

**PROCUREMENT OF
MICHIGAN AGGREGATES MARKET STUDY**

Investigation Report

Jack Cotter, CPA, CGMA

Commission Auditor

PROCUREMENT OF MICHIGAN AGGREGATES MARKET STUDY
INVESTIGATION REPORT

TABLE OF CONTENTS

Background.....	2
Objective, Scope, and Methodology	3
Conclusion	3
MDOT Contracting Activities – Summary	4
Structure of the Remainder of This Report.....	5
Organization Chart of Pertinent MDOT Agencies and Personnel	6
MDOT Contracting Activities for Phases I and II	7
Summary of Findings.....	20
Glossary	21



STATE OF MICHIGAN
STATE TRANSPORTATION COMMISSION
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September 26, 2019

State Transportation Commission
P.O. Box 30050
Lansing, MI 48909

Members of the State Transportation Commission,

At the request of the Michigan State Transportation Commission, this is a report on our investigation of MDOT's efforts to procure the *Michigan Aggregates Market Study* (Phases I and II).

This report contains a background; objective, scope, and methodology; summary of MDOT's contracting activities; our assessment of MDOT's compliance with requirements; summary of findings; and glossary.

Sincerely,

Jack Cotter, CPA, CGMA
Commission Auditor
Michigan Department of Transportation
Office of Commission Audits

• Todd A. Wyett, Chair • Michael D. Hayes, Vice Chair • George K. Heartwell • Charles F. Moser • Chris J. Yatooma • Helen Zeerip •

BACKGROUND

The Michigan Department of Transportation (MDOT^{*}) stated that it commissioned the *Michigan Aggregates Market Study (Study^{*})* to determine whether current resources for aggregates will be sufficient to meet the needs of the MDOT highway construction program for the next 30 to 50 years. The report was intended to inform the 21st Century Infrastructure Commission in time for its October 2016 proceedings.

MDOT commissioned the *Study* in two phases. According to the MDOT Scope of Services (Scope^{*}), Phase I "...is intended to identify the major aggregate sources in the State, the volume of aggregate produced, and estimate the overall 'permitted' inventory of quality aggregate reserves within the state of Michigan and whether these reserves may be sufficient, in a general sense, to meet future demands of Michigan's Federal Aid highway construction program," while Phase II "...is intended to determine possible engineering and economic impacts to MDOT's transportation program budget."

MDOT selected FMI Corporation, Inc. (FMI^{*}) to perform Phase I of the *Study*. MDOT released the final Phase I report in November 2016. The report was too late to be used by the 21st Century Infrastructure Commission proceedings.

MDOT selected Public Sector Consultants, Inc. (PSC^{*}) to perform Phase II of the *Study*. Although the due date for the Phase II report was March 30, 2019, as of September 26, 2019, PSC has not provided the report to MDOT.

* See Glossary.

OBJECTIVE, SCOPE, AND METHODOLOGY

Objective

The objective of our investigation was to determine whether MDOT adhered to applicable requirements in its procurement of the *Study* (Phases I and II).

Scope

Our investigation covered MDOT's efforts to procure the *Study* (Phases I and II) and to discuss related topics.

Our investigation does not constitute an audit conducted in accordance with generally accepted government auditing standards and therefore, does not provide assurance regarding our observations and recommendations that would otherwise be achievable under an audit. We performed this investigation to provide information for consideration and use by MDOT and the Michigan State Transportation Commission (Commission^{*}).

Methodology

Our efforts included the following:

1. We gained an understanding of the applicable and related requirements.
2. We reviewed communications by persons involved in the *Study*.
3. We interviewed MDOT employees and vendors.
4. We assessed MDOT's compliance with its applicable contracting requirements.

CONCLUSION

MDOT did not adhere to applicable requirements in its procurement of the *Study*.

As a result, MDOT contracted for and accepted consultant services and a resultant report that risks being insufficiently comprehensive, unverifiable, partially irrelevant and, consequently, unreliable. Also, MDOT did not ensure that it received fair value for costs it incurred.

* See Glossary.

MDOT CONTRACTING ACTIVITIES – SUMMARY

Activities to procure consultant services are generally interrelated and are often dependent on steps taken and decisions made in prior activities. As such our observations, later in the document, might not necessarily be linear because of our desire to present a sufficiently comprehensive narrative. That is, it is possible that some narrative might, depending on the perspective of the reader, seemingly fit more closely in a different section.

Our understanding of MDOT's pre-award and post-award contracting activities is as follows:

Pre-Award

When contracting for services, MDOT project managers (PM*) are initially required to:

1. Determine the needs of the department
2. Define a scope necessary to meet those needs, inclusive of determining whether engineering is required
3. Independently estimate the cost required to meet those needs
4. Based on the independent estimate, advertise the project using the applicable MDOT cost-tier and selection methodology
 - a. Vendor selection methods are determined by the type of work being performed.
 - i. Engineering services require qualifications-only selection, using subjective factors (qualifications-based selection, or QBS*)
 - ii. Other services (non-engineering) are required to use price as a factor in selection (either Low-Bid, which only considers price, or Best-Value, which uses a combination of subjective and objective factors)
5. Receive and review vendor proposals
6. Select a service vendor based on the proposals
7. If price is not a factor in selection (i.e., QBS), negotiate a price with the most-qualified vendor using the PM's independent estimate (item 3, above) as a baseline for negotiation
8. Upon conclusion of a mutually acceptable negotiation, award the contract

Post-Award

After awarding the contract, one can reasonably expect that MDOT PMs should do the following to ensure that taxpayers receive proper value:

1. Monitor the vendor's progress and compliance with contract provisions
2. Determine whether the vendor's deliverables are acceptable

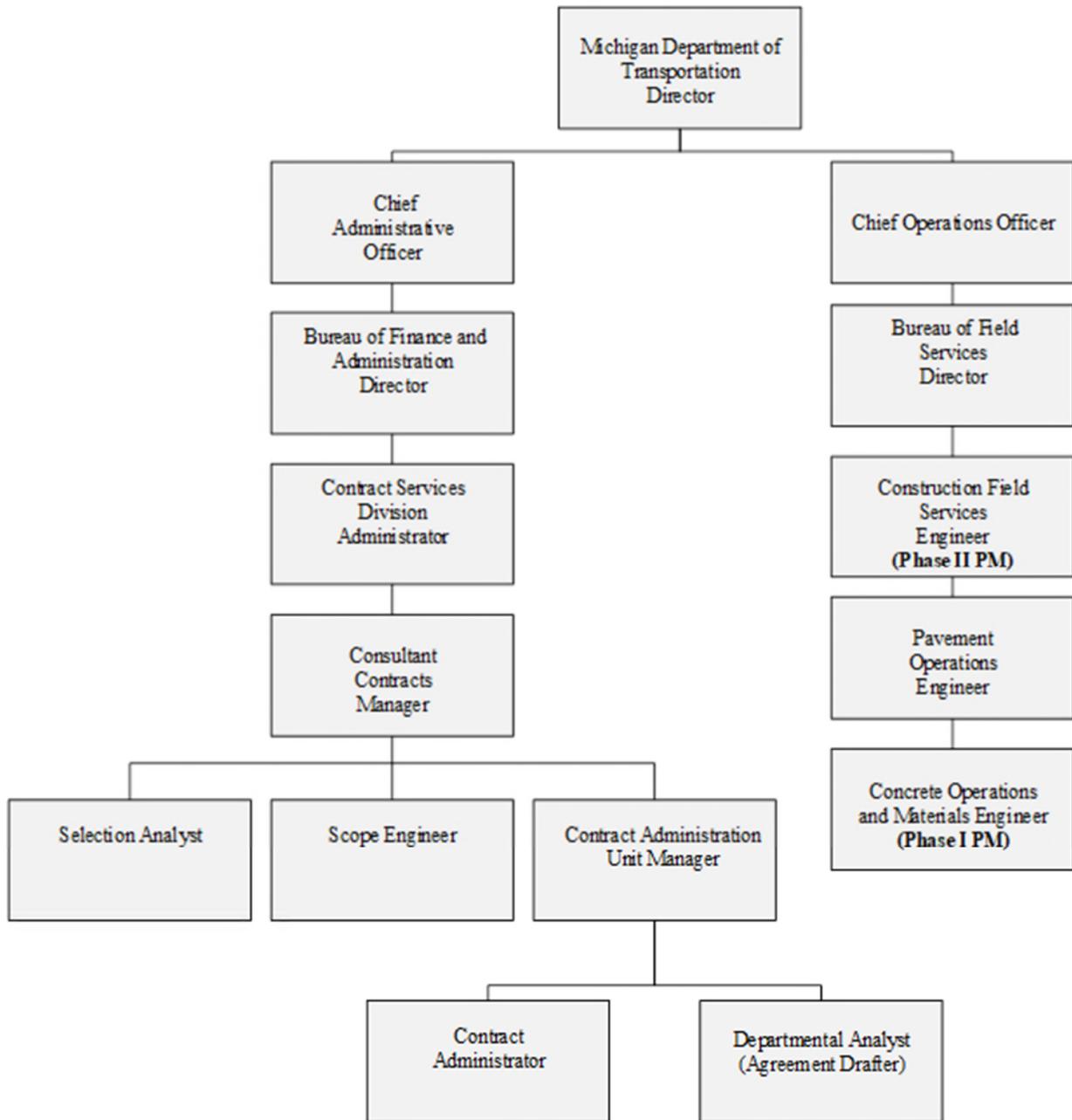
* See Glossary.

STRUCTURE OF THE REMAINDER OF THIS REPORT

We will present information we obtained and analyzed during the investigation in terms of each of the MDOT Contracting Activities shown in the previous section of this report. Where applicable, findings will broadly encapsulate, in relevant discussion that follows, observed noncompliance or opportunities for improvement.

The organization chart on the next page presents pertinent agencies and personnel titles later mentioned in this report.

ORGANIZATION CHART OF PERTINENT MDOT AGENCIES AND PERSONNEL



MDOT CONTRACTING ACTIVITIES FOR PHASES I AND II

We compared MDOT's actual activities with the required and expected contracting activities and assessed MDOT's compliance with related requirements.

Pre-Award Step 1: Determine the needs of the department

Entities, like the government or private sector companies, occasionally work with stakeholders and external subject matter experts as the entity considers, defines, and formulates its needs and desires. Along those lines, the President of the Michigan Aggregates Association (MAA^{*}) proposed to the former MDOT Director an aggregate market study to address whether there are enough permitted aggregates to meet long-term demand and would help Michigan's stakeholders develop a long-term aggregate supply strategy. The former Director of MDOT subsequently requested that MDOT staff put out a request for proposal (RFP^{*}) for the *Study*. And, based on that request, the MDOT PM proceeded to obtain Phase I of the *Study*.

Also, according to the Phase I Scope, the outcome of Phase I would influence the direction and need for a Phase II. MDOT asserted to us that it determined the need for Phase II of the *Study* after receiving the results of Phase I.

Although working with stakeholders can be an acceptable method of helping an entity to identify needs, we have concerns with the level of influence that MDOT allowed MAA to exert over MDOT as MDOT's needs were articulated for the *Study*. Those concerns continue as this report discusses Pre-Award Step 2, Defining a scope to meet MDOT's needs.

Pre-Award Step 2: Define a scope necessary to meet those needs, inclusive of determining whether engineering is required

Finding 1: MDOT was not able to provide to us documentation that it objectively developed an appropriate need-based scope.

An objectively-developed need-based scope could help ensure that MDOT expends its resources on a worthwhile project (e.g., timely, complete, relevant, accurate, and useful).

In an email to the former MDOT Director, MAA proposed an outline for the scope of a study that would eventually become Phase I and Phase II of the *Study*. Also, according to an email from the MDOT Engineer of CFS, MAA recommended that the *Study* be broken into two parts and described what services should take place in each part.

Regarding whether the project would be worthwhile, we noted:

1. Responsible, knowledgeable MDOT personnel indicated that they believe Phase I, as scoped, was a) not useful on its own without Phase II and b) not appropriately comprehensive to provide meaningful information. The MDOT personnel further stated

* See Glossary.

that they were willing to essentially accept the weaknesses of the Phase I Scope in order to get to Phase II, which they felt might be pertinent to the objective of the *Study*.

The PMs asserted, and the Scope regarding Phase I of the *Study* stated, that Phase II was optional. However, MDOT did not set criteria as to Phase I results that would justify a Phase II. Logically, as *all* aggregate resources are limited in the context of existing mines, Phase I would, as a certainty, identify an eventual local shortfall. MDOT did not create an expectation of what shortfall would justify a further study, compelling us to infer that Phase II was, in fact, always planned.

2. The Phase I PM asserted that quality and utility of the report was a lesser priority than meeting the deadline. In related emails, both MAA and MDOT were aware, if the *Study* were to cost more than \$50,000, that the procurement would be subject to a longer pre-contracting timeline. Procurements exceeding \$50,000 affect the number of review and oversight steps and number and level of staff needed to perform duties related to the procurement. Both the Phase I and Phase II PMs stated that the project needed be kept under \$50,000 because of the desired time frame.

Regarding whether the Scope of Phase I met MDOT's needs, when the Phase I PM eventually drafted the Scope, the PM sent the draft to MAA, and asked the MAA President to "...take a look at the attached draft and see whether or not I [the MDOT PM] perverted your [President of MAA] intent?" It seems that MDOT's needs were not the primary focus of the Phase I Scope.

Regarding MDOT's determination within the Scope that engineering services were required, and thus allowed a subjective selection process (rather than cost-based or value-based), MDOT personnel eventually and, in our view, inappropriately justified use of QBS (see Pre-Award Step 4). They asserted that the MDOT PM would provide engineering oversight for the Phase I *Study*, which would allow MDOT to classify the project as an engineering contract. In our view, the engineering oversight language (form) did not make the nature of the work "engineering" (substance), as defined by MDOT procedures and the federal law on which those procedures are based. Specifically, the federal Brooks Act defines engineering services as "professional services of an architectural or engineering nature... that are required to be performed or approved by a person licensed, registered, or certified to provide the services," "professional services of an architectural or engineering nature that are associated with research, planning, development, design, construction, alteration, or repair of real property," or "other professional services of an architectural or engineering nature... which members of the architectural and engineering professions may logically or justifiably perform."

We inquired into the likely inappropriate use of QBS with the MDOT Contract Services Division (CSD^{*}) personnel responsible for reviewing and approving selection types. Those personnel informed us that they do not evaluate or question MDOT project managers' decisions regarding whether "engineering" is involved in a contract. However, upon further inquiry, we identified evidence to the contrary; CSD supervisory personnel later asserted to us that evaluation and questioning of MDOT PM's selection types is a routine task. Therefore, CSD personnel should

* See Glossary.

have questioned and rejected the PM's use of QBS, but instead, CSD approved the selection (see **Finding 5**).

Regarding Phase II, MAA also drafted the Scope. In an email from the President of MAA to the MDOT Field Services Bureau Director, the MAA President stated, "To assist with the development of a scope for phase II, I have drafted the attached scope as a starting point."

The Engineer of Construction Field Services (CFS*) originally chose the Phase I PM to be the Phase II PM. In the Phase II PM's efforts to draft a Scope, the PM drafted a research problem statement for Phase II and provided it to MDOT's Research Program Manager. However, the Engineer of CFS stated in an email to the Phase II PM that the research proposal was "...not what they [MAA] had in mind." Thereafter, the Engineer of CFS rejected the research proposal and took over as the Phase II PM.

As with the Phase I Scope, the Scope for Phase II listed "engineering expertise" as a preferred qualification. MDOT used what we consider to be imprecise phrasing in the Scope, which allowed MDOT to justify a QBS selection (i.e., subjective rather than objective). The economic portion of the *Study* does not conform to the definition of an engineering service as described by law (specifically the Brooks Act, as described earlier in this Step). As the prime contractor was not an engineering firm, and that the primary focus of the work was not related to engineering, MDOT should have used a value-based selection process. In fact, MDOT did not contract with engineering firms to perform either Phase I or Phase II of the *Study*. Phase I and Phase II each likely fit into the category of an MDOT research project, where a professional researcher (often, a university) would, if needed, employ or consult with aggregate experts or engineers as a part of the required work; however, we believe that the scope of market or economic studies or analysis is different than what could reasonably be considered an engineering service.

In summary, we cannot be certain that the Scopes, as written, represent MDOT's needs, or the taxpayers' need for a worthwhile project, and we conclude that the Scopes were inappropriately developed, which allowed MDOT to use subjective selection processes rather than a value/cost driven selection processes (see **Pre-Award Step 4, Finding 4**).

Pre-Award Step 3: Independently estimate the cost required to meet those needs

***Finding 2:** MDOT did not adhere to its guidelines regarding the preparation of independent cost estimates.*

Part 1.3 of MDOT's Selection Guidelines states, "MDOT Project Managers are responsible for providing independent cost estimates as related to the selection to determine the appropriate RFP Tier. These cost estimates must be completed prior to advertisement."

An independent cost estimate includes:

1. Developing an expectation of the required effort for the project in terms of person-hours and other direct costs (travel, etc.)
2. Applying relevant labor and overhead rates to the person hours

3. Allowing a reasonable profit margin (MDOT policy is 11% of labor and overhead)

However, MDOT's Phase I PM did not prepare an independent cost estimate. Rather, we observed, in an email from the PM to the President of MAA, that the PM asked the MAA President to provide the estimate of hours and costs. During our interview with Phase I PM, the PM asserted that he asked the MAA President to price the project because the MAA President would have a better idea of how many hours the project would require. In considering the PM's assertion, we make four observations:

1. We concluded from our discussion with the Phase I PM that the PM did not have sufficient knowledge or experience regarding research projects or cost-estimating to evaluate the MAA president's estimate (e.g. how many hours and at what cost).
2. MAA's president's assumptions on hourly rates were not consistent with typical rates for research professionals as described to us by MDOT personnel typically responsible for contracting research projects.
3. At the time of the estimate, both MAA and MDOT were aware that the project would need to be under \$50,000 in order to qualify for expedited procurement.
4. MAA's estimate came in just under \$50,000, and numerous emails to and from MDOT employees reiterate that point.

Contrary to the intent of the requirement that PMs provide independent cost estimates, MDOT assigned to the project, and did not manage, a PM who, by the PM's own admission, did not have sufficient experience or ability to provide the required estimate.

In our discussions with other MDOT employees having knowledge of aggregate supply, and conversations with and information from those proposers/vendors not selected as part of Phase I or Phase II, we obtained a sufficient basis to conclude that, to effectively (properly) perform the *Study*, the scope of which comprised permitted mines spanning all of Michigan, the cost would significantly exceed the contract amount of \$50,000.

Regarding Phase I, our research, inclusive of interviews with subject-matter experts within MDOT, indicates that proper efforts, upon which a report user could place reliance, would require activities such as geological surveys and other related activities. MDOT's aggregate experts and outside parties explained to us that more-extensive surveys are performed in other states that wish to adequately identify aggregate reserves and holistically plan aggregate extraction in consideration of factors such as urban expansion and the effects of mining on communities. The limitation of \$50,000 did not align with the need for information that MDOT sought.

Regarding Phase II, the PM prepared a cost estimate. However, the PM's estimate:

- 1) Was based on engineering firm costs, rather than the costs of a researcher.
- 2) The PM's estimated hours (200 total hours) were significantly lower than the originally-selected consultant's proposed hours (309 total hours, or 54% greater than the PM's estimate), possibly reflecting an unreliable estimate by the PM when considered with the MDOT PM's eventual acceptance of the originally-selected consultant's 309 hour proposal.

- 3) The PM's estimate omitted profit in arriving at a figure under \$50,000; when accounting for profit, the estimate exceeded the artificially determined \$50,000 maximum. Only by the omission of profit was a No Tier selection justified (defined in Pre-Award Step 4).

In summary, we conclude that the Phase I estimate was a fraction of the cost of a study that would meet the State's need for information about aggregate supplies that would allow the State to make informed decisions. For Phase II, it is unclear whether the PM's estimate or the consultant's proposed costs were reasonable, considering the Scope of the project and the significant difference between the PM's hours estimate and the eventually-accepted proposed hours (which drive total costs).

Pre-Award Step 4: Based on the estimate, advertise the project using the appropriate MDOT cost tier and selection methodology

Finding 3: MDOT did not adhere to its guidelines regarding RFP Tiers.

MDOT's Selection Guidelines categorize RFPs into four tiers: No Tier, Tier I, Tier II, and Tier III. Each tier has its own selection procedures and requirements, which are continuously more extensive, based on the estimated costs of the project (higher selection standards, and more/ higher-level MDOT employees). Selection Guidelines effective during the selection process stated that No Tier RFPs are for service costs under \$50,000.

Part 2.1 of the Selection Guidelines states, "Services selected by this [the No Tier] process cannot be amended to exceed \$50,000. Services that exceed \$50,000 cannot be broken down into smaller components merely to permit the use of this selection process. If it is anticipated that the cost of the service could eventually exceed \$50,000, the Tier I, II, or III process must be followed."

As noted earlier in this report, in our interviews with both the Phase I PM and the Engineer of MDOT's Construction Field Services Division (the Phase II successor PM), MDOT chose to keep the project under \$50,000 so that MDOT could complete the selection and contracting process in a timely manner and meet the deadline set by the former MDOT Director. According to the Phase I Scope document, "...Phase I will influence the direction of Phase II." Therefore, even during Phase I, we are compelled to believe that MDOT intended there to be two phases to the aggregate study project. We conclude that MDOT did not comply with Part 2.1 and, instead, MDOT should have followed the Tier I, II, or III selection process for Phase I.

The Phase I PM was seemingly aware of the existence of the requirement that the project should not have been split into two scopes; in an email from the Phase I PM to the MAA President, the PM stated that he could not "... give the impression that we are attempting to circumvent the 50K max contract by splitting it up into two 50K scopes."

In summary, as we have previously presented, MDOT complied, in form, with the No Tier requirements, as the scopes of Phase I and II were each under \$50,000. However, MDOT inappropriately split the *Study* into two phases that were each under \$50,000 and used the No Tier selection process for both phases. In substance, MDOT did not comply with Part 2.1 of the Selection Guidelines.

Finding 4: MDOT did not adhere to its guidelines regarding selection methodology.

Generally, in a properly-functioning market-based economy, objective selection processes, such as bidding for goods and services and best value selection, allow purchasers to obtain the optimal value for their money. To that end, MDOT bids out virtually all construction activities through a letting process. Best value procurements entail MDOT's evaluation of both price and the of quality of a proposal. MDOT frequently uses best value procurements for non-engineering services other than construction. For non-construction acquisitions, however, such as procurements related to the acquisition of engineering services using federal funds (generally design engineering, construction site engineering, etc.), the federal government requires (Brooks Act) states to base their initial selections of engineering consultants on the quality of the firm (i.e., QBS discussed earlier). Quality is a subjective determination that varies among raters' perspectives. Under the Brooks Act, the procurement of architecture or engineering services cannot use price (low bids and best-value) as a selection factor.

Because of the value that can be derived to the procurer from bidding or best-value selection, Part 2.4 of MDOT's Selection Guidelines states, "The selection of non-Brooks Act services must utilize either a Low Bid or Best Value Selection," (where price is a factor in the selection criteria).

As previously mentioned, engineering services according to the Brooks Act are "professional services of an architectural or engineering nature...that are required to be performed or approved by a person licensed, registered, or certified to provide the services," "professional services of an architectural or engineering nature that are associated with research, planning, development, design, construction, alteration, or repair of real property," or "other professional services of an architectural or engineering nature... which members of the architectural and engineering professions may logically or justifiably perform."

As stated previously, the services that FMI and PSC respectively performed for Phases I and II of the *Study* primarily related to market research and economics. In our view, and initially in the view of CSD, the services did not meet the definition of architectural and engineering services contained in the Brooks Act. Consistent with our view, for each phase of the *Study*, MDOT selected a non-engineering firm to perform the services. However, contrary to the requirements for non-engineering firms, MDOT selected the vendors for both phases using QBS, (which, did not include price as a factor and, instead, used subjective factors) and we conclude that MDOT did not comply with Part 2.4 of MDOT's Selection Guidelines, which require MDOT to use price as a factor.

Finding 5: MDOT does not have effective controls in place to detect and prevent instances of noncompliance with its Selection Guidelines.

One should reasonably expect that MDOT has developed and implemented a control point to prevent improper selection methodologies from occurring. For example, CSD, whose functions include many aspects and processes related to vendor selection, contracting, and invoice processing and payment, would be a likely candidate for such a control point. However, during our interviews with CSD, we received conflicting answers regarding CSD's efforts to ensure MDOT compliance with selection requirements.

In email communications between the Phase I MDOT PM and various individuals from CSD, both the Consultant Contracts Manager and the Selections Analyst communicated to the PM that, because the work was not engineering, price must be a factor in the selection criteria. Subsequent to these communications, the PM added to the Scope: “The engineering oversight as it relates to the physical/mechanical properties of the aggregates versus the highway application will be determined by the MDOT project manager (PM).” Thereafter, the MDOT Selection Analyst approved use of the QBS methodology.

Specifically, in our conversation with the CSD Administrator about the language changes to the Scope and the use of QBS for Phase I, the CSD Administrator stated that CSD’s role is to process the paperwork for the contract and is not responsible to help ensure MDOT compliance with selection requirements. However, in our interviews with other CSD personnel, evaluation and questioning of MDOT project manager’s selection types was stated to be a routine task.

In summary, CSD rejected, then accepted, MDOT’s selection method after MDOT added “engineering oversight,” to the Scope. In our view, the new language was not sufficient to warrant the substance of using QBS selection. Because the vendor was not performing the engineering services, we believe that MDOT should have selected its vendor using price as a factor (e.g., Low Bid or Best Value selection).

Pre-Award Step 5: Receive and review vendor proposals

Finding: None

“No Tier” selections require MDOT to solicit at least three vendors. For Phase I, MAA recommended FMI and PSC to MDOT. Consequently, the MDOT PM requested proposals from FMI and PSC and a Michigan university research center that specializes in the subject area. PSC did not submit a proposal.

For Phase II, the MDOT PM requested proposals from FMI, PSC, and an engineering firm. The engineering firm did not submit a proposal.

For purposes of this report, MDOT’s review of the proposals are not reasonably separable from its selection of the vendor, covered in the next step.

Pre-Award Step 6: Select a service vendor

***Finding 6:** MDOT selected FMI for both Phases, although FMI’s proposal for Phase I was not sufficiently detailed to support the selection criteria or MDOT’s conclusions regarding FMI’s qualifications. FMI’s proposal for Phase II did not meet the qualifications established in the MDOT Scope.*

In selecting a service vendor, MDOT identifies a selection team, comprising MDOT employees, to review the proposal information submitted by each vendor and accordingly score each vendor.

The Phase I PM, Pavement Operations Engineer (the PM’s supervisor), and Engineer of CFS comprised the selection team for Phase I. Within the selection documentation for Phase I (MDOT Form 5100E), the selection team documented that “...they [FMI] are knowledgeable on the topic and understand the scope of services.” Also, the selection team stated that “they [FMI] are very

capable and staffed appropriately to provide the desired deliverable within the scope of services for this study....” However, our review of FMI’s proposal did not include information to support the selection team’s assertions. Specifically, FMI’s proposal did not provide any specific references to prior research that FMI has performed. Also, FMI’s proposal did not include a resume or any detailed, specific qualifications for the individual(s) who would conduct the *Study*. In contrast, the other proposer/vendor provided a detailed listing of qualifications and work experiences for all eight members of the team with link to relevant products and publications. In addition, FMI’s proposal did not include detailed information on how FMI would conduct the *Study* while, in contrast, the other proposer included a detailed methodology of the tasks to be performed.

The Phase II Scope included the following as a preferred qualification and criteria for selection: “Engineering expertise and knowledge of aggregate materials, usage, pavement structures, and material properties.” FMI did not assert or demonstrate that it a) possessed any engineering expertise or b) would contract with aggregate experts as part of its work. Despite the apparent inability to meet the scope requirements, MDOT initially selected FMI to perform Phase II. Subsequent to selection, however, FMI backed out of the Phase II engagement because of disagreements with MDOT regarding indemnification language within MDOT’s contract.

MDOT eventually selected the only other proposer, PSC, for Phase II.

Finding 7: MDOT’s interactions with both MAA and FMI might violate MDOT and Civil Service policies on Ethical Standards and Conduct related to a) allowing MAA considerable influence in the development of the study and b) MDOT’s efforts to justify selecting FMI for Phases I and II.

In terms of selection of the vendor MDOT’s Guidance Document 10146, *Ethical Standards and Conduct*, Item C.4 and Civil Service Rule 2.8.2(a)(4) state that “No [classified MDOT employee] shall... Make available any consideration, treatment, advantage, or favor beyond that which is generally granted or made available to others under similar circumstances.”

In creating the Scope for Phase I and Phase II, MDOT disregarded the objections of its subject-matter experts when advertising and procuring the services outlined by MAA. Communications we reviewed indicated that MAA sought a study that would identify a shortage of aggregates in Michigan because of permitting obstacles in developed areas; such an approach pre-determined a solution (remove local control of permits) to a problem that is framed, in part, by the predicted results of the study (currently permitted resources will eventually run out). In an email to the former MDOT Director, the MAA President stated “We [MAA] presume it goes without saying (but we’ll say it anyway!) that we expect the conclusion to be that there is, in certain definable regions of the state, a looming shortage of aggregates that needs to be addressed.” Specifically, it appears that MAA intended to use the MDOT-contracted results of the *Study* to make a case for increased permitting in developed areas which, in turn, would benefit MAA members that seek easier access to mining permits. However, certain subject-matter experts, both within and outside of MDOT, asserted that it might be more beneficial to use modern technology and techniques to identify aggregate sources in less-developed areas. Such modern technology and techniques would assist stakeholders in meeting Michigan’s aggregate needs while minimizing negative impacts to communities – a practice the subject-matter experts assert is standard in surrounding states. MAA’s predicted solution might, therefore, not be the optimal solution for all stakeholders. Such subjugation of MDOT’s informed opinion on statewide needs could be construed as positive

treatment of MAA beyond that which would be made available to others under similar circumstances.

In discussions with us, the MDOT personnel on the Phase I selection team judged FMI's submission to be a poor proposal. It is also notable that FMI was initially among MAA's first choice for suggested vendors for both Phases. As the proposals were received, the Phase I PM stated that his confidence in FMI did not come from FMI's proposal. Instead, he stated that his confidence came from conversations he had had with MAA. Because the PM endeavored to obtain and consider information from outside of FMI's proposal submission in an effort to justify MDOT's selection of FMI, and because FMI's submission was deemed by MDOT to be poor in quality, there are higher-than-acceptable risks that the PM's actions in selecting FMI might be noncompliant with MDOT and State ethical requirements, and that MDOT provided positive treatment of FMI beyond that which would be made available to others under similar circumstances.

Pre-Award Step 7: If price is not a factor in selection (QBS), negotiate a price with the most-qualified vendor using the independent estimate as a baseline for negotiations

Finding: See Finding 4 (within Pre-Award Step 3)

As discussed in Pre-Award Step 3, the Phase I PM did not prepare an independent cost estimate, and therefore has no supportable basis for price negotiations. Also, as discussed in Pre-Award Step 3, the Phase II PM's hours estimate significantly differed from the consultant's proposed hours and, therefore, it is unclear whether one should have relied on the PM's estimate as a basis for price negotiation.

Finding 8: MDOT accepted a profit in excess of the maximum profit allowed by its Reimbursement Guidelines.

Prior to FMI's withdrawal from the Phase II contract, the MDOT PM negotiated and accepted a 35% profit from FMI, indicating that a) the project manager did not negotiate beyond receipt of FMI's price and/or, b) the PM granted FMI a 35% profit without justification. MDOT's Professional Service Reimbursement Guidelines for Bureau of Finance and Administration (Reimbursement Guidelines*) states that the maximum profit will not exceed 11%.

For Phase II and the second vendor it accepted, MDOT appears to have followed its required pricing practices when it negotiated with PSC.

Pre-Award Step 8: Award the contract

Findings: None

MDOT awarded the Phase I Contract to FMI on August 31, 2016, and the Phase II Contract to PSC on December 14, 2018.

Post-Award Step 1: Monitor the vendor's progress and compliance with contract provisions

***Finding 9:** MDOT did not effectively monitor FMI, which did not comply with certain contract provisions necessary for MDOT to evaluate FMI's contractual efforts.*

Throughout the term of the contract, one should reasonably expect that MDOT PMs would monitor key aspects of each vendor's progress, which should likely include a review of any interim contractually-required deliverables, and monitor the consultant's compliance with contract provisions.

Section 10 of FMI's contract with MDOT (Contract 2016-0424) states, "The Consultant will establish and maintain accurate records... of all expenses incurred for which payment is sought or made under this Contract... Separate accounts will be established and maintained by job number for all costs incurred under this Contract."

As part of our investigation, we requested copies of time records for all FMI employees who worked on Phase I. FMI did not provide any time records. According to our communications with FMI, FMI did not establish time records as required by the contract, making it difficult for MDOT to have performed an analysis of FMI's actual level of effort, compared to MDOT's estimate and FMI's proposal. Relatedly, MDOT employees present at the Phase I kick-off meeting on September 14, 2016, asserted to us that FMI presented at the meeting a detailed outline, inclusive of conclusions that did not meaningfully change in the final report. Therefore, it is possible that FMI had a) completed the study prior to contracting with MDOT or b) completed the study in the two-week time period between the contract award date of August 31, 2016, and the kick-off meeting on September 14, 2016.

***Finding 10:** MDOT did not effectively monitor PSC, which did not comply with certain contract provisions necessary for MDOT to evaluate PSC's contractual efforts.*

In regard to Phase II, the Workplan attached to PSC's contract with MDOT (Contract 2018-0854), stated that PSC was required to a) develop a preliminary assessment report, and b) transmit the final report to MDOT by March 30, 2019.

PSC did not provide, and the Phase II MDOT PM did not request, a preliminary assessment report. Also, as of September 26, 2019, PSC has not provided the final report to MDOT.

In addition, the Scope attachment to Contract 2018-0854 states, "On the first of each month, the vendor must submit an electronic monthly progress report to the MDOT Project Manager for work performed during the prior month."

PSC has not provided, and the Phase II MDOT PM has not requested, electronic monthly progress reports. According to both the PM and PSC, PSC provided only verbal updates throughout the term of the Contract. The PM did not provide to us documentation of such verbal updates.

Post-Award Step 2: Determine whether the vendor’s deliverables are acceptable

***Finding 11:** MDOT accepted a report which did not adhere to the Scope.*

The Phase I PM accepted FMI’s report dated October 3, 2016, and distributed the report to MDOT management (some of whom deemed it to be poor in quality).

Per the Phase I Scope attachment to Contract 2016-0424, “Phase I of this study is intended to estimate the overall “permitted” inventory of quality aggregate reserves within the state of Michigan.” However, FMI stated, “In evaluating the adequacy of local reserves in a particular region, we considered the difficulty of permitting new reserves.” [emphasis added]. Based on the Scope, FMI’s *Study* should have evaluated already permitted resources, not the difficulty permitting of new reserves, which is unnecessarily related to recent political discussions on which MDOT has taken no position of which we are aware.

Also, rather than answer the question as to whether the current resources for aggregates will be sufficient to meet the needs of the MDOT highway construction program for the next 30 to 50 years, FMI’s report stated that it intended “to explain the particular dynamics of aggregate supply that exist in different regions of the state” and editorialized on the “difficulty of permitting new reserves...” and the facing of “operating constraints imposed by permitting agencies...”

Although FMI’s report did not adhere to the Scope outlined by MDOT, the Phase I MDOT PM accepted the report.

***Finding 12:** MDOT accepted a report that risks being insufficiently comprehensive, unverifiable, partially irrelevant and, consequently, unreliable.*

Both MDOT subject-matter experts and outside subject-matter experts stated their belief that an appropriate analysis of the question should likely have cost many times more than \$50,000, and would likely have included meaningful geological surveys, LiDAR* imaging, and other related pertinent activities. One such statement from the Phase I PM was that one Michigan university research center could not complete even the initial phase of its proposed study for under \$250,000.

Based on our review of the Phase I report, interviews conducted with both MDOT staff and the Phase II vendor (PSC) that might have relied on the Phase I report, the information included within FMI’s Phase I Report cannot be validated. Contrary to the content contained in most studies, the Phase I report does not include a detailed description of its methodology or information sources one would need to evaluate, validate, and eventually rely on the study. The Phase I report is, from an analytical standpoint, unverifiable. Possibly more important, several MDOT personnel we interviewed regarding the Phase I report questioned the conclusions and reliability of the Phase I report. In addition, PSC stated that it could not validate the Phase I report and, as a consequence, did not place significant reliance on the Phase I report in its efforts to complete Phase II of the *Study*. Specifically, PSC communicated to us that it identified issues with FMI’s Phase I projections. Therefore, we conclude that the level of reliance that should, by a reasonable person, be placed on the Phase I Report is negligible.

Consistent with our conclusion, the Phase I MDOT PM communicated to us that he did not believe FMI's deliverable was a quality report; nor did he believe that a quality report could have been produced in the timeframe that MDOT gave FMI to complete Phase I of the *Study*. The other proposer for Phase I, an organization asserting and specifying relevant experience and knowledge, indicated in its proposal that the *Study* should have been a much larger project, which would include meaningful geological surveys and more extensive research (such as LiDAR mapping). The other proposer specifically stated in its proposal that, "...this resource forecasting effort cannot be completed via the proposed RFP requirements." However, MDOT selected FMI for Phase I and chose not to a) revise its scope, b) perform a more in-depth study, or c) conclude that the proposal, as requested by MAA and as limited to \$50,000, was inappropriate.

Both the unselected Phase I proposer and PSC identified challenges with the Phase I Scope that appear to be eventually reflected in FMI's report. For example, the unselected Phase I proposer stated in its proposal that "There is not a mandatory requirement for [mine] operators to report comprehensive production data on annual or regular basis, anything provided is voluntary. Some operators may provide this information, but others can maintain confidentiality." PSC expressed similar concerns to us. PSC explained to us that information regarding material availability is difficult to gather and depends largely on what providers say (e.g., not reliable or readily verifiable). According to PSC, material [aggregate] availability is very sensitive information that can be used in the competitive market and not everyone is willing to share it. For these reasons, we conclude that the information included in FMI's report is not readily verifiable and reliance upon such information (as presented) carries significant risk of improper reliance.

Despite these considerations, MDOT accepted the report, posted it on the internet, and provided it to others.

Regarding Phase II, PSC has not delivered the Phase II Report to MDOT as of September 26, 2019.

Miscellaneous Findings

Finding 13: MDOT assigned a PM to Phase I with no recent or relevant contracting or project management experience.

For Phase I of the *Study*, the MDOT Engineer of CFS assigned the Concrete Operations and Materials Engineer to be the PM. However, the PM asserted to us that the PM did not have any recent or relevant experience with contracting and the related project management duties.

Finding 14: The design of MDOT's Fraud and Abuse Hotline inhibited an employee from reporting what the employee perceived as potential wrongdoing.

On the topic of this finding, this report does not conclude on whether fraud or abuse occurred in the acquisition of either part of the *Study*. However, in the course of our investigation, on the topic of why MDOT proceeded with contracting the *Study* despite knowledge by some employees of MDOT's noncompliance with several contracting requirements, one MDOT employee a) expressed fear of reprisal for speaking out against the *Study*, b) stated that reprisals at MDOT have occurred, and c) asserted that there was no reasonable way to report the perceived wrongdoing, as all hotline

complaints are routed through MDOT Executive Offices, which ultimately requested and approved the plan for the *Study*.

A properly functioning hotline helps identify potential improprieties and, by its existence, helps prevent improprieties because potential perpetrators might feel at risk of being reported. Therefore, a properly functioning hotline might have prevented many of the observations and findings of this report. Ideally, the design of hotline programs considers whether potential whistleblowers deem the program to be trustworthy. MDOT's hotline routes all assertions of improprieties through MDOT's Executive Offices. When hotline programs might not be deemed sufficiently trustworthy by potential callers, entities employ alternative hotline programs that are structured to be monitored by specialized consultant companies that protect anonymity when communicating with entity audit officials (e.g., our office) and executive management, or directly with audit officials who also protect anonymity.

SUMMARY OF FINDINGS

1. MDOT was not able to provide to us documentation that it objectively-developed an appropriate need-based scope.
2. MDOT did not adhere to its guidelines regarding the preparation of independent cost estimates.
3. MDOT did not adhere to its guidelines regarding RFP Tiers.
4. MDOT did not adhere to its guidelines regarding selection methodology.
5. MDOT does not have effective controls in place to detect and prevent instances of noncompliance with its Selection Guidelines.
6. MDOT selected FMI for both Phases, although FMI's proposal for Phase I was not sufficiently detailed to support the selection criteria or MDOT's conclusions regarding FMI's qualifications. FMI's proposal for Phase II did not meet the qualifications established in the MDOT Scope.
7. MDOT's interactions with both MAA and FMI might violate MDOT and Civil Service policies on Ethical Standards and Conduct related to a) allowing MAA considerable influence in the development of the study and b) MDOT's efforts to justify selecting FMI for Phases I and II.
8. MDOT accepted a profit in excess of the maximum profit allowed by its Reimbursement Guidelines.
9. MDOT did not effectively monitor FMI, which did not comply with certain contract provisions necessary for MDOT to evaluate FMI's contractual efforts.
10. MDOT did not effectively monitor PSC, which did not comply with certain contract provisions necessary for MDOT to evaluate PSC's contractual efforts.
11. MDOT accepted a report which did not adhere to the Scope.
12. MDOT accepted a report that risks being insufficiently comprehensive, unverifiable, partially irrelevant and, consequently, unreliable.
13. MDOT assigned a PM to Phase I with no recent or relevant contracting or project management experience.
14. The design of MDOT's Fraud and Abuse Hotline inhibited an employee from reporting what the employee perceived as potential wrongdoing.

GLOSSARY

CFS – Construction Field Services

Commission – Michigan State Transportation Commission

CSD – Contract Services Division

FMI – FMI Corporation, Inc.

LiDAR - Light Detection and Ranging, is a remote sensing method that uses light in the form of a pulsed laser to measure ranges (variable distances) to the Earth.

MAA – Michigan Aggregates Association

MDOT – Michigan Department of Transportation

PM – Project Manager

PSC – Public Sector Consultants, Inc.

QBS – Qualifications-Based Selection

Reimbursement Guidelines – MDOT’s Professional Service Reimbursement Guidelines for Bureau of Finance and Administration

RFP – Request for Proposal

Scope – Scope of Services

Selection Guidelines – MDOT’s Selection Guidelines for Service Contracts

Shortfall – Difference between local production and consumption

Study – *Michigan Aggregates Market Study* (Phases I and II)