ENGINEERING POLICY BALLOT

Effective: October 1, 2021

Level 2

Level two revisions require the approval of the **Assistant Chief Engineer** and the **Federal Highway Administration** only. The **Senior Management Team** is encouraged to review the content and provide comment to the appropriate director. For all other parties, these revisions are posted for information only.

ENGINEERING POLICY BALLOT

Effective: October 1, 2021

Issue 1: Design-Build EPG Update

Approval: **Level 2 – Assistant Chief Engineer**

Sponsor: David Simmons - DE

Summary: In EPG 139 and 149, guidance about our processes and procedures in Design-Build is to be updated to conform with both our MoDOT-FHWA Agreement and with recent audits of the Alternate Project Delivery Program. The new Conflict of Interest guidance should be carefully reviewed and considered on all Design-Build Projects. Guidance has been clarified about how projects are reviewed and how they are determined to be good candidates or not for Design-Build. The Project Delivery Determination Tool is also introduced. Guidance about in-depth risk assessment and risk allocation has also been clarified.

Fiscal Impact: There is no anticipated fiscal impact associated with this revision.

Publication: EPG 139 & 149

Issue 2: Pavement Marking – Alternate Passing Lane

Approval: **Level 2 – Assistant Chief Engineer**

Sponsor: Tom Honich – TS
Richard Prosser - DE

Summary: Pavement marking for alternate passing lanes (commonly referred to as shared four-lanes) has never been clearly defined and varies across the state. The implementation of a pavement marking standard for alternate passing lanes will provide consistency for drivers and improve safety.

Fiscal Impact: There is no anticipated fiscal impact associated with this revision.

Publication: Standard Plan 620.00

139.2 Project Selection

* EPG 149 Project Delivery Determination and Risk Assessment provides guidance for design-build project selection.

* Examples of the MHTC back-up documents and transfer of authority are available.

The first steps of any design-build (DB) project are selecting a project and selecting a Project Director. EPG 149 Project Delivery Determination and Initial Risk Assessment provides guidance for the Project Delivery Determination process, which includes goal setting strategies, constraint identification, and risk analysis guidance. Upon selecting a project for DB, a Project Director is named by the district to be confirmed by the appropriate executive management. To obtain approval for both, the District Engineer shall contact the Design-Build Coordinator or State Design Engineer to discuss making arrangements for executive management to consider the project. If design-build is the concurred project delivery method, the MHTC will be consulted to approve the project for design-build and delegate certain approval and expenditure authorities to the Chief Engineer or the Chief Engineer's designee, typically the Project Director.

Once a project has received MHTC approval, basic information about the project should be placed on the Design-Build webpage, by the Project Director contacting the Design-Build Coordinator. The Project Director should also request up-to-date working contract documents, to use as a starting point for their contract.

139.3 The Project Team

The first tool is for the project director to create a small, five to ten member core management team to participate from development of the procurement documents, selection of the design-build contractor and oversight of the performance of the work on the project. The project team should represent a variety of engineering and other disciplines that are important to the project. If possible, the team should be located together and should meet at least weekly to manage the delivery of the project.

139.3.1 Confidentiality Agreements

Each person (MoDOT employee, consultant, or, in some cases, external partners) involved in development of the contract or in project scoring is asked to sign a Confidentiality and Non-Disclosure Agreement. Each person (except FHWA or CCO representatives) involved in the project procurement process should sign a Confidentiality Agreement (Form 139.1.3). Discussions regarding procurement decisions with anyone who has not signed the Confidentiality Agreement are not allowed. In some cases, Consultant Agreements can be used in place of individual Confidentiality and Non-Disclosure Agreements for individuals working for the Consultant. The Project Director is responsible for cataloging

and keeping records of all the individuals who have signed the Confidentiality Agreement. Electronic file keeping is encouraged.

139.3.2 Conflict of Interest

Careful consideration must be contemplated when assembling resources for a Design-Build Project. Resource managers are encouraged to work with MoDOT Chief Council's Office with any issues regarding Conflict of Interest.

Perceived conflicts of interest must be considered when evaluating whether an entity or person is (a) unable or potentially unable to render impartial assistance or advice to MoDOT, (b) is or might be otherwise impaired in its objectivity in performing the contract work, or (c) has an unfair competitive advantage. The following definitions shall be considered to differentiate this type of conflict from those considered "real", "actual", or "potential":

- **Real/Actual Conflict of Interest.** A situation where a person's or entity's official duties can be influenced.
- **Potential Conflict of Interest.** A situation where a person's or entity's official duties may be influenced in the future.
- **Perceived Conflict of Interest.** A situation where a person's or entity's official duties appear to be influenced.

Perceived conflicts of interest will be ***managed by avoidance of the situation***(s) that create the conflicts. A perceived conflict of interest cannot be neutralized.

Certain actions of Design-Build teams, individual entities of Design- Build teams (firms or persons), individual Consultants, Sub-consultants, or Sub-contractors (firms or persons) that may join Design-Build teams, will create perceived conflicts of interest that must be identified and managed by MoDOT staff. These actions include, but are not limited to, the following:

- Meetings, discussions, presentations, seminars, workshops, or any medium where design-build policy modification are directly suggested to MoDOT staff.
- Meetings, discussions, presentations, seminars, workshops, or any medium where design-build policy modification are suggested to MoDOT staff through examples of past practice or lessons learned.
- Meetings, discussions, presentations, seminars, workshops, or any medium where the content is intended to deliver design-build training information.

139.3.2.1 Guidelines for Evaluating Conflict of Interest

MoDOT follows the pertinent state and federal laws regarding Conflict of Interest. Nothing contained in this document is intended to limit, modify, or otherwise alter the applicability or effect of relevant (federal and state) law, rules, and regulations. All such laws, rules, and regulations shall apply in their normal manner irrespective of these guidelines.

MoDOT evaluates the following on a case-by-case basis

1. Whether or not a conflict of interest exists

2. Whether or not the conflict of interest can be avoided or neutralized

3. The appropriate steps to avoid or neutralize conflict of interest in evaluating the above, MoDOT uses the following in making such determinations.

- Section 105.452 RSMo 2000 and Section 105.454 RSMo. 2005 are general conflict of interest statutes applicable to all state officials and employees including MHTC members and MoDOT employees. These statutes prohibit actual conflicts of interest including, but not limited to:
    - favorably acting or refraining from acting on any matter or using decision making authority to obtain financial gain (§105.452(1), (4) and (5) RSMo. 2000);
    - disclosing and/or using confidential information obtained in his/her official capacity in any matter with the intent to result in financial gain (§105.452(2) and (3) RSMo. 2000);
    - performing any service for an agency in which he/she is an officer or employee or has supervisory authority for payment in excess of $500 per transaction or [$1500] $5000 per year without competitive bidding (§105.454(1), (3) RSMo. 2005); and
    - selling or leasing any property to an agency in which he/she is an officer or employee or has supervisory authority over for payment in excess of $500 per transaction or [$1500] $5000 per year without competitive bidding (§105.454(2), (3) RSMo. 2005). However, this provision does not apply to property that is condemned by the agency from its officer or employee (§105.466.3 RSMo. 2005).
- The Federal Highway Administration (FHWA) addresses Conflicts of Interest in relation to federally funded highway projects in general at 23 CFR §1.33, DB projects under 23 CFR §636.116 and §636.117 , and the NEPA process as it relates to DB at 23 CFR §636.109(b) 6 & 7. MoDOT adopts these rules for use on all MoDOT DB contracts, whether federally funded or not.

The following situations are considered to result in Conflict of Interest that cannot be avoided or neutralized. These restrictions apply only to the circumstances described.

1. For DB projects, firms that act as the Owner Engineer, Major Consultant, or key staff employed by the OE or Major Consultant, will not be allowed to join a DB team which submits on a contract that is part of the project for which the person or firm acted in the capacity of a OE, Major Consultant, or key staff employed by the OE or Major Consultant.
2. For DB projects, a Consultant (person or firm) and/or Sub-consultant (person or firm) that assists MoDOT in preparing a RFQ, RFP, ITP, or selection criteria shall not participate in any capacity on a DB team related to the same contract.
3. For DB projects, Consultants and/or Sub-consultants (persons) will not be allowed to do the actual scoring of a Statement of Qualifications (SOQ) or Proposal. Consultants and/or Sub-consultants (persons) may be allowed to act as discipline-specific advisory experts to identify the strengths and weakness of a SOQ or Proposal.

139.3.2.2 Conflict of Interest Form

Each person (MoDOT employee, consultant, or, in some cases, external partners) involved in the evaluation of Statement of Qualifications or the evaluation of Proposals is asked to sign a Conflict of

Interest Form. The person filling out the form shall not leave any section blank. Indication of "N/A" or "None" should be made if there is nothing to report. The Project Director is responsible for reviewing any Conflict of Interest with MoDOT's Design-Build Coordinator and Chief Council's Office. For any indication of a potential COI, documented reasoning and resolution shall be provided on the form by the Project Director, Design-Build Coordinator, or Chief Council representative. The Project Director is responsible for cataloging and keeping records of all the individuals who have signed the Conflict of Interest Forms. Electronic file keeping is encouraged.

139.4.1 Project Goals on Design-Build

Once a project is selected as design-build, the project team should finalize the goals as first drafted during the EPG 149 Project Delivery Determination. The project team should then request approval of the goals by district and central office executive leadership. In order to effectively use project goals to guide the procurement process, the goals must be defined in order of importance. Prioritized goals provide a basis for project "trade-off" decisions during the development of design-build procurement documents and execution of the project contract. Whether the project team is determining short-list criteria, design-build contractor selection criteria, technical provision requirements or risk allocation, the prioritized project goals guide how one approach is selected over other viable options.

Examples of previous Design-Build project goals are available.

Prioritized goals are also useful as a public communication tool throughout the procurement process, as much of the design-build process is confidential in nature. The project goals convey to the public the end result they should see at project completion. Once the goals have been developed and approved, they can be made public, through a project website or other methods. Throughout the project, the goals should be clearly communicated to all project participants including all project personnel, industry public stakeholders. The project team is encouraged to hold a public meeting to communicate the approach of the project and get feedback on the goals.

139.4.2 Content of Project Goal-Setting

Project goals are standards that measure the success of a project. Most projects' goals are complex and therefor require objectives to be established to define how each is to be measured. Objectives are the methods by which the project goals are achieved.

Questions that should be considered when determining the goals for a project include:

1. Is this goal detailed enough to guide preparation of the Procurement Documents?
2. Is this a goal which, if met or exceeded, the public would perceive the project as successful?
3. Is this goal "end-minded"?
4. Is this goal realistic?
5. Is this goal measurable?

6. Is this goal clear?
7. Who is this goal intended to benefit?
8. Is this goal based upon an objective assessment of the needs of the community, MoDOT, etc.?
9. Are the goals established in order of importance?

Questions that should be considered when determining the objectives pertaining to each goal include:

1. Does this objective contribute toward achieving the goal?
2. Will meeting this objective assist in meeting the goal?
3. Is this an objective for the entire project or for a specific area of the project? If it is for a specific area of the project, what are the objectives for the remaining areas that will help achieve the goal?
4. Is this objective time-constrained?
5. Is it an interim or during construction objective?
6. Is this objective achievable?
7. Is this objective measurable?
8. Does the objective provide additional definition in support of the goal?

Once these questions have been addressed and the goals have been developed and approved by MoDOT executive management, the goals can be made public. Throughout the project development process, the goals should be clearly communicated to all project participants including all MoDOT project personnel, the design and construction industry and all project stakeholders.

Examples

The project goals listed below were developed for past projects. The goals are included as a reference for future goal setting efforts.

I-270 North Design-Build Project

1. Deliver the project by December 1, 2023 within the program budget of $225 million.
2. Maximize reliability and safety while linking communities for all users.
3. Provide a durable and maintainable transportation network making Interstate 270 the conduit for a prosperous region.
4. Grow and utilize a diverse workforce.
5. Minimize and mitigate impacts to customers through innovation.

Bootheel Bridge Bundle Design-Build Project

1. Deliver the project within the program budget of $25.2 million on or before December 31, 2023.
2. Use innovation to maximize the number of locations to be addressed while providing quality structures sensitive to location and traffic.

3. Minimize public inconvenience through increased construction speed and flexibility in scheduling.
4. Improve safety at each location.

US 169 Buck O'Neil Bridge Design-Build Project

1. Construct an innovative, low-maintenance Missouri River Bridge that will provide a century of service within the program budget of $247.5 million.
2. Provide a safe, connective and accessible transportation facility that improves regional and local system performance.
3. Manage the impact to the traveling public during construction.
4. Complete the project by December 1, 2024, utilizing a diverse workforce.

Safety Design-Build Project

1. Deliver the project within the budget of $24.11 million.
2. Reduce fatal and serious injury crashes by maximizing safety improvements.
3. Deliver all improvements with a reasonable service life and low maintenance cost.
4. Minimize impacts to the public during and after construction.
5. Complete construction on the project by October 1, 2019.

Route 141 Interchange Design-Build Project

1. Deliver the project within the program budget of $25 million.
2. Maximize mobility on Route 141 and improve efficiency at the I-44 interchange and Vance Road intersection.
3. Deliver the project in a manner which demonstrates the importance of safety.
4. Provide a quality product resulting in a long lasting transportation facility that minimizes future maintenance.
5. Deliver the project using a diverse workforce.
6. Complete project by July 15, 2018.

139.5 In-Depth Risk Assessment and Risk Allocation on Design-Build

The design-build delivery method is unique in that it allows for risks to be assigned or transferred to the most appropriate party.

After developing project goals, the next step to successful design-build delivery is to progress the design and investigation into the project in order to perform an in-depth risk assessment and risk allocation. These exercises are the keys to maximizing the probability of achieving the desired outcome and meeting or exceeding the project goals Appropriate examples of investigation include: Request for Environmental Service findings for Conceptual or Preliminary Plan, Level

B Utility Identification, Right of Way Information, Permitting requirements, understanding of Traffic Safety and Operation of the facility, and any other project related requirements.

Risk assessment for design-build projects involves an analysis of the risks involved on a project that likely would cause a design-build contractor to include cost or schedule contingencies in its proposal. The risk assessment should analyze which risks can be avoided or mitigated, prior to design-build contractor selection. As discussed in EPG 149 Project Delivery Method Determination and Risk Assessment, risks will be evaluated to determine the significance of each risk, the effort required to alleviate or mitigate each risk and the probability of each risk. The project team should use the high level risk assessment developed during the Project Delivery Determination Process as a starting point, examining the project in greater detail.

After the risk assessment has been completed, an evaluation of the party who is in the best position to manage and control all remaining risks (or impacts of remaining risks) further determines the most effective allocation of risks between MoDOT and the design-build contractor to best achieve the project goals. Risk allocation is an allocation between MoDOT and the contractor of responsibility for risks that cannot be avoided. Risk should be allocated to the party best able to manage each risk. The allocations of risks will be set forth in the contract documents.

The desired result of a risk assessment/allocation effort is to use MoDOT resources to avoid or mitigate as much risk as possible prior to Design-Build contractor selection paying close attention to the high impact, high probability risks and to allocate the remaining risks to the party that will be most able to effectively manage the risk.

1. Examples of areas of risks that should be evaluated during a risk allocation include: Environmental – MoDOT may be in the best position to obtain permits from the Army Corps of Engineers, however, the design-build contractor is the best party to obtain new permits or variances to existing environmental permits based upon its design.
2. Right of Way – While in typical situations, MoDOT is the party best able to acquire permanent right of way, the design-build contractor is in the best position to determine the necessary temporary right of way for the project.
3. Utilities – Utilities are generally a shared risk item that need to clearly have location and relocation responsibility known for a Design-Build Contract. MoDOT is able to utilize the existing Master Utility Agreements in place with Utility Company's and supplement with a project specific agreement if necessary.
4. Public Information – While MoDOT may be the best position to identify and communicate daily coping messages to the public, the contractor is the best to notify MoDOT of upcoming work and public impacts.
5. Geotechnical – Once MoDOT has determined the extent of an adequate geotechnical investigation, it is normally the Design-Build contractor who should assume the risk of deviations from the borings.
6. Method of Handling Traffic – Are there agreements that MoDOT can enter into with local jurisdictions for alternate routes?

7. Drainage – Careful consideration should be taken to decide if existing hydraulic information should be provided to enhance the quality of proposals submitted. Who is best able to perform studies of off-site flows, hydrology, etc?
8. Insurance – What type of insurance would be advantageous for each project - traditional insurance, OCIP, CCIP, PCIP?
9. Lighting Agreements – MoDOT may be able to reduce the Design-Build contractor's contingency by reaching an agreement with the power company utility owner related to temporary lighting.
10. Maintenance During Construction Example - While the risk of maintenance during construction may be most appropriately allocated to the design-build contractor, the risk of extraordinary maintenance of the project during construction may be best allocated to MoDOT.
11.
12. Noise Walls – While MoDOT is probably the best party to assume the risk of dealing with the public regarding many noise wall issues during the environmental process, the Design-Build contractor is the best party to determine where the noise walls are required based upon its final design.

9.

10.

11.

139.8.1.6 Short List Approval

According to 7 CSR 10-24.030, all responses to the Request for Qualifications will be evaluated by a prequalification review/short listing team, known as the Executive Selection Committee. The Executive Selection Committee will be comprised of the following MoDOT staff or their designated representative: Chief Engineer, Chief Financial and Administrative Officer (Chief Financial Officer), Controller (Financial Services Director), Director of Program Delivery (Assistant Chief Engineer), one or more District Engineer(s), Project Director for Project, State Construction and Materials Engineer, State Bridge Engineer and the State Design Engineer. Federal Highway Administration (FHWA), acting as an external partner will be an observer to the prequalification/short listing process.

After scoring in accordance with the SOQ Evaluation Procedures document, the Project Director will meet with the Executive Selection Committee to present details of all SOQs received, as well as the ratings each team received. The Executive Selection Committee report should documentation shall include, at a minimum:

- Confidentiality forms (Form 139.1.3)
- Conflict of Interest forms (Form 139.8.1.5)
- Copy of presentation
- Final Recommendation Report
- Scoring sheets or a summary of scoring sheets
- Submitter organization charts
- Project RFQ
- Project SOQ Scoring Procedures
- Blank Short-list Recommendation Approval for Chief Engineer's signature

- Minutes from the Executive Selection Committee Meeting including members present and action taken.
- ~~Copy of the Missouri Design-Build Statute and MoDOT Design-Build Rules~~

A representative from the Chief Counsel's Office should attend this meeting to advise staff on any legal matters. Following the presentation, the Executive Selection Committee will move to approve the short list.

Once the short list is approved, all submitting teams should be notified whether or not they were short-listed. Once the teams have been notified, the short list is announced publicly, through a press release and/or posting on the project website. After the short list is announced, the project team may elect to offer debrief meetings with all submitting teams, including those that were not short-listed to provide feedback on their SOQs.

Category:149 Project Delivery ~~Method~~ Determination and Initial Risk Assessment

149.1 Project Delivery ~~Method~~ Determination

MoDOT uses innovative contracting to ensure that the public receives full value for every tax dollar invested in Missouri's transportation system. Innovative contracting methods provide the ability to accelerate project delivery, reduce cost, improve quality and minimize impacts to the traveling public. A discussion of MoDOT's various innovative contracting methods can be found in EPG 147 Innovative Contracting.

Project Delivery Determination Flow Chart

In order to select an appropriate project delivery method ~~or innovative contracting tool~~, a project must be evaluated to determine how the project aligns with each available delivery method~~/innovative contracting tool~~. This evaluation is accomplished as shown in the Project Delivery Method Determination Flow Chart. ~~, by setting project goals, assessing project risks and examining the appropriateness of the available delivery methods given the specifics of the project.~~ A Project Delivery Determination (PDD) tool has been established to guide Project Teams through the evaluation to determine appropriate delivery methods. This PDD is considered a national best practice to weigh project characteristics against key factors for consideration. Although all projects benefit from this review, it is especially important that large (Projects over $50M) and/or complex projects be considered in order that the most appropriate delivery method is used. Example Project Types that should be considered include but are not limited to: Bundled Projects, Major River Bridges, Complex corridor projects, and complex interchange projects.

The Project Delivery Determination Document provides a formal approach for selecting project delivery methods for highway projects. By using the PDD Tool, a Project Delivery Selection Report can be generated for each individual project. The primary objectives of this tool are:

- Present a structured approach to assist MoDOT in making project delivery decisions;

- Assist MoDOT in determining if there is a dominant or optimal choice of a delivery method; and
- Provide documentation of the selection decision.

149.1.1 Background

The project delivery method is the process by which a construction project is comprehensively designed and constructed including project scope definition, organization of designers, constructors and various consultants, sequencing of design and construction operations, execution of design and construction, and closeout and start-up. Thus, the different project delivery methods are distinguished by the manner in which contracts between the agency, designers, and builders are formed and the technical relationships that evolve between each party inside those contracts. Currently, there are several types of project delivery systems available for publicly funded transportation projects. MoDOT generally uses two primary delivery methods: Design-Bid-Build (DBB) and Design-Build (DB). Design-Bid-Build can include other alternative contracting methods such as: A+B Bidding, Fixed Price Variable Scope (FPVS), Indefinite Delivery Indefinite Quantity (IDIQ) and Alternate Technical Concepts (ATC). No single project delivery method is appropriate for every project. Each project must be examined individually to determine how it aligns with the attributes of each available delivery method.

149.1.2 Primary Delivery Methods

Design-Bid-Build is the traditional project delivery method in which an agency designs, or retains a designer to furnish complete design services, and then advertises and awards a separate construction contract based on the designer's completed construction documents. In DBB, the agency "owns" the details of design during construction and as a result, is responsible for the cost of any errors, omissions, and unknowns encountered in construction.

Design-Build is a project delivery method in which the agency procures both design and construction services in the same contract from a single, legal entity referred to as the design-builder. This method uses Request for Qualifications (RFQ)/Request for Proposals (RFP) procedures rather than the DBB Invitation for Bids procedures. The design-builder controls the details of design and is responsible for the cost of any errors or omissions encountered in construction.

149.1.3 Facilitation of the Tool

When embarking on using the project delivery determination tool for the first time, it is recommended that a facilitator is brought in for the workshop. The facilitator will assist with working through the tool and provide guidance for discussing the project and selection of a delivery method. This individual should be knowledgeable about the process and should be consistently used. The facilitator also helps to answer questions and make sure the process stays on track and the team moves towards a formal selection.

Participation

Using the project delivery determination matrix is only as good as the people who are involved in the selection workshop. Therefore, it is necessary to have a collection of individuals to participate in the selection of the delivery method. The selection team may include members of district and division leadership, the Area Team, applicable discipline leads from both district and division levels, and staff from previous Design-Build teams. When crafting the invite list, it is important to include both a variety of personnel and keep the numbers low to promote a collaborative discussion.

Potential bias

The best approach for the participants of the Project Delivery Determination Workshop is to keep an open mind about the delivery method to choose. Failure to maintain an objective approach by everyone in the workshop will result in an inaccurate outcome.

149.1.4 Project Delivery Selection Process

The process is shown in the outline below and a flowchart on the next page. It consists of individual steps to complete the entire process. The steps should be followed in sequential order.

Step 1: Project Overview and Status
Step 2: Establish Draft Project Goals
Step 3: Document Project Constraints
Step 3: High Level Risk Analysis
- A. Brainstorm Major Risk Areas
- B. Analyze and compile risk factors

Step 4: Primary Factor Evaluation
- A. Assess the primary factors (these factors most often determine the selection)
    1. Complexity and Innovation
    2. Delivery Schedule
    3. Project Cost Considerations
    4. Level of Design
    5. Project Risks (High-Medium)

Step 5: Secondary Factor Evaluation (if ness.)
- A. Perform a pass/fail analysis of the secondary factors to ensure that they are not relevant to the decision.
    6. Staff Experience/Availability (Agency)
    7. Level of Oversight and Control
    8. Competition and Contractor Experience

B. If pass/fail analysis does not result in clear determination of the method of delivery, then perform a more rigorous evaluation of the secondary factors against all potential methods of delivery

149.2 Draft Project Goals

An understanding of project goals is essential to selecting an appropriate project delivery method. Therefore, draft project goals should be set prior to using the project delivery selection matrix. Typically, the project goals can be defined in three to five items and need to be reviewed here. Example goals are provided below, but the report should include project-specific goals. These goals should remain consistent over the life of the project.

Schedule

- Minimize project delivery time
- Complete the project on schedule
- Accelerate start of project revenue

Cost

- Minimize project cost
- Maximize project budget
- Complete the project on budget
- Maximize the project scope and improvements within the project budget

Quality

- Meet or exceed project requirements
- Select the best team
- Provide a high quality design and construction constraints
- Provide an aesthetically pleasing project

Functional

- Maximize the life cycle performance of the project

- Maximize capacity and mobility improvements
- Minimize inconvenience to the traveling public during construction
- Maximize safety of workers and traveling public during construction

149.3 Purpose and Objective of Project Goal-Setting

The determined project goals for a particular project will be the basis by which the project delivery method will be determined and the project specific procurement requirements will be developed. These goals allow decision-makers to evaluate the advantages and challenges of various procurement methods and to select a project delivery method that provides the best opportunity for success.

In order to effectively use project goals to guide the project delivery method selection, the goals must be prioritized in order of importance to MoDOT. The determined "priority order" allows project delivery decisions-makers to use the most important goal as the “pivot point” to analyze all delivery choices. The remaining goals, listed in descending order of importance, further define and shape the project’s procurement/delivery strategies.

149.4 Project Delivery Constraints

There are potential aspects of a project that can eliminate the need to evaluate one or more of the possible delivery methods. A list of general constraints can be found below and should be referred to while completing the Project Delivery Determination.

149.4.1 Project Specific Constraints

Schedule

- Utilize federal funding by a certain date
- Complete the project on schedule
- Weather and/or environmental impact

Cost

- Project must not exceed a specific amount

- Minimal changes will be accepted
- Some funding may be utilized for specific type of work (bridges, drainage, etc)

Quality

- Must adhere to standards proposed by the Agency
- High quality design and construction constraints
- Adhere to local and federal codes

Functional

- Traveling public must not be disrupted during construction
- Hazardous site where safety is a concern

149.5 Initial Risk Assessment

Risk is an uncertain event or condition that, if it occurs, has an effect on a project's objectives. Risk allocation is the assignment of unknown events or conditions to the party that can best manage them. An initial assessment of project risks is important to ensure the selection of the delivery method that can properly address them. An approach that focuses on a fair allocation of risk will be most successful.

Performing an initial project risk assessment is necessary to determine and document the most appropriate delivery method for a project. A thorough risk assessment allows MoDOT to clearly identify, prioritize and assign resources to risk avoidance and mitigation opportunities in order to help eliminate or reduce risk to the project. The resultant risks and an understanding of the efforts required to properly manage the risk, provide the necessary perspective by which the appropriate project delivery method should be selected.

For each project risk assessment, the assessment team is composed of MoDOT staff from all applicable functional units. Typically, this team consists of traditional core team members, with each member having different areas of expertise, such as design, construction, right of way, utilities, geotechnical, traffic and maintenance. Depending on the project, you may include staff from other expertise areas including environmental and customer relations. Each of the core

disciplines applicable to the project should be included in the risk assessment meeting. It may also be helpful to include a facilitator to organize, streamline and expedite the process.

149.5.1 Content of Initial Risk Assessment

The first step of a risk assessment is to brainstorm project risks. A brainstorming spreadsheet can be used to capture all project risks. Examples of areas of risks that should be evaluated during a risk assessment include:

Risk Assessment Brainstorm Sheet

1. Environmental: Are there environmental permits that MoDOT can obtain? How can the NEPA document allow for flexibility in the ultimate project solution? Noise Walls: Can MoDOT agree with the public to a height, elevation, etc. of a noise wall or to a process to reach agreement on a noise wall?
2. Right of way: Are there parcels that acquisition can be avoided? Can the amount of right of way acquired be minimized?
3. Utilities: What utilities are possible conflicts? Are there utilities with long relocation schedules? Should a SUE be pursued?
4. Public Information: Are there research efforts that can assist in formulating a public information plan or method of handling traffic plan? Are there key audiences that could derail the project?
5. Third Party Agreements and Permits (other than environmental): Are there local IGA's, railroad agreements, process agreements, standards agreements that need to be obtained?
6. Drainage: Are there third party approvals necessary for drainage design?
7. Method of Handling Traffic: Can MoDOT agree to detour routes with a public entity?
8. Roadway design: Are there variances or exceptions that will be required? Is an AJR required?
9. Structures: Are there approvals or variances that need to obtained?

149.5.2 Initial Risk Assessment Process

A Risk Assessment Worksheet should be used to document the risk and the resultant mitigation efforts, if any, that will be performed. Traditionally the steps in the risk assessment process are as follows:

Risk Assessment Worksheet

A broad area of risk is identified and listed on the form as a "Risk Category".

For each risk category, all associated specific risk elements are identified and listed on the risk worksheet under the heading "Risk Element". If a project has several risks, multiple risk worksheets can be filled out for each risk category.

The risk assessment team evaluates each risk elements “impact factor”. The impact factor is the significance of the impact that each risk element could have to the goals of the project, rated on a 0 to 6 scale (6 being the greatest impact – 0 being no impact), The impact factor is recorded in column A.

Next, the risk assessment team evaluates the magnitude or “level of the effort factor” required to avoid or mitigate each specific risk element. This level of effort factor is rated on a 0 to 6 scale (6 being the greatest effort – 0 being no effort and is recorded in column B.

Next, for each risk element the risk assessment team determines the probability of the risk impact occurring if no action to avoid or mitigate the risk is taken. The probability factor rated on a 0 to 1.0 scale is recorded in column C.

As a result of the ratings, a Risk Factor is calculated (Column A * Column B * Column C) for each risk element. The greater the Risk Factor, the higher the priority for MoDOT to identify the appropriate mitigation efforts necessary to reduce the risk and the greater the level of resources that must be employed to mitigate that risk.

The final step in the risk assessment process is to identify the risk mitigation tasks that need to occur to reduce the risks to the project goals.

149.5.3 Assigning Risk Elements to Delivery Method

Following evaluation of all of the Risks, the team should identify the medium and high risk items from the evaluation. The team should then assign these risk items to the delivery method that provides the best advantage to mitigate given the information known about them at that time. If no clear advantage is evident, document those risk items accordingly.

149.6 Project Delivery Determination

In order to determine the best delivery method for a project, it is helpful to consider the advantages and disadvantages (i.e. the pros and cons) of each delivery method. This may include a review of likely risk allocations which would occur if the design-build delivery method were pursued, as discussed in EPG 139 Design - Build. After reviewing the project goals, the project specific risks and the advantages and disadvantages of each delivery method, the ~~project core~~ evaluation team recommends a delivery method to their district management.

Some advantages of design-build are:

Allows innovation on projects with multiple solutions

Allows significant opportunity for innovation

Permits extreme cost control

Designs tailored to a contractor's strengths

Establishes single point of responsibility between MoDOT and contractor

Coordinates design & construction expertise

Allocates risks to best party

Bases contract on performance requirements & specifications

Saves time

Some advantages of traditional design-bid-build are:

Maintains MoDOT's control of design process and solutions

Designer works directly for MoDOT

Works well for projects with tight constraints that may limit innovation (i.e. floodplain, schedule, environmental issues ROW)

Allows for "on-the-shelf" plans being developed in advance, i.e. an upfront construction funding allocation is not required

Applies best for use on routine projects, such as overlays

Some advantages of traditional design-bid-build with Alternate Technical Concepts (ATCs) are:

Allows implementation at any stage

Allows opportunity for contractor innovation, but MoDOT maintains control of ultimate design solution

Tailors designs to a contractor's strengths to achieve the most economical design

Entices smaller contractors, increasing competition

Uses plans that have been developed to an advanced stage

Maximizes competitive bidding

149.7 Documentation and Approval

Documentation of the project delivery method determination must include the following:

Project background

Project specific details

Project Goals

Project Constraints

High Risk Elements

Delivery Method Comparison (Pros/Cons)

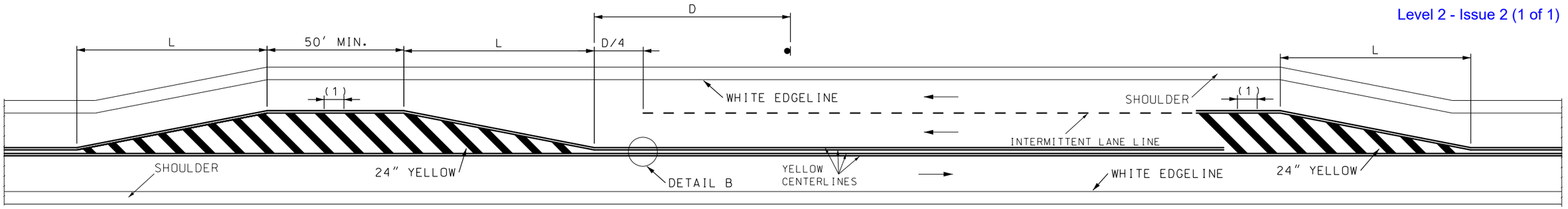
Obstacles and Opportunities for each Delivery Method

Summary & Recommendation

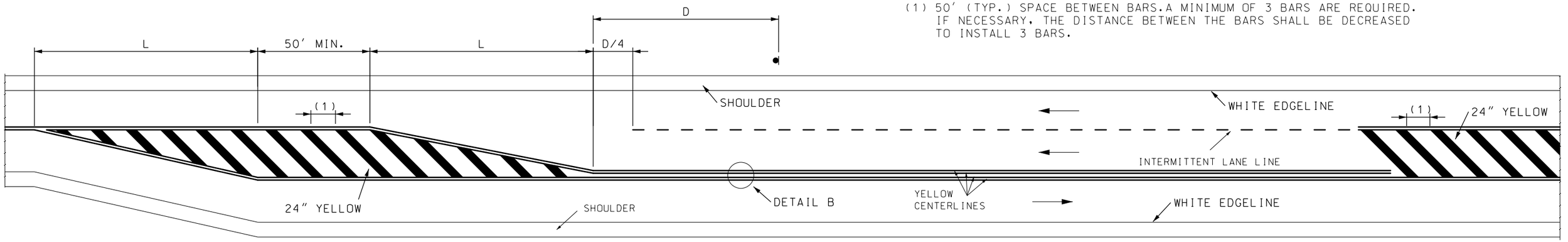
Attachments/Exhibits

If design-build is the recommended delivery method, the District Engineer or his designee should present the project to the Chief Engineer and Assistant Chief Engineer for approval to move forward. Approval is required to ensure MoDOT is using design-build on the most appropriate projects and to ensure that MoDOT does not exceed its legislative authority of 2% of the number of projects per year.

If DBB with ATCs is the recommended delivery method, the project team should contact the Bidding and Contract Services and their Design Liaison for further guidance.



(1) 50' (TYP.) SPACE BETWEEN BARS. A MINIMUM OF 3 BARS ARE REQUIRED. IF NECESSARY, THE DISTANCE BETWEEN THE BARS SHALL BE DECREASED TO INSTALL 3 BARS.



L = S x W WHEN POSTED SPEED 45 MPH OR GREATER OR $WS^2/60$ WHEN POSTED SPEED IS 40 MPH OR LESS. EXTEND DISTANCE (L) AS REQUIRED BY SIGHT DISTANCE CONDITIONS.

L = LENGTH OF TAPER IN FEET.

S = POSTED OR 85 PERCENTILE SPEED IN MPH.

W = OFFSET DISTANCE IN FEET.

D = WARNING SIGN SPACING MEASURED FROM BEGINNING OF THE TAPER TO WARNING SIGN "LANE ENDS MERGE RIGHT"

GENERAL NOTES:

INTERMITTENT LINES SHALL BE 10 FEET IN LENGTH SEPARATED BY 30 FOOT GAPS.

RIGHT SIDE EDGELINES SHALL BE SOLID WHITE. EDGELINES SHALL BE CONTINUOUS ACROSS DRIVEWAYS AND MINOR INTERSECTING ROADS.

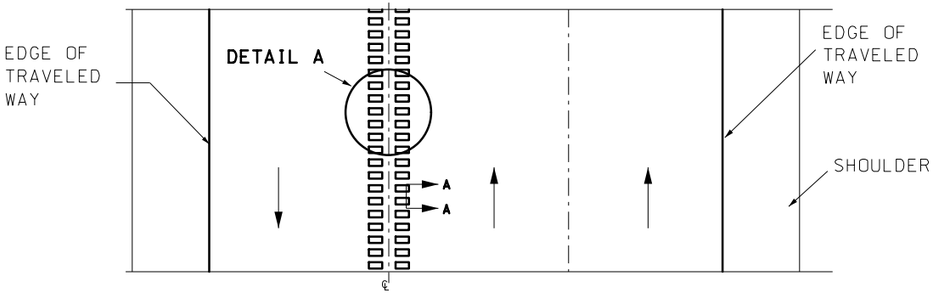
CENTERLINE RUMBLE STRIPS ON PASSING ROADWAYS SHALL FOLLOW PAVEMENT STRIPING THROUGH TRANSITIONS. SEE CONTRACT PLANS FOR STRIPING DETAILS.

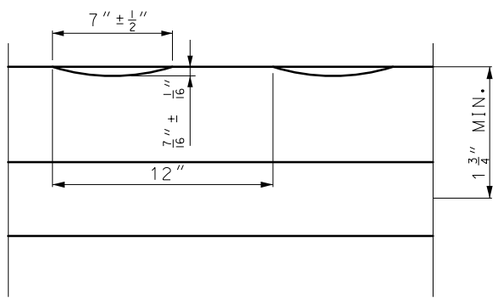
RUMBLE STRIPS SHALL NOT BE PLACED ON BRIDGES.

ALL RUMBLE STRIPS SHALL BE MILLED.

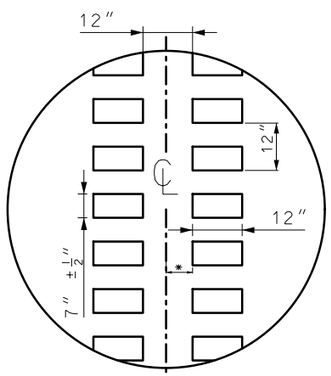
CENTERLINE RUMBLE STRIPS SHALL BE CONTINUOUS THROUGH CONNECTIONS OF SIDEROADS WITH NO LEFT TURN LANES.

DISCONTINUE CENTERLINE RUMBLE STRIPS THROUGH THE LIMITS OF ALL LEFT TURN LANES. INCLUDING ANY LANE TAPER SECTIONS.



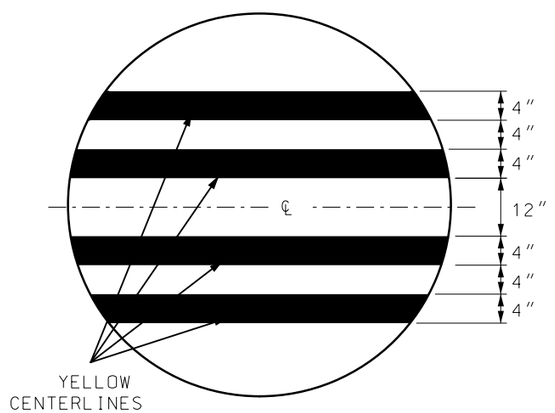


SECTION A-A



DETAIL A

* = LATERAL DEVIATION SHALL NOT EXCEED ONE INCH IN 100 FEET.



DETAIL B

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

PAVEMENT MARKING

ALTERNATE PASSING LANE

NEW SHEET

DATE EFFECTIVE: 10/01/2021
DATE PREPARED: 5/27/2021

620.00M

SHEET NO. 2 OF 6