A Whitepaper on:

Alternative Contracting Methods for Pavement Preservation Projects

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ABSTRACT

Pavement maintenance and preservation are important techniques for ensuring longevity of the nation’s asphalt pavement roadway network. The low-bid, design-bid-build contracts that have been used to deliver individual pavement preservation projects can be costly and time-consuming to the owner/agency relative to the project construction costs. Alternative contracting methods (ACMs) that have been used on larger and complex highway projects can and are currently being used for asphalt pavement preservation project delivery. ACMs can accelerate project delivery and consolidate scope, while providing flexible delivery scheduling. Flexibility can reduce overhead in the project development and field management, thus shortening pavement preservation delivery times and reducing cost due to increased volume of work. An important consideration for using an ACM is the evaluation criteria to be used in the selection of prospective contract. This document includes an overview of some agencies’ experience with using ACMs for pavement preservation projects and provides suggestions for moving forward with the use of ACMs for pavement preservation contracts. This document also presents an overview of the more traditional and ACMs, as well as their advantages and disadvantages.

The Federal Highway Administration (FHWA) has an ongoing Accelerated Implementation and Deployment of Pavement Technologies Program, which includes the deployment of innovative technologies to improve pavement performance and reduce agency risk. This report was prepared under Development and Deployment of Innovative Asphalt Pavement Technologies Cooperative Agreement with the University of Nevada, Reno.
### SI* (MODERN METRIC) CONVERSION FACTORS

#### APPROXIMATE CONVERSIONS TO SI UNITS

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**NOTE:** Volumes greater than 1000 L shall be shown in m\(^3\).

| **MASS** | | | | |
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| lb | pounds | 0.454 | kilograms | kg |
| T | short tons (2000 lb) | 0.907 | megagrams (or "metric ton") | Mg (or "t") |

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| fl | foot-Lamberts | 3.426 | candela/m\(^2\) | cd/m\(^2\) |

**FORCE and PRESSURE or STRESS**

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| lb/in\(^2\) | poundforce per square inch | 6.89 | kilopascals | kPa |

#### APPROXIMATE CONVERSIONS FROM SI UNITS

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**ILLUMINATION**

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| cd/m\(^2\) | candela/m\(^2\) | 0.2919 | foot-Lamberts | fl |

**FORCE and PRESSURE or STRESS**

| N | newtons | 0.225 | poundforce | lbf |
| kPa | kilopascals | 0.146 | poundforce per square inch | lbf/in\(^2\) |

*SI is the symbol for the International System of Units. Appropriate rounding should be made to comply with Section 4 of ASTM E380. (Revised March 2003)*
# TABLE OF CONTENTS

Introduction ..................................................................................................................................... 1  
Alternative Contracting Methods for Pavement Preservation ....................................................... 2  
   IDIQ Contracts .......................................................................................................................... 2  
   Single Work Order IDIQ Contract ........................................................................................... 3  
   Single Award IDIQ Contract .................................................................................................... 3  
   Multiple Award IDIQ Contract ............................................................................................... 3  
   Master Agreement .................................................................................................................... 4  
   Project Bundling ..................................................................................................................... 4  
Recent History of FHWA’s use of IDIQ Contracting .................................................................... 4  
Application of Alternative Contracting Methods for Pavement Preservation ............................. 6  
   IDIQ Contracts ...................................................................................................................... 6  
   Project Bundling .................................................................................................................... 8  
   Master Agreement for “On-Call” Services Type Contract ....................................................... 9  
Summary ...................................................................................................................................... 10  
References ................................................................................................................................. 11
LIST OF ABBREVIATIONS AND SYMBOLS

Abbreviations

ACM   Alternative Contracting Method
DOT   Department of Transportation
FHWA  Federal Highway Administration
FLH   Federal Lands Highway
HFST  High Friction Surface Treatment
IDIQ  Indefinite Delivery, Indefinite Quantity
KYTC  Kentucky Construction Cabinet
SEP-14 Special Experimental Project Number 14
VTrans Vermont Agency of Transportation
Alternative Contracting Methods for Pavement Preservation Projects

Introduction

Pavement maintenance and preservation are important techniques for ensuring longevity of the nation’s asphalt pavement roadway network. In the recent past, considerable activity has focused on quantifying pavement preservation benefits providing a wealth of data and information. Traditionally, low-bid, design-bid-build contracts have been used to deliver individual pavement preservation projects. The low-bid procurement method and design-bid-build project delivery method can be costly and time-consuming to the owner/agency relative to the project construction costs, considering that many pavement preservation projects are small in scope.

Alternative project delivery methods, or alternative contracting methods (ACMs), have been used in the transportation industry to accelerate project delivery (i.e., shorten project delivery) and consolidate scope, while providing flexible delivery scheduling and reducing cost due to increased volume of work. In fact, ACM has been used by public agencies for several decades, but under different names. Some of the different names or terms include: job order contracts, push-button contracts, on-call contracts, master contracts, and stand-by contracts.

Most of the ACMs have been used on larger, more complex highway projects. Some of these methods, however, can and are currently being used for asphalt pavement preservation project delivery. For example, the Federal Highway Administration (FHWA) Federal Lands Highway (FLH) Division is using an indefinite delivery, indefinite quantity (IDIQ) Multiple Award Task Order Contract, to package pavement preservation activities in national parks.¹ The Kentucky Transportation Cabinet (KYTC) uses a similar method to bundle multiple projects in delivering high friction surface treatment (HFST) projects through a “Master Agreement” contract.² Other methods include those listed in Special Experimental Project Number 14 (SEP-14) Active Project List to streamline the contracting process in delivering pavement preservation projects.³

Currently, IDIQ contracting requires SEP-14 approval. Under FHWA Notice N5060.2, IDIQ contracting is considered to be an operational method for contracts meeting specific criteria. Contracts not meeting these criteria still require advance SEP-14 approval. The FHWA is in the process of preparing a Notice of Proposed Rule Making for IDIQ contracting. The purpose of the Notice of Proposed Rule Making is to develop regulations to operationalize the use of IDIQ contracting on any Federal-aid construction contract, thus eliminating the need for advance SEP-14 approval.

The primary objective of this document is to review and identify potential ACMs along with evaluation factors that have been or could be used to deliver asphalt pavement preservation projects. In other words, it is an overview of the ACMs that some agencies have used specific to
pavement preservation projects. A secondary objective of the document is to provide suggestions for moving forward with the use of ACMs for pavement preservation contracts.

**Alternative Contracting Methods for Pavement Preservation**

The National Cooperative Highway Research Program synthesis #455, *Alternative Technical Concepts for Contract Delivery Methods*, provides an overview for different alternative contracting methods that have been used for larger highway construction projects. Any contracting method has three main components: (1) delivery method, (2) procurement procedure, and (3) payment provision. The three components also apply to pavement preservation projects, but can be more difficult to apply to smaller pavement preservation projects. The following briefly identifies the individual components, as related to pavement preservation projects.

1. **Project delivery method** is the process by which designers, constructors, and various consultants provide services for design and construction to deliver a complete project. The Designer or owner develops a plan with estimated quantities determined from current field conditions, historical data, and projections of future deficiencies. The amount of a particular work item within a pavement preservation project is often unknown, especially those including localized pavement repairs. Required work is often in response to crashes (past or future) and/or infrastructure failure due to age. Many times, the exact scope of work needed is unknown until the entire item is fully investigated. Often, this cannot occur until after the work begins, especially in regards to a repair.

2. **Procurement procedure** is the process of purchasing and obtaining the necessary property, design, contracts, labor, materials, and equipment to build a project. The Designer or owner is required to estimate the extent of damage and the amount of future work. Large amounts of contingency items are sometimes used to cover unknowns. When work exceeds the contingency amounts, the Project Engineer has to write change orders, if actual quantities exceed plan quantities.

3. **Contract payment provision** is the contract language that defines how design and construction professionals receive payments for their services. Estimating and maintaining a budget for pavement preservation contracts is difficult. Because of the inherent unknowns and the requirement to be flexible in responding to future maintenance, agencies need flexibility in managing these routine maintenances or pavement preservation contracts. Flexibility can reduce overhead in the project development and field management, thus shortening pavement preservation delivery times.

The remainder of this section provides an overview and definition of the ACMs that have been applied with success to pavement preservation projects.

**IDIQ Contracts**

Every project to be executed within an IDIQ contract is developed under the issuance of a work order. A work order becomes the contract document that determines the location, contract time,
and scope of work. Moreover, a work order outlines all required pay items, quantities, and unit prices.(6)

For the purposes of this document, the decision on whether or not to establish “stated limits” on the quantities of work to be ordered under a given IDIQ contract is optional at the state level and depends on constraints found in state regulations or on a given agency’s preferences. Thus, this document defines IDIQ contracts as those contracting approaches that involve the procurement of an indefinite quantity of supplies and/or services on an as-needed basis using individual orders over a fixed period of time. An order may be termed as a work order, task order, delivery order, or job order.

**Single Work Order IDIQ Contract**

A single contract is awarded to a single contractor. Once the need to issue the work arises, the contractor then performs the desired services or furnishes the requisite supplies or a single work order issued during the contract period.(7) In general, a single work order IDIQ contract is a poor candidate and historically have not been used for pavement preservation. Contract characteristics of the single work order IDIQ contracts include:

- The agency foresees a future necessity that will be fulfilled with one work order, but cannot determine the total quantity of resources that will be ultimately required and/or the final delivery schedule.
- Used for emergency stand-by services, such as hurricane debris removal and pot hole repair and other safety related issues.

**Single Award IDIQ Contract**

A single contract is advertised and awarded to a single contractor who then is awarded work orders based on the pricing furnished in the initial bid package.(7) Contract characteristics of the single award IDIQ contracts include:

- Repetitive services contained in a narrow scope of work allow a certain degree of uniformity among work orders;
- Only one contractor has the capabilities to perform all work orders to be issued under the IDIQ contract; or
- The agency determines that the ultimate number of work orders to be issued under the IDIQ contract does not justify awarding multiple contractors.

**Multiple Award IDIQ Contract**

A single contract is advertised and a pool of qualified contractors is selected. Only those selected are subsequently allowed to bid on work orders. In most cases, the work orders are awarded to the lowest bidder among the pool of contractors.(7) Multiple award IDIQ contracts remain experimental under SEP-14 until FHWA issues a final rule for IDIQ contracts, as stated in the Introduction. Contract characteristics of the multiple award IDIQ contracts include:

- Repetitive services contained in a broad scope of work make it hard to determine a typical composition of work orders.
• More than one contractor has the capabilities to perform all work orders to be issued under the IDIQ contract.
• The agency determines that the number of work orders to be issued under the IDIQ contract justify awarding multiple contractors.

Master Agreement
A master agreement is a contract between an agency and a contractor or consultant (providing a specific service), in which both agree to the terms that govern future transactions or work orders under the master agreement. A master agreement allows the agency and contractor to easily and quickly negotiate future work, because they can rely on the master agreement base for future work, so that the same terms need not be repetitively negotiated, and you only need to negotiate terms specific to the latest work element.

A master agreement is not the same as an IDIQ work order, because it does not specify quantities for a particular location. Some State Departemen of Transportations (DOTs) (for example, the Georgia DOT) use the master agreement for conducting research projects for special projects that include a phased approach where phase 1 provides information to phase 2 and phase 2 provides information to phase 3. The master agreement is for the overall project and future transactions or work for the individual phases refer to the master agreement. As such, master agreements can be used for preservation projects located in different districts and along different roadways.

Project Bundling
Project bundling is a process for which a single contract award is used to contract for the preservation, rehabilitation, and/or replacement of multiple structure locations. Project bundling is not a contracting method by itself and can be used with any contracting method. Project bundling, however, was one of the alternative contracting methods demonstrated and used under the FHWA Every Day Counts-5 initiative.

A project bundling contract may be delivered in several different ways and may include both design and construction in the overall scope, depending on the ACM. A project bundling program targets a defined set (or bundle) of projects that are planned by an agency in a timely and efficient manner through a series of project bundling contracts with the support of various funding options and/or partnerships. A bundling program may include the program completion time frame, and the size of the bundling program will vary depending on the agency’s needs and type of work.

Preservation projects may be easily bundled together across counties, districts, or regions to develop the quantity of work that minimizes bid prices and maximizes competition. An agency can also partner and combine projects to attract more competition. However, very few agencies have used the project bundling delivery method for pavement preservation projects. Most agencies have used project bundling for larger resurfacing projects and bridge preventive maintenance or replacement.

Recent History of FHWA’s use of IDIQ Contracting
Since 2007, FHWA has allowed the experimental use of IDIQ contracts for Federal-aid construction projects through SEP-14 authority of 23 U.S.C. 502(b)(2) to improve on the
contracting process. The Federal Acquisition Regulation defines IDIQ contracting as a method that “provides for an indefinite quantity, within stated limits, of supplies or services during a fixed period.” In other words, providing supplies and services on an as-needed basis using individual orders over a specific period of time. Procurement can occur through different methods depending on the pavement preservation project attributes, goals, and constraints. Consideration is given to identifying the important factors, including bid items, that are necessary to be included in ACMs when used specifically for asphalt pavement preservation projects. Historically, the criteria used in the evaluation of prospective contracts have included: Past Performance, Logistics, Contract Team and Qualifications, and Financial Capability and Capacity.

The FHWA gained experience through these experiments to operationalize this contract type in limited circumstances. Additionally, the United States Senate reports accompanying fiscal years 2017 and 2018 appropriations recommended that FHWA operationalize job order contracts, a form of IDIQ contracting, for all Federal-aid funded projects. IDIQ type contracts are being used more commonly across different disciplines and services and are applicable to pavement preservation projects. As noted in the previous section, the FHWA FLH Division uses the IDIQ contracting method to execute pavement preservation projects in national parks.

IDIQ contracting approaches are grouped into single and multiple work order contracts. The multiple work order contracts are further grouped into a single- and multiple-award contracts. These contracts are most often used to procure services of a repetitive nature and whose scope is quite narrow and clear, allowing a greater control over pricing. For example, an IDIQ contract to complete an indefinite amount of pavement overlay is a typical scope limitation for a single award IDIQ contract.

On May 2, 2018, FHWA published a Federal Register Notice and Request for Comments on a proposal to operationalize IDIQ and Job Order Contracts for low-cost construction contracts. This notice allowed FHWA to authorize IDIQ projects without SEP-14 approval for low-cost contracts. Low-cost contracts are defined as competitively bid, short term (1- or 2-year) contracts that qualify as a categorical exclusion under 23 Code of Federal Regulations (CFR) 771.117 and where the total value of work orders does not exceed $2,000,000 per year.

On June 26, 2018, the FHWA published an Advance Notice of Proposed Rule Making in the Federal Register. The Advance Notice of Proposed Rule Making seeks comments on how FHWA may further expand this contracting method on a permanent basis. Possible expansions included, but were not limited to: best value awards, multiple award contracts, and IDIQ projects exceeding the low-cost criteria.

On January 18, 2019, Deputy FHWA Administrator Hendrickson signed FHWA Notice N5060.2 on IDIQ contracting for low-cost federal-aid construction contracts. Although this Notice allows State agencies to use IDIQ contracting and job order contracts for low-cost federal-aid construction contracts without advance SEP-14 approval on a project-by-project basis, the IDIQ contracting and job order contracting methods continue to be administered under the SEP-14
program. Under the FHWA Notice, IDIQ and job order contracts meeting all of the specified factors listed below do not need prior SEP-14 approval:

1. The IDIQ or job order contract must be a low-cost contract, defined as:
   a. A short-term (1 to 2 year) base contract. With FHWA approval, however, the base contract may be extended but the maximum length of the contract period with extensions not exceeding 5 years.
   b. Awarded by competitive bidding to the lowest responsive bidder.
   c. A contract where the total value of task or work orders does not exceed $2,000,000 per year on average over the contract term.
2. The contract is a single-award, work order contract. Approval for multiple awards for work order contracts do require SEP-14 approval.
3. The actions covered by the contract will be for construction projects qualifying for National Environmental Policy Act categorical exclusions listed under 23 CFR 771.117.\(^\text{(14)}\)
4. The work complies with all applicable Title 23 requirements during construction, such as the applicable sections of Form FHWA-1273 (Required Contract Provisions for Federal-aid Construction Projects), job site poster requirements, environmental commitments, etc.\(^\text{(17)}\)
5. The award of the contract and the performance of the project complies with applicable Disadvantaged Business Enterprise provisions of 49 CFR part 26.\(^\text{(18)}\)

**Application of Alternative Contracting Methods for Pavement Preservation**

**IDIQ Contracts**

Some agencies have recognized the value of using the IDIQ and other types of contracts for repetitive services, such as pavement preservation projects. Examples of this use are briefly described in the following paragraphs. It should be noted, as stated in the Introduction, projects that do not meet the criteria in FHWA Notice N5060.2 will need SEP-14 approval on federally-funded projects. The FHWA is in the process of preparing the NPRM for IDIQ contracting to develop regulations that operationalize the use of IDIQ contracting on any Federal-aid construction contract.

- The Ohio DOT requested SEP-14 approval for the implementation of a pilot program evaluating the merits of an IDIQ contracting method. The purpose of using the SEP-14 IDIQ contract was to better establish project budgets during the planning phase and to minimize the overall number of change orders during construction. Furthermore, the IDIQ contract method resulted in shorter project delivery periods and reduced emergency type contracts with an “on-call” contractor.\(^\text{(19)}\)

The Ohio DOT utilized the IDIQ contract method to competitively bid projects with an indefinite amount of quantity for given work items with work limited to a geographical region. Contractors competitively bid “estimated” individual work items within the contract without knowing actual quantities or exact work locations. The overall contract value and duration is set by Ohio DOT prior to bid time. The contract expires upon reaching
the known fixed amount or the pre-established timeframe set forth in the contract, whichever comes first.

The contract permitted one final change order to either extend the duration of the project or extend the contract value. In order to reduce the risk of prospective bidders and to gain better unit costs, Ohio DOT established a “minimum anticipated usage” table within the contract for work items which Ohio DOT has a reasonably assured expectation of need. The table defined which contract items the contractor is compensated for in regards to delivered or stored materials. The minimum amount of contract items and quantities to be used on the contract are specified in the plans in an effort to provide more confidence during the bidding phase for contractors.(19)

- The Vermont Agency of Transportation (VTrans) requested SEP-14 approval for the implementation of an IDIQ contracting method for certain categories of preventive maintenance and repair services.(20) Some expected benefits of the IDIQ contracting method, which replaced an outdated system of retainer contracts known as “Category II Maintenance Rental Agreements” in most categories are:

  - A better system for project budgeting during the planning phase.
  - A more competitive means of selecting contractors.
  - A reduction in administrative burden for the State and contractors.
  - Shorter project delivery periods, especially under emergency conditions.
  - More flexibility during construction.
  - Reduce risk in cost estimates.
  - Improvement upon previous SEP-14 work plan: Using Maintenance Rental Agreements for Preventive Maintenance (Oct. 2013).

IDIQ primary contracts were awarded in each work category and cover all regions within the State. Bidders can submit proposals for primary contracts in one or more categories of work, and for one or more regions. Bidders selected for primary IDIQ contracts become part of a “pool” of contractors who are solicited to bid on Task Orders for specific tasks in the categories of work and regions covered by their primary contracts. VTrans awards primary IDIQ contracts in the best interest or “best value” to VTrans. In making the best interest determination, the selection panel evaluates proposals based upon the following three primary factors:

  - Business Structure
  - Past Performance
  - Experience

Prequalifications can be an additional factor to address work quality, which can be addressed through the past performance and experience factors. Contractor’s availability can also be a selection criterion to ensure the agency has an adequate contractor pool to
cover the needs of the agency in all regions. More detail for each work order or project task is provided in the Request for Proposals. Task bid requests for defined tasks are issued to all primary contract holders in the relevant “pool” and task orders for specific tasks are awarded to the lowest-priced, responsive and responsible bidder in that pool.

Each primary IDIQ contract includes a set of federally-required provisions that apply when federal funding is part of a specific task. Every task bid request indicates whether those federal provisions apply to the specific task, and all federal requirements are met when completing these tasks. Primary IDIQ contracts have an initial duration of three years, with the option to renew for two additional one-year periods at the agency’s discretion. The duration time, however, can vary. To encourage healthy competition, agencies can provide bidders not initially selected for primary contracts with an opportunity to compete for primary contracts during the contract period, with the agency awarding additional primary contracts as deemed necessary. This process is known as the “On Ramp” by VTrans.

To maintain high quality work among primary contract holders, VTrans assesses vendor performance at the primary IDIQ contract level at least annually and at the task order level upon the completion of individual task orders. VTrans can also terminate any primary contract at any time when it determines that a contractor previously awarded a primary contract has not delivered adequate performance or has demonstrated a lack of availability. This process is known as the “Off Ramp” by VTrans.

Project Bundling
Oregon DOT is one of the State DOTs that have used the project bundling method extensively, but mostly for bridge related maintenance and replacement projects. Some other State DOTs that have used project bundling include: California, Colorado, Delaware, Georgia, Indiana, Missouri, Nebraska, New York, Ohio, and Pennsylvania. However, most of the projects have been related to bridges and culverts. FHWA developed a Bridge Bundling Guidebook. The Guidebook includes a 10-step process that applies to other types of projects and work. The Colorado DOT bundled smaller individual culvert improvement projects for the development of a culvert expansion program for wildlife mitigation to reduce wildlife-vehicle crashes. Project bundling has been referred to by other terms, one of those terms is “piggybacking.” As an example, several jurisdictions in northern California bundled or piggybacked microsurfacing/slurry seal work to get a better price under one contract.

FHWA is encouraging the use of project bundling to deliver pavement maintenance and preservation type contracts. FHWA Central FLH Division used the project bundling project delivery approach on a 49 million dollar emergency contract to repair roadways and repair and replace bridges within the same corridor. The American Association of State Highway and Transportation Officials Committee on Construction issued a questionnaire regarding bundling in 2018. Replies to the questionnaire indicated that project bundling was mainly used for pavement resurfacing and reconstruction, bridge maintenance and replacement, and guardrail installation. Bundling was used for preventive maintenance, but most of the maintenance work was applied to
bridges and other structures. In addition, most of the bundled projects were confined by geographic and corridor criteria. More importantly, the benefit described by the responses were a minor cost and time savings, but no difference in comparison to conventional contracting methods. The other important reply was no agency has developed bundling guidelines. Indiana and Washington DOTs, however, are starting the process to develop bundling guidelines.

Indiana DOT initiated research through Purdue University into using the project bundling for pavement maintenance and preservation. An initial key finding from the work is that road bundles were not cost effective or beneficial unless the bundles were within the same corridor. In addition, Indiana suggested not mixing interstate and non-interstate road bundles. The best bundling opportunities were found by bundling road projects by corridor, work types, and geographic location.\(^{(8,22)}\)

**Master Agreement for “On-Call” Services Type Contract**

Pavement preservation projects can also include “spot treatments.” As an example, HFST is a spot treatment applied to an existing highway surface that increases the surface friction characteristics, allowing for better skid resistance. The KYTKentucky developed and used a Master Agreement to rapidly implement and place HFSTs along specific roadway segments with increased crashes. The master agreement is similar to a single award IDIQ type contract. The following briefly identifies and explains major parts of the “Master Agreement” contracting process used by the KYTC for these types of projects:\(^{(2)}\)

- Initially, KYTC executed a “Master Agreement” contract (i.e., “on-call” contract) with one contractor. The draft master agreement included a statement that if the contractor performed well, then future work would be issued. In other words, future work issued under the master agreement was dependent on the contractor’s performance. This statement was removed in the final agreement. The KYTC master agreement does include an optional renewal period to extend the agreement three additional one-year periods. The KYTC elected to use this master agreement contract method to enhance the probability of success and expanded it to include other contractors. As a result, KYTC realized the benefits desired for both the agency and contractor. The contractor gained valuable experience on how to develop and execute an effective HFST program. When issues did arise, the contractor remedied them on site or repaired the area quickly.

- Upon the expiration of the Master Agreement, KYTC started contracting for HFST installations using a competitive regional area contracting method. The regional area contracts generally cover one construction season. Based on KYTC’s experiences from the original Master Agreement, current specifications have been enhanced and overall contracting costs have decreased.

As a result of the success with HFSTs, KYTC has expanded the use of master agreement type contracts. KYTC uses state-funded master agreements for pavement preservation and other items, such as: guardrail repair, bridge repairs, equipment rental, and traffic signal maintenance.
Under Kentucky statutes (KRS 45A.050(3)), political subdivisions, including cities of all classes, counties, and school districts, may participate in all state agency Master Agreements to the same extent as agencies of the Commonwealth [of Kentucky]. For audit purposes, KYTC recommends that local governments, schools, and universities maintain on file a copy of the following items: state Master Agreement; the master agreement catalog (if applicable); the customer's order form; the final "build" sheet that was agreed upon by the vendor and the customer, where applicable; receipt documents indicating the item was delivered correctly; payment information (date and check number), etc. More recently, KYTC has considered the use of IDIQ contracts as allowed by FHWA Notice N5060.2 for safety and pavement preservation type projects.

**Summary**

In summary, multiple agencies have found that ACMs can accelerate project delivery and consolidate scope, while providing flexible delivery scheduling, especially for pavement preservation type projects. Flexibility can reduce overhead in the project development and field management, thus shortening pavement preservation delivery times and reducing cost due to increased volume of work.
References


