

Utilizing Fixed Price Variable Scope Contracting for Design-Bid-Build Construction Projects (SEP-14) FY 2022 Program Update

Purpose and Scope

The Missouri Department of Transportation (MoDOT) and the Federal Highway Administration (FHWA) have entered into this programmatic work plan agreement to approve the use of Fixed Price Variable Scope Contracting (FPVS) on preventive maintenance and traffic control device installation types of work when deemed appropriate and beneficial in accordance with the guidelines set forth in [EPG Article 147.4](#). With this agreement, MoDOT and FHWA agree to programmatically approve the use of FPVS, a form of “alternative contracting” identified under the FHWA’s SEP-14 program, without requiring a specific work plan and approval for each individual project.

Introduction

FPVS is a competitive Alternative Contracting Method (ACM) that allows an agency to maximize the amount of work completed for a fixed budget amount. The benefit of this contract method allows MoDOT to vary the amount of work to be completed to match the budget programmed for the project. MoDOT has successfully used FPVS contracting on numerous projects over the last couple of years. An advantage to contractors will be the ability to calculate bids knowing the locations of work, based on priorities established in the bid proposal.

This contract method allows MoDOT to vary the amount of work to be completed to match the budget programmed for the projects. The work included in the bid proposal is established in priority order to be completed and will exceed the amount of work that is expected to be completed by the budget in order to capitalize on getting better than expected bids. This procurement method will have the contractor bid a unit price for the estimated bid quantities for each item of work in the contract. The estimated quantities included in the contract represent the amount of work than can be completed for the budgeted amount. Once the project has been awarded, the MoDOT construction office would then manage the contract by adjusting the contract quantities to deliver the budgeted amount.

One of the goals of using FPVS is to reduce the amount of work required by staff to manage MoDOT’s program. A project with a constrained budget reduces the burden on staff to reallocate funds from projects if the cost estimate is exceeded or reduced. By using a fixed amount of funds, MoDOT did not have to search for additional projects to allocate any bid savings to, or conversely find additional funds from un-let projects. This also results in not having to prepare additional proposals and bid letting packages. The FPVS process saves the Department staff time and effort.

Federal Fiscal Year 2022 Reporting

Missouri Report: In FY 2022, eight (8) Projects were delivered using Fixed Price Variable Scope. FPVS projects in Missouri receive bids through the traditional bidding process. The Contractor provides unit prices for the pay items provided in the schedule of items. The selected contractor is determined by the lowest submitted bid. The project is awarded at the lowest bid price. The bid book is made up of the

normal pay items and quantities estimated by the Engineer that are included in the bid quantities. MoDOT provides the Contractors with the available budget for the project in the Job Special Provisions. The portion of the project that is not included in the bid book is considered the variable scope and is shown in the plans and Job Special Provisions in priority order after the bid quantities for removal or addition based on the bid price. Both the bid quantities and the variable scope quantities are included in the design and the environmental clearance document.

Project Development Considerations

MoDOT's FPVS projects were all environmentally classified as categorical exclusions. Each project needs to be cleared through the environmental process and all permits obtained for the entire project limits and not just what is estimated to be constructed. Work cannot exceed what is environmentally cleared.

The projects and scope were approved in the State Transportation Improvement Plan (STIP) The portions of the project that were not constructed will be included in future projects.

Bid Process and Results

MoDOT receives bids electronically on all DBB projects. Appendix A contains the bidding results for each FPVS awarded in 2022, and includes the scope of work, number of bidders, the bids from all bidders, the engineer's estimate of work and the additional work gained beyond the engineer's estimate.

Although the 2022 projects were programmed with approximately 20-30% more work than the engineer's estimate of work, maximum bids were received on one (1) of the eight (8) FPVS projects.

The engineer's estimate of work on FPVS projects is based on historical average unit prices from a geographic area. The 2022 letting results from the FPVS projects indicate that the FPVS contracting method on FPVS with pavement markings is cost effective, and that more work is being performed to preserve MoDOT's roads than through the use of conventional Design-Bid-Build contracts.

Performance Measures and Reporting

Tracker Measure 3f – Innovative Contracting Methods and Value Engineering is MoDOT's performance measure that captures use of Design-Build, Fixed Price Variable Scope, A+B Contracting, and Design-Bid-Build ATC at MoDOT. The target is 10% of MoDOT's total program be used on innovative contracting. MoDOT's Tracker can be found at <https://www.modot.org/innovative-contracting-and-value-engineering-3f>. Measure 3f is located in the Deliver Transportation Solutions of Great Value section.

MoDOT is expanding the use of FPVS into other preventative maintenance spaces. MoDOT has delivered the first MMA bridge crack-filling, surface leveling, hot polymer concrete patching, and HMA crack filling project work types in addition to an existing yearly seal coat project. MoDOT is realizing promising successes on targeted preventative maintenance projects as a way to manage our assets through using this ACM. In fiscal year 2022, MoDOT awarded 8 FPVS projects. MoDOT used innovative contracting to deliver 12 (8 FPVS, 3 DB, 1 DBB ATC) of 312 projects in FY 22 accounting for approximately 28% of the \$1.3 Billion Program. The 2 projects per year and 10% of program value targets were achieved.

Cost and Time Savings

With preventative maintenance as the target for using FPVS, there is a substantial savings in both cost and time by delaying major improvements to assets and efficiently putting programmed resources to use. Additionally, by bundling many routes into one contract with a guaranteed price, MoDOT has realized lower bids on many of the projects compared other projects in the same area delivered traditionally. Using this method also provides the ability to get under contract efficiently and mitigate market fluctuations in real time.

Lessons Learned and Industry Reaction (To Date):

- MoDOT has met with representatives from Industry to discuss the innovative contracting methods being used on projects and required mandatory pre-bid meetings for each new type of FPVS project. Since then, MoDOT has used FPVS on many different projects, most prevalently on seal coat treatment. Some projects that have become standard practice are evaluated independently to determine if a pre-bid meeting is required or not.
- After the pre-bid meeting for the first MMA bridge crack filling project J6P3646, industry provided feedback that it is problematic for their bidding to have a bridge over a railroad included near the bid scope/variable scope line. Future projects in this series of FPVS will have all bridges over railroads be either the first bridges in the bid quantities or the last in the variable scope in order to give more certainty to the contractor about bidding railroad costs.
- During construction of a seal coat project J6P3605, there were issues determining the project limits termination. The route had large amounts of high friction surface treatment placed on it previously and the contractor had to spend a lot of resources determining how much aggregate to order to correct for the HFST on the route. The lesson learned is if a route like this is to be done that includes HFST, MoDOT should ensure the whole route gets completed and terminate the limits more strategically. A debrief was done with the contractor after the project was completed to walk through the issue. The contractor did mention that they would continue to bid on this yearly project in the future.
- An attempt to deliver a cape seal project in FY22 on J6MAMD02. MoDOT found there are other complexities to the project that make it not the best delivery method for FPVS because of the requirement to trigger other improvements within the project limits such as guardrail improvements and ADA upgrades. These modifications are required to be addressed as part of the project and complicate the use of FPVS on these types of jobs.
- This delivery method is useful to have a yearly project for each type in a planned sequence to maximize the scope done with the fixed-price and prepare resources to complete the projects more strategically.
- MoDOT realized on Job JSL0001 which is a crack sealing job on various routes, bundling many routes into one contract provide bid prices significantly reduced as seen in many “buy in bulk” approaches that provide economies of scale. Managing one contract also provides efficiencies in construction inspection. This project ran out of scope for the budget and future projects in the series are correcting for the efficiency.
- Hot polymer repairs in concrete pavements in traditional projects have traditionally proven problematic with having enough money for the scope needed to complete full routes. This delivery method has provided MoDOT a great tool to use to remove the risk of incomplete routes and make logical project termini for work in the following year.

Appendix A

FY 2022 Bid Results:

Job Number	Letting	Scope of Work	Funding	Budget	Engineer's Estimate	Number of Bidders	Contractor	Bid	Scope Change
J6P3605	21-Jan-22	Seal Coat	Federally	\$554,000	\$583,113.45	4	Missouri Petroleum	\$764,916.53	27.57%
							N.B. West Contracting	\$835,583.85	
							Blevins Asphalt	\$872,220.76	
							Emery Sapp & Sons	\$909,369.05	
J6S3606	21-Jan-22	Seal Coat	State-Only	\$182,000	189,130.36	4	Missouri Petroleum	\$230,237.48	20.95%
							N.B. West Contracting	\$244,415.21	
							Blevins Asphalt	\$261,624.24	
							Emery Sapp & Sons	\$302,843.05	
J6S3657	10-Oct-21	Hot Polymer	Federally	\$1,500,000	\$1,487,102.62	3	Emery Sapp & Sons	\$1,365,499.66	-9.85%
							Parking Lot Maintenance	\$1,390,960.95	
							Interstate Improvement	\$2,439,656.65	
J6P3646	21-Jan-22	MMA	Federally	\$500,000	\$507,782.52	2	Louis-Company	\$478,115	-4.58%
							R.V. Wagner	\$498,975.20	
JSL0001	15-Apr-22	HMA Crack Filling	Federally	\$1,346,000	\$1,428,500	3	Parking Lot Maintenance	\$574,938.26	-148.46%
							Sweetens Concrete Services	\$604,168.48	
							Fahrner Asphalt Sealers	\$797,759.54	
J3MAMD01 J4MAMD01	18-Jun-21	Contractor Leveling Course	State-Only	\$1,678,000	\$1,678,000	3	Magruder Paving	\$1,799,291.19	6.74%
							Emery Sapp & Sons	\$2,082,705.05	
							Capital Paving & Constructor	\$2,128,460.69	
J6MAMD02	18-Jun-21	Cape Sealing	State-Only	\$1,071,000	\$1,148,785.41	2	Microsurfacing Contractors	\$1,014,413.59	-5.58%
							Missouri Petroleum	\$1,055,030.54	