

**Special Experimental Project No. 14 (SEP-14)
Programmatic Use of Type 1, Type 2 & Type 3 Fixed Price Variable Scope Contracting on Capital Preventative Maintenance Projects
Calendar Year 2015 Annual Evaluation Report
June 1, 2016**

Introduction

The Michigan Department of Transportation (MDOT) received programmatic approval to utilize Fixed Price Variable Scope (FPVS) contracting on Capital Preventative Maintenance (CPM) Projects. The purpose of FPVS contracting is to construct the greatest amount of work with the available project budget and gain more value for the dollar by using this innovative contracting method.

This annual report covers Type 1, Type 2 and Type 3 FPVS CPM projects let in fiscal year 2015.

Type 1, 2 & 3 FPVS Contracting Overview

MDOT has developed three types of FPVS procurements requiring approval through this SEP-14 Work Plan. This Work Plan only applies to CPM projects using Type 1, 2 & 3 procurements. Non-CPM projects using a Type 1, 2 or 3 procurements require a separate approval unless otherwise directed by the FHWA.

Type 1: Type 1 FPVS projects receive bids by a unit of work that can be completed for a stated fixed price. The selected contractor is the bidder that proposes the most units of work for the given fixed price. For example, a HMA crack sealing project would be bid by the lane miles a contractor can complete based on the fixed price provided in the contract. In the event of a tie, bidders will be required to submit a revised price for the amount of work originally bid, and the bidder with the lowest price would be the selected contractor.

Type 2: Type 2 FPVS projects receive bids by a unit of work that can be completed for a maximum fixed price. Contractors also bid a price for the work that is below the maximum price. The work that will be completed is identified at the time of the bid. The selected contractor is first determined by the bidder that proposes the most units of work for the price they bid. If two or more contractors propose the same amount of work, then the successful bidder is determined by which contractor proposed the lowest maximum price. For example, the single Type 2 project MDOT has let received bids based on the square yards of epoxy overlay that can be completed and a price to complete the work included in the bid. The square yards bid had to place an epoxy overlay over an entire bridge deck (a partial bridge deck was not acceptable), and the price bid had to be below the maximum price. In the event of a tie, bidders will be required to submit a revised price for the amount of work originally bid, and the bidder with the lowest price would be the selected contractor.

Type 3: Type 3 FPVS projects receive bids through traditional bidding processes where MDOT advertises the project through traditional methods and the contractor provides unit prices for the pay items provided in the schedule of items. The selected contractor would be the one that submits the low bid based on the pay items and quantities in the Schedule of items. The project is awarded to the low bidder at the low bid price.

The schedule of items is made up of the normal pay items and quantities estimated by the Engineer that are required to complete "Priority 1". On federally funded projects the Priority 1 work should not be reduced so it is typically setup to be approximately 90% of the budgeted amount. MDOT may provide the Contractors with the available budget for the project. The portion of the project that is not included in the Schedule of Items is considered "Priority 2" (additional priority areas may also be identified in the plans). Priorities beyond Priority 1 are included in the design

and the environmental clearance document, and the contract contains informational pay items and quantities for these priorities. The work in Priority 1 will be completed by the project. If bids are favorable, or if additional funding becomes available to the project during construction, the project work is extended into Priority 2 until the final construction costs are approximately equal to the available funding.

Project Development Considerations

MDOT's CPM 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 were approved in the State Transportation Improvement Plan (STIP) as part of the General Program Account (GPA) for capital preventative maintenance projects. The portions of the project that were not constructed will be included in future projects.

FPVS contracting can modify how projects are bid, inspected, constructed and paid. Contract documents are included, when necessary, to provide clear bidding instruction, and to modify MDOT's typical process on design-bid-build (DBB) projects. This is done to conform to the intent of the FPVS contracting method while meeting state and federal requirements. FHWA Michigan staff reviewed and approved new contract language when the original FPVS program began.

The Project Manager on each FPVS project determines when a bid would be considered for rejection. On traditional DBB projects, this occurs when the low bid is greater than 10% of engineer's price estimate. On Type 1 and Type 2 FPVS projects, rejection of a bid would be considered if the bid would perform 10% less work than the engineer estimated. Type 3 FPVS projects would use the standard process to determine bid rejection.

Bid Process and Results

MDOT receives bids electronically on all DBB projects. However, MDOT's bid letting system cannot accommodate the bidding process of Type 1 and Type 2 FPVS projects, and a hand delivered paper bid is required. Type 3 projects are bid in a traditional fashion, using our current letting system. Appendix A contains the bidding results for each type of FPVS, and includes the scope of work, lane mile cost, number of bidders, the bids from all bidders, and the engineer's estimate of work.

In 2015, MDOT did not let any Type 2 CPM FPVS projects that would apply to this programmatic report. MDOT did let fifteen Type 1 projects and one Type 3 project. The Type 1 projects resulted in completing 56.29 miles more than the engineer's estimate, which is an average increase of 4.39%. Fourteen of the projects were HMA crack sealing, and one project was a concrete joint resealing project. Four of the projects did not receive the minimum amount of lane miles required therefore all bids were rejected. The contract documents were revised and re-advertised in a future letting.

The bids on the M-99 project came in 14.2% under the engineers estimate allowing MDOT to resurface more roadway than what would have occurred in 2015.

The engineer's estimate of work on FPVS projects is based on historical average unit prices from a geographic area. The 2015 letting results from the CPM FPVS projects indicate that the FPVS contracting

method is cost effective, and that more work is being performed to preserve MDOT's roads than through the use of conventional Design-Bid-Build contracts.

Industry Coordination and Reaction

When MDOT began using FPVS in 2012, MDOT met with representatives from Industry to discuss the innovative contracting methods being used on a project, and required mandatory pre-bid meetings. MDOT has used FPVS on many different projects, most prevalently on crack sealing projects, and no longer has pre-bid meetings on these projects. Other projects are evaluated independently to determine if a pre-bid meeting is required.

The Michigan Road Preservation Association (MRPA) represents contractors that perform preservation work including HMA crack sealing and chip seals. MRPA has indicated that its members are supportive of the use of FPVS, and feels this method keeps funding in their niche industry that is typically moved from their industry's work if there are bid savings on projects. The Innovative Contracting area participates in the quarterly meetings when requested.

Administrative Consideration

One of the goals of using FPVS is to reduce the amount of work required by staff to manage MDOT'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, MDOT 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.

Additional Comments and Recommendations

Based on MDOT's experience in 2015, MDOT has the following recommendations:

1. The maximum limits of the work should exceed the estimated amount of work. Bidding history should be reviewed for the type of work being contracted to estimate the normal variations in bids on DBB projects. This is done to estimate the minimum amount of work that should be included in the project beyond the estimated amount of work. The bid history should be examined for projects of similar geographic areas (ie: urban or rural settings, similar traffic control setups, etc). MDOT has also compiled historical lane mile costs per Region to assist the Project Managers.
2. Coordination with all stakeholders, including internal MDOT staff, industry, and federal highways is important and should be done early in the programs development. MDOT personnel that are critical to coordinate with are from the environmental, planning, contracting, design, construction and technical subject matter experts.
3. For HMA crack treatment and overband projects, the Engineer should evaluate the pavement condition and the severity of cracking. If cracking is more prevalent on some routes, the Engineer should take this into account when preparing their estimate of work. After discussion with industry, this was a major contributing factor for the projects that were re-let due to the bidders not completing the minimum amount of work.

Contract Information

Specific FPVS contracts can be found by looking up each project on MDOT's e-Proposal website (<http://mdotcf.state.mi.us/public/eprop/login/index.cfm>). Once registered, enter the e-Proposal website by

typing in the user's email address and password. Instructions for registering new users are on the left side of this page. Select the letting date from the "Lettings" area on the left side of the page, and then select the item number from the pull down menu. The project proposal and any addenda will be available for downloading from this location.

MDOT has also developed a guide of the development of FPVS projects. This guide was incorporated as an appendix to MDOT's Innovative Construction Contracting Guide in early 2015 and is publicly posted on MDOT's website.

Unique contract items or traditional contract items modified by MDOT on the 2015 Type 1 FPVS projects are listed below.

- Schedule of Items*
- Special Provision for Hot Mix Asphalt Crack Treatment on Fixed Price Variable Scope Projects**
- Special Provision for Warranty Work requirements for Hot Mix Asphalt Crack Treatment, Special on Fixed Price Variable Scope Projects **
- Special Provision for Capital Preventative Maintenance Work on Fixed Price Variable Scope Projects **
- Special Provision for the Preparation of Bid and Delivery of Bid ***

* The Schedule of Items is modified to reflect FPVS contracting and how the project is bid.

** Special Provisions are modified to reflect changes needed for FPVS contracting.

*** The Special Provision for the Preparation of Bid and Delivery of Bid provides instruction on how to submit a paper bid on a project.

Items unique to Type 3 FPVS contracts are listed below

- Notice to Bidder for Fixed Price-Variable Scope Contracting: This Notice to Bidders indicates how the contract will be managed to a pre-established budget.
- Special Provision for Significant Changes in the Character of Work on Fixed Price-Variable Scope Projects: This special provision modifies the Standard Specifications so increases or decreases in quantities do not constitute a change to the contract.
- Special Provision for Extension of Time on Calendar Date Fixed Price-Variable Scope Projects: This special provision would extend the completion date of the project if extended beyond Priority 1. This special provision is an optional document on Type 3 FPVS projects.

Appendix A: 2015 Bid Letting Results

Federally Funded CPM FPVS Projects

JOB #	Delivery - Procurement Method	Region	Route	Location	Work Description	Letting & Call #	# of Bidders	Max Bid	Winning Bid	Engineer's Estimate of Work	Bid Price Per Lane Mile	Gain/Loss (Ln Mile)	Gain/Loss (%)	Other Bids
124048	FPVS - Type 1	Bay	Various	TSC Wide - Arenac, Clare, Gladwin, Gratiot, Midland, Saginaw	HMA Crack Treatment	150114 #601	3	174.24	131.88	117.94	\$2,808.39	13.94	11.82%	127.00, 119.54
124066	FPVS - Type 1	Bay	Various	TSC Wide - Genesee, Huron, Sanilac, Shiawassee	HMA Crack Treatment	150211 #601	3	64.90	53.00	48.20	\$3,113.21	4.80	9.96%	48.2, 48.2
113535*	FPVS - Type 1	Grand	US-31BR	at US-31 Lot # 561002	Crack Seal existing Carpool Lot	150311 #605	2	153.90	66.25	76.95	\$3,924.53	(10.70)	-13.91%	49.25
122638*	FPVS - Type 1	Grand	Various	TSC Wide - Muskegon, Oceana Co	HMA Crack Treatment		-	-	-	-	-	-	-	-
122622	FPVS - Type 1	Grand	Various	TSC Wide - Kent, Mecosta, Montcalm Co	HMA Crack Treatment	150113 #602	3	239.75	129.49	129.35	\$3,861.30	0.14	0.11%	129.35, 129.35
123213**	FPVS - Type 1	Grand	Various	TSC Wide - Kent County	Road and Bridge Concrete Jnt Seal	150506 #602	2	108.86	64.03	57.48	\$24,847.73	6.55	11.40%	57.19
123241**	FPVS - Type 1	Grand	Various	TSC Wide - Kent County	Bridge Joint Sealing		-	-	-	-	-	-	-	-
123996	FPVS - Type 1	Metro	Various	TSC Wide - Oakland County	HMA Crack Treatment	141008 #601	3	381.99	294.67	321.00	\$2,606.64	(26.33)	-8.20	155.76, 143.56
123995	FPVS - Type 1	Metro	Various	Regionwide	HMA Crack Treatment	150408 #602	1	160.33	146.73	122.00	\$4,089.14	24.73	20.27%	N/A
125549	FPVS - Type 1	Metro	Various	TSC Wide - Wayne County	HMA Crack Treatment	150506 #601	1	216.60	170.20	190.00	\$4,700.35	(19.80)	-10.42%	N/A
125548	FPVS - Type 1	Metro	Various	TSC Wide - Wayne County	HMA Crack Treatment	150610 #602	1	177.95	161.45	161.05	\$3,716.32	0.40	0.25%	N/A
126898	FPVS - Type 1	Superior	Various	TSC Wide - Alger, Chippewa, Luce, Mackinac, Schoolcraft	HMA Crack Treatment	150506 #603	2	430.07	294.93	276.93	\$2,168.31	18.00	6.50%	276.93
126899	FPVS - Type 1	Superior	Various	TSC Wide-Baraga, Houghton, Keweenaw, Marquette, Ontonogon	HMA Crack Treatment	150610 #604	2	279.43	142.01	154.00	\$2,986.06	(11.99)	-7.79%	122.63
124111	FPVS - Type 1	Superior	Various	TSC Wide-Gogebic, Iron, Dickinson, Menominee, Delta	HMA Crack Treatment	150610 #603	2	366.93	228.37	203.04	\$2,732.63	25.33	12.48%	209.44
124084	FPVS - Type 1	University	Various	TSC Wide - Ingham, Clinton, Eaton, Shiawassee Co	HMA Crack Treatment	150311 #603	2	168.55	111.37	89.04	\$2,993.03	22.33	25.08%	98.04
124068	FPVS - Type 1	University	Various	TSC Wide - Hillsdale, Ingham, Jackson, Lenawee Co	HMA Crack Treatment	150506 #605	2	126.46	113.82	95.00	\$3,284.41	18.82	19.81%	98.13
124039	FPVS - Type 1	University	Various	TSC Wide - Livingston, Washtenaw, Monroe Co	HMA Crack Treatment	150610 #601	1	191.51	76.07	86.00	\$4,601.03	(9.93)	-11.55%	N/A
123966	FPVS - Type 3	University	M-99	S Eaton Rapids City Limits south to Jackson Co Ln	1.5" HMA Overlay w/ shoulder gravel	150311 #601	2	-	\$ 596,227.81	\$ 694,929.68	-	-	-14.20%	\$608,749.59

Note: Items with asterisks (*, **) were packaged and let together