall the largest concerns related to understanding the CMAR process in lieu of the Design-Bid-Build process or even the Design/Build process; the transition from pre-construction/design to construction; involving the right individuals in the process at the right time; and consistency of personnel (both from the CMAR and ADOT).

RFP and Selection Process

It was identified that the RFP documents were well prepared. The overall process appears to be working well, except as noted below.

RFP and Selection Process

- 1) **CMAR selected earlier in the process** – it was identified by several entities that it is critical to bring the CMAR in earlier in the design process.

Potential Opportunities for Improvement:

- a. Specifically it was identified that the optimal timing is before the development of the Stage III design plans.
- b. It was defined that the CMAR should be under contract by this time, not just going through the selection process.

- 2) **Statement of Key Personnel Commitment** – One of the benefits of the CMAR process is the continuity and consistency of team members from pre-construction services through construction. Many decisions are made during design that impact construction. If key personnel from the contractor or ADOT continually change or are not included in the process, this is lost on the project and the team.

Potential Opportunities for Improvement:

- a. Within the RFP documents, have the contractor commit to key personnel to be involved throughout the project and that an approval of a change has to be approved by ADOT.

- b. This could also be true of ADOT/CM personnel assigned to the project. Commitments are needed during the design portion for construction so that ADOT/CM staff are involved during the pre-construction/design phase. (Additional information is provided within the Pre-Construction/Design Services section of this report.)

3) Clearly Defined Scope of Services and Responsibilities – A very generic comment was made which seems to point to the possible misunderstanding of roles and responsibilities and continues to support the need to hold the design scoping/partnering meeting to help identify the expectations.

Potential Opportunities for Improvement:

- a. The comment made may impact the overall pre-construction services contract. If the CMAR is not sure what is expected of them, negotiation of hours may be difficult for them to understand the level of effort. It is suggested that the pre-construction/design scoping/partnering workshop be scheduled prior to the CMAR contract being negotiated or as a part of the negotiation, so that the scope and level of effort and the expectations of roles and responsibilities can be discussed and understood. This could be included as part of the negotiation process and should be expressed in the RFP documents as a process expectation for the CMAR to attend.

4) Selection Panel – The selection panels for the CMAR projects appear to be very effective with a fair approach and with a good mix of panel members knowledgeable in the construction industry. It was noted that the panel members should all have the same voting power. The only specific comment shared was the potential to include the Resident Engineer on the panel.

5) Pre-Construction Services Contract – It was identified that the process to get the CMAR actually under contract took way too long. There was also mention that there was some confusion on how to confirm costs.

- a. ADOT may want to look at the actual process for contracting and identify the challenges and make improvements to the internal process. This should include a process for identifying how costs will be evaluated and this information should be shared in the RFP document so that those proposing will know what is expected of them.

Pre-Construction/Design Process

Overall Comments

The majority of issues and concerns with the process appear to be during the pre-construction/design services phase of the projects. However, this would be consistent with many CMAR/CMGC programs with DOT's around the country. The pre-construction/design phase is the true difference with the process and if managed correctly, the most benefit to the overall process. This phase requires a completely different attitude and process approaches than a traditional design/bid/build project and thus can lead to having the most challenges. The following elements were identified as needing improvement in the current ADOT process:

1) Understanding the CMAR Process – As mentioned in the Comments above, this was mentioned throughout the various statements made by the team members. There still

appears to be a gap in understanding the differences between CMAR and a traditional design/bid/build or design/build project.

Potential Opportunities for Improvement:

- a. Many of the comments from several of the team members were targeted within ADOT and the design teams; that they still do not understand the CMAR process and additional training and understanding is needed to educate team members. However, based on some of the comments, I would also contend that the contractors also need to be educated as to the process and expectations of what will be obtained from the process and why CMAR is different. This training might be included during the pre-construction/design scoping/partnering workshop. However, the key is that all of those involved need to be in attendance of that workshop.

2) Involvement in the Process – Not having the right individuals involved in the process during the right time is leading to challenges during the process. Comments were provided from Resident Engineer’s that stated “they were not involved enough yet in the process”.

Potential Opportunities for Improvement:

- a. It is critical that those involved in construction should be involved during the pre-construction services phase. Critical decisions are made regarding design approaches and constructability issues that will make a difference in construction. The following is a suggested list of those that should be involved during the pre-construction phase:

ADOT

- i. Project Manager
- ii. Resident Engineer
- iii. Design Leads (Roadway, Structures, Right of Way, Utilities, Environmental, etc.)
- iv. District Engineer (as needed – not full time)
- v. Public Outreach

Designer

- i. Project Manager
- ii. Design Leads (including major subconsultants)
- iii. Public Outreach

CMAR

- i. Pre-Construction Services Manager
- ii. Project Manager (Construction)
- iii. Superintendent (as possible – not full time)
- iv. Lead Cost Estimator
- v. Field Engineers (as needed – not full time)
- vi. Any Subcontractors required during design

An additional comment was provided related to making sure there was a Land Surveyor involved during pre-construction services. See the Miscellaneous category of this report.

- 3) Schedule** – many comments were provided as to the lack of control over the design schedule and the design teams missing design milestones, leading to extended schedules and increased costs for the CMAR. There appeared to be a lack of urgency related to getting the projects designed and into construction. Additionally, design changes were allowed until deep into the design, leading to continual changes and concern with reaching the final GMP.

Potential Opportunities for Improvement:

- a. As part of the expectations of the project, the team needs to identify at the beginning of the project as to whether the schedule is critical to the project and the potential impacts to the project, in any, for not meeting the schedule. This will ensure that all parties understand the project drivers.
 - b. The roles and responsibilities of the various team members must be better understood. The role of the project manager for VMP needs to be better defined and expectations developed related to their role in managing the design schedule. This includes understanding the impacts of schedule slippage in both pre-construction and construction.
 - c. One of the challenges identified with the schedule also related to design changes being made late in the design process. Not only did this impact the schedule and design, it also impacted the contractors' ability to establish a GMP that was not a moving target. The project manager needs to take a stronger role and establish and manage the expectations of the participants from ADOT and third parties and identify a cut-off date when design changes will not occur.
 - d. One other element is to understand who is in charge of the schedule. In other CMAR projects, the designer and ADOT would provide their design schedule to the CMAR for them to integrate it into the overall schedule. So a discussion must occur as to what the overall schedule, including construction, is to be and then that schedule is updated and managed by the CMAR. They must be given the authority to address the designer and ADOT during pre-construction services and ensure that the schedule stays on track. The other the team members should look to keeping to that schedule, or as something slips, to establish a make-up schedule to try and get back on track.
- 4) Roles and Responsibilities** – There appear to be misunderstandings of roles and responsibilities or at a minimum, expectations tied to the various roles and responsibilities. This includes the ADOT PM, ADOT C&S, CMAR, design team and decision-makers. Part of this challenge may also be related to trying to fit design/bid/build processes into the CMAR process related to roles and responsibilities. As discussed above, additional comments were made regarding the commitment of the ADOT project manager to take a lead/driver role in the process.

Potential Opportunities for Improvement:

- a. Internally, ADOT needs to establish a strong training program for CMAR and the process differences required for a CMAR project. This should include training that helps a project manager and all staff members to better understand their role and what taking the lead means related to the various project elements and processes.

Project Managers selected for a CMAR should be ready for this type of delivery method, not just thrown into the mix.

- b. Evaluate the current processes and ensure that they are not in conflict with delivering a CMAR project. If there are challenges, change/develop new processes to ensure success.
- c. ADOT should embrace using the scoping session at the beginning of each CMAR project to make sure that roles and responsibilities are discussed with all participants to make sure there is an understanding of the various roles on the project. This discussion should include a discussion of expectations of the roles and responsibilities from all parties.

5) Payment – The length of time that it took to get the pre-construction contract completed on one of the CMAR projects delayed the first draw payment for 6 months. This ADOT internal process needs to be improved.

6) Cost Estimates – This process appears to be a big struggle with some teams, including the benefits of using an independent cost estimator (ICE). The process struggles included comparing the different cost estimates, quantities, and allowances. However, it was identified that the various cost estimates were beneficial to ensure that the prices provided from the CMAR were reasonable.

Potential Opportunities for Improvement

- a. Different comments were provided regarding the level and timing of involvement of the ICE. It was recommended that they need to be involved earlier in the project so that they understand the expectations and the project better. It was also suggested that the ICE should not be a contractor's competitor and truly should be independent. There are a couple of challenges with getting an ICE that truly understands construction (often the construction management firms have never really been a contractor). Additionally, there should be an understanding of local area, conditions, market prices, and they should have an understanding and familiarity of constructability discussions and the task meetings that occur to better understand the decisions made, etc. It appears that in some instances, historic data was used not current conditions or costs. One other comment made was that the ICE should actually bid the project independently in lieu of just reviewing the costs. This will however increase costs to ADOT.
- b. It is suggested that a formal process be established or updated, including criteria for selecting an ICE.
- c. During the early stages of pre-construction, a separate meeting should be held to establish the cost estimate format, including quantities to be included, etc. This meeting will help to avoid the challenge of trying to compare three different cost estimates. The designer, ADOT, contractor and ICE should be in attendance to develop the approach.
- d. Using an ICE process requires additional time for the design team, make sure there are hours included in their scope of services to accommodate this extra time.
- e. The designer and CMAR should establish the final bid items and descriptions.

7) Completeness of the Design – Numerous comments were made related to the level of design needed, errors and omissions, comments such as “we'll take care of it in construction”, and level and timeliness of reviews by both CMAR and ADOT. Additionally, errors and omissions were not corrected prior to the project going to construction in several instances.

Potential Opportunities for Improvement

- a. Internally, ADOT needs to determine what the minimums are that must be included in the final PS&E for the CMAR to construct. The team needs to decide, during the process, what level of design is required as it impacts allowances and the final GMP.
- b. The team needs to decide what is included in the CMAR's final scope related to the GMP. There were several discussions around "scope" versus the "at risk" portion of the contract. The team for each project needs to define a change and what will be acceptable, prior to construction beginning. This will avoid many of the arguments that are encountered in construction.

8) Design Process– There still appears to be some challenges with being open and flexible to the contractor's input during design. Collaboration appeared, at times, to be a challenge. However, it appears to be dependent on the specific design firm and may even be more specifically related to the design project manager. Additional comments related to the need for involvement of decision-makers in the process were also shared. One last comment made related to other ADOT internal departments such as Right of Way and Roadside Development. Right of Way clearances (cultural and environmental) were not done for a portion of one of the projects, delaying the GMP by several months. There was no sense of urgency at all for the work that was required from them. Comments related to Roadside Development related to constant changes in scope, with no budget.

Potential Opportunities for Improvement

- a. As discussed in a previous section, the design consultants working on CMAR projects should be required to attend the same training as ADOT staff. In fact, joint training may be a great opportunity to ensure all parties hear the same information.
- b. The challenges with understanding the need to work differently in a CMAR process is discussed elsewhere in this report, however, it is important to again state that the current processes for right of way clearance, design input, and timing of changes should be addressed in the training for ADOT staff to understand that the CMAR process is different. At the beginning of a CMAR project, the processes may need to be reviewed with the current team members to discuss how and when the work is to be accomplished to ensure that it meets the established schedule and the needs of the particular project.
- c. Specifications that cater to the CMAR delivery method are needed.
- d. Contractors want to get to the construction portion as quickly as possible, as that is the work where they will be profitable and it's what they do. A little more time may need to be provided within the RFP documents related to "estimated design schedules" so that reasonable design schedules are provided which allow for appropriate agency reviews. This should be discussed at the initial scoping/partnering workshop as well.

9) Design Review – The C&S review process is very cumbersome. It is taking too long and appears to be the same process as a traditional D/B project. Additional comments provided related to other reviews as being treated just like a traditional bid or a design/build project as well. The benefits of CMAR are not being realized as much as they could be and at times, it appeared, that the CMAR's comments were not included or considered in the final design or the comments just lagged from being included. There were some positive comments as well as to how the issues were tracked and responsiveness from the designer.

Potential Opportunities for Improvement

- a. ADOT may want to review the current design review process and ensure that it is not creating challenges to the CMAR process. ADOT may want input from contractors and design consultants in this process. The new process should then be rolled out to all ADOT staff and design consultants.
- b. It is important that contractors also understand their roles in this process. There may need to be some training that ADOT and the AGC could sponsor to ensure they know and understand their roles in the formal review process related to constructability, bidability, etc.

10) Third Party Involvement – As with most projects, the utilities continue to be a challenge. However, using the CMAR process seemed to work better with the utility companies. They were involved with the entire team, however, when schedules are aggressive, it is difficult to get their buy in to accommodate the schedule. The TSM meetings were successful and helpful for the team.

Potential Opportunities for Improvement

- a. The level of utility impact or involvement may need to be one of the deciding factors as to which projects should use the CMAR delivery method. Although ADOT may want to use the process, if third party individuals, including utilities, are not committed to meeting the schedules, this becomes a huge frustration for all team members and the design schedules will constantly slip.
- b. Encourage the use of monthly progress meetings to continue to involve third party stakeholders.

11) Value Engineering – Several positive comments were made regarding the use of a formal value engineering process. It was described as being very productive.

Potential Opportunities for Improvement

- a. For two of the projects, a specific Risk and Value Engineering for CMAR process was followed. It will be important to continue to ensure that processes meet the needs of the delivery method and not just use traditional methods. The involvement of the entire team, including the CMAR is critical to the success of this process.
- b. Other program requirements need to be considered. As an example, although the project is a CMAR, if it included federal funds, the FHWA requirement for a formal value engineering workshop may need to be met.

12) Allowances – Numerous comments and challenges were identified with the current use of allowances. It is understood that allowances are necessary on any project as well as CMAR projects. The process by which the allowances are developed and agreed to needs to be better defined or an actual process established and put in place. There appeared to be some challenges with allowances related to materials; setting up the allowances, being able to realistically calculate how much was needed and then being able to track them easily during construction. Additionally, the detail provided in the specifications and the plans need to be thoroughly understood so that as the CMAR is putting together the GMP, allowances are not used to “cover” things not included or detailed enough to quantify. Several recommendations were provided for allowances.

Potential Opportunities for Improvement

- a. It is recommended that the design team be involved with the development of allowances, part of the reasoning is related to making sure that the allowance items were not already covered in the bid items, but this should be covered with the independent cost estimator in lieu of the designer, unless there was not an independent cost estimator on that particular project.
- b. Provide allowances for traffic control and potentially for sediment wattles, where the quantity is likely different in the field than planned.
- c. Allowances need to be defined clearly and it should be determined whether or not they are truly needed. If the design plans and specifications are completed as necessary with the contractor's input, the team should be able to develop the actual costs and it should be able to be included in the GMP.
- d. One other example that is being used, but it is more related to a type of contingency, is a "risk contingency plan". Both NDOT and CDOT are doing a risk analysis, and for those elements that will need to be dealt with during construction, they are knowns, but the impacts are not known, they have developed a special contingency specifically tied to those risks. This allows the team to develop a contingency plan before it goes to construction and everyone knows exactly what the funds will be used for in advance. This approach seems to be working very effectively with both of these agencies.

13) Subcontractor Selection Process – In most instances, the subcontractor selection process in all of the CMAR projects worked well and went smoothly. Many comments were provided as to the care that was taken in the process. A few comments were made related to the lack of involvement of the resident engineer and C&S in the process and another comment about the fact that most of the quality issues encountered on the projects were related to subcontractor work and potentially there should be more of a focus on qualifications for the subcontractors for certain areas of work.

Potential Opportunities for Improvement

- a. Having the resident engineer involved in the process is probably beneficial to the project. They are often familiar with subcontractors and their ability to perform the work being proposed. However, it is not clear how the involvement of C&S would potentially benefit the process and might even make the process a little more difficult.
- b. Based on the comments provided, if the subcontractors are truly being selected with qualifications, the only recommendation that might be provided is "are the right questions being asked" of the subcontractors and are they being forthright in their answers to the questions. This might be a good process for ADOT and the AGC to spend some time working on in a joint session.

14) GMP Negotiation Process – Overall the process as a whole seemed to be successful. There were a couple of issues related to the timeliness or the lack of urgency to get the GMP finalized and that discussions were centered around quantity reconciliation. There were also comments about who should be involved in the negotiation process.

Potential Opportunities for Improvement

- a. The concerns provided related to the length of time for negotiation and several issues about impacts to staff for the CMAR as well as their commitment of resources for a project that was expected to start sooner rather than later. This might be addressed in the discussion of the roles and responsibilities section and the project manager's role in ensuring that this effort is completed in a timely, fair and effective manner. (See Roles and Responsibilities, Item #4)
- b. A comment was provided from the design team that they should be involved in the negotiation process to ensure that the contract bid tab, work descriptions, force accounts and allowance decisions are accurately reflected in the final PS&E. However, this may not be the best approach, it is recommended that this type of detail be worked out with ADOT, design and CMAR prior to ever getting to the negotiation point. As recommended in the Cost Estimate comments above (Item #5), a separate meeting to identify all of this information would be much more beneficial. One of the ADOT project managers also stated that they were not involved in negotiations and thought they should have been. If the project manager is responsible for the project all the way through the project, their involvement might be needed in the negotiation process. This entire process approach may need to be reviewed and improved; to include scheduling/timing, attendance, and preparation.

15) Transitioning from Pre-construction to Construction – In at least one project, there was an extraordinary amount of turnover on the job between the pre-construction and construction phases. It was uncharacteristic for either organization. The challenge with this for the future is the impact it has on the project, which ultimately suffers, or at least doesn't perform as well as it could have. The project suffers from the lack of knowledge transfer from key decisions that were made in the design process that affected construction.

Potential Opportunities for Improvement:

- a. This seems to be a challenge with many teams across the country. Much of the efforts in the pre-construction phase are lost during construction, related to relationships, knowledge transfer, etc. This is occurring for both contractors and ADOT. In order to continue to take advantage of the CMAR process, ADOT may want to look at the way that they assign staff members and the commitments being asked for by the contractor in their proposals. Obviously staff leaving the organization cannot be helped, but randomly changing key personnel may be something to be discussed and commitments made. The other item related to this is addressed previously within the report, and that is including the right people within the various phases.

Construction Process

- 1) **Change Orders** – Many comments were provided regarding the fact that there were still numerous change orders, however, it was stated that it was less than a traditional bid project. Many of the change orders were related to design changes, added work, errors and omissions and unforeseen/differing site conditions. In one project, that is on-going,

60% of the unforeseen conditions appear to be an omission from the pre-construction process. One other comment is related to having to provide a change order for any increase in planned quantities because of the GMP.

One other element that continues to be a challenge or constant discussion for CMAR projects is being able to truly define what is a change or what is or should be an “at risk” to the CMAR firm or what should have been identified during pre-construction services that should not be a change order to the project.

Potential Improvement Recommendations

- a. One comment received is about trying to come up with a process that allows minor increases in quantities to be allowed without having to do complete change orders. There seemed to be quite a few changes due to this fact.
- b. Additional education of team members on tracking quantities, paying items and understanding change orders to ensure that all team member are on the same page related to how this works in a CMAR process is needed.
- c. The challenge with CMAR projects and having a GMP is that the expectation for the CMAR is that they do their due diligence during the pre-construction phase to eliminate potential change orders during construction. Just like with the designers, there is no perfect way to ensure that there are no changes, project elements and items are missed during the design process, so unless specific language can be incorporated into the definition of “at risk”, it is difficult to define this once a project has begun. When there are errors and omissions on a project it is easy for ADOT to just cover the costs, so how can you not penalize the design team but you want to penalize the CMAR firm. A further discussion within ADOT needs to occur related to this approach. This also might be a good joint discussion with AGC and ADOT and an opportunity to develop some standard understanding or language.

- 2) Payment Process** – Payment for mobilization appears to be a challenge with the current process. Normally a project would allow for a percentage (%) to be billed. The CMAR project did not allow for a percentage to be billed so the mobilization costs were actual costs, thus the contractor had to use their own capital to start the project. The challenge with this approach is that smaller contractors may not be able to accommodate these costs. Additionally, price adjustments were required related to aggregates, reinforcing steel and concrete which seemed to cause more paperwork than a traditional bid project. Calculating tax and overhead items added work to ADOT staff during the payment process.

Potential Improvement Recommendations

- a. ADOT may want to look at how mobilization is paid and see if there is an opportunity to be flexible with this item of work.
- b. According to the comments, adjustments have been made in the most recent CMAR documents, so it appears improvements have already been made to cover the price adjustment comments above.

Partnering

All of the teams identified the need for Partnering and the effectiveness of the partnering throughout the project. The pre-construction services partnering was very effective as well as all of the follow-on workshops and discussions. Partnering should continue in a formal manner.

Potential Opportunities for Improvement:

- a. The only suggestion is to ensure that the pre-construction services scoping/partnering workshop continue to focus on the pre-construction elements of the project. A specific agenda should be geared around this type of workshop. However, it is important to understand that someone facilitating this type of workshop will need to understand the topics to be discussed and know the questions to ask to make sure that the elements discussed during the session are truly relevant to the issues relating to a CMAR project.
- b. A list of sample topics are provided below:

- CM at Risk Process Expectations
- Partnering Expectations
- Communication Plan
- Roles & Responsibilities
- Issue Resolution Process (During Design)
- Develop Project Goals
- Scope Understanding & Development
 - Budget Management
 - Define & Understand Open Book
 - Cost Model & Updates Expectations
 - GMP Expectations (Definition) & Standards
 - Allowances
 - Scheduling & Schedule Management
 - Subcontractor Involvement in Pre-construction Services
 - Project Design Review Expectations
 - Value Engineering/Risk Analysis & Constructability
 - Change Orders During Construction
 - Meetings (Coordination, Utilities, etc.)
 - Public Outreach/Involvement
 - Subcontractor Selection Process
- Project Issues/Concerns

- c. Once the project goes to construction, one item that needs to be added to the traditional partnering agenda is a discussion on the Expectations of the CMAR Process in Construction. The team should discuss if there are differences in the way the project will be managed, problem solving and decision-making related to this delivery method versus a traditional bid project. There have been some challenges with individuals feeling like once others are brought on board, some of the benefits of developing the team during the pre-construction phase is being lost.

Miscellaneous

- 1) Two projects used the Innovation and Opportunities Matrix. Both projects provided input on how beneficial this was as a tool for the team and to aid in showing the benefits of the CMAR process and as a good project reference. The other benefit was for the team to be able to show their achievements as well as promote innovations and discussions to reach the best possible solutions for the project.

Potential Opportunities for Improvement

- a. Continue to use this document for the team during the pre-construction phase and then into construction. It helps to develop consistency in the decision-making process and to accomplish the positive elements as defined above. (See Appendix)
- 2) One of the contractors identified a significant challenge with the overall CMAR process and it is one that is seen across the country. CMAR is frustrating for numerous contractors; as part of the selection process, they are to provide experience in the CMAR process. If they cannot show projects, they will not be selected. How do they ever get the experience? The process begins to be seen as for the “chosen” few.

Potential Opportunities for Improvement

- a. Contractors need to begin to mentor other contractors, include them in their bids and start to let them gain experience to grow the process.
 - b. ADOT may want to eliminate the “CMAR Experience” requirement and replace it with providing input that the contractor shows an understanding of the process and where contractors have performed similar types of services on other work that may not be a CMAR project.
- 3) Benefits of CMAR versus traditional bid – the following items were identified as overall benefits to the project delivery method:
- a. Better problem solving by all partners on the project for the benefit of the project, not individuals. ADOT benefits from all ideas provided by the CMAR versus having to split savings in a VECP approach. A strong focus on optimizing the project approach and value engineering opportunities.
 - b. More effort is provided from the CMAR to meet ADOT’s requirements and preferences compared to a D/B or low bid.
 - c. Streamlines the design process while improving the negative impacts that can occur during construction, reducing change orders.
 - d. Qualification-based helps ADOT to ensure the best value is received.
 - e. It is possible to reduce schedule and impacts to the travelling public as portions of the work can begin without complete plans, such as right-of-way and utility relocation. It affords great opportunities for phasing approaches to reduce impact and complete tasks earlier.
 - f. Have a surveyor from the CMAR be a part of the pre-construction services. It is beneficial as it helps to resolve many issues before they become problems in the field and there is no additional extra charge to ADOT for this work. Many RFI’S that are written are for mainly plan errors that should have been caught during the review process. The surveyor looks at the horizontal and vertical placement of the project, reviews the details shown in the plan set to the placement in the field, will the product fit or meet the governing agency requirement, and is their lacking horizontal or vertical information to build the product.
 - g. Allows the team to better control the schedule and potentially get projects completed more efficiently, saving time and money.
 - h. The delivery method is very effective for complex projects.
 - i. The CMAR can develop the construction phasing and traffic control plans in lieu of spending thousands of dollars on plans that will be changed by the contractor that wins the bid. This aids with communicating with the public. The public hears how the job is going to be built from the beginning, versus ADOT provides their

approach, but when the project is let, the contractor may want to change the phasing to accommodate the way they need to build the project.

- j. A more realistic approach to “can the project be built, given the budget available” versus waiting until the bids are opened. ADOT can better budget their resources.
- k. A strong team approach with a focus on common goals, open communication and resolving issues before they ever become issues.