

## ENGINEERING SERVICES AGREEMENT

THIS IS AN AGREEMENT made as of July 5  
~~June 22~~, 2018, between the LEXINGTON-FAYETTE URBAN COUNTY GOVERNMENT (**OWNER**) and Applied Research Associates located at 4300 San Mateo Blvd., NE, Suite A220, Albuquerque, New Mexico 87110 (**CONSULTANT**). **OWNER** intends to proceed with the Pavement Management System and Data Collection as described in the attached Exhibit A, "**Proposal of Engineering Services and Related Matters.**" The services are to include customary civil engineering services as related to completion and submission of reports and deliverables as described in Exhibit A, detailing the findings of all field inspections, inventory and required analysis completed by the **CONSULTANT**. The services are hereinafter referred to as the **PROJECT**.

**OWNER** and **CONSULTANT** in consideration of their mutual covenants herein agree in respect of the performance of professional engineering services by **CONSULTANT** and the payment for those services by **OWNER** as set forth below.

**CONSULTANT** shall provide professional consulting services for **OWNER** in all phases of the **PROJECT** to which this Agreement applies, serve as **OWNER'S** professional engineering representative for the **PROJECT** as set forth below and shall give professional consultation and advice to **OWNER** during the performance of services hereunder.

### SECTION 1 - BASIC SERVICES OF CONSULTANT

#### 1.1. General

**CONSULTANT** shall perform professional services as hereinafter stated that include customary civil engineering services incidental thereto.

#### 1.2. Project Phase

After written authorization to proceed, **CONSULTANT** shall:

- 1.2.1. Notify the **OWNER** in writing of its authorized representative who shall act as Project Engineer and liaison representative between the **CONSULTANT** and the **OWNER**.
- 1.2.2. The **CONSULTANT** must perform all duties necessary to fully complete the deliverables described in attached Exhibit A "Proposal of Engineering Services and Related Matters" and amendments to the **CONSULTANT'S** proposal included in attached Exhibit C "Further Description of Basic Engineering Services and Related Matters."

To the extent of any conflict among the provisions of these documents and/or this Agreement, the provisions of this Agreement shall control, followed by the provisions of **EXHIBIT A**, then **EXHIBIT C**.

- 1.2.3** The **CONSULTANT** shall provide written documentation of all meetings and be responsible for incorporating all comments and changes resulting therefrom in final work product.
- 1.2.4.** The **CONSULTANT** shall post all initial draft work products on the project document management portal. If the project document management portal is not functional on the draft posting date, the **CONSULTANT** shall submit five (5) copies (hardcover) of all initial draft final work products for this **PROJECT**. The copies of the initial draft final reports are submitted for review and comment by the **OWNER**, and should be presented in person to the **OWNER**.
- 1.2.5.** After the **OWNER'S** detailed review, the **CONSULTANT** will revise the initial draft final for all work products for this **PROJECT**, and the **CONSULTANT** shall post all draft final work products on the project document management portal. If the project document management portal is not functional on the draft posting date, the **CONSULTANT** shall submit five (5) copies (hardcover). One electronic copy of the all work products for this **PROJECT**, including all appendices, shall be provided and prepared in such a manner that it can readily be converted to a quick-link accessible form for the **OWNER'S** Website. The **OWNER** shall have ten (10) business days within which to accept or deny each such final draft. If is denied, the **OWNER** shall provide a detailed explanation in writing for the basis of such denial. Once the **OWNER** accepts the draft as final, a total of ten (10) final copies (hardcover) are required in addition to an electronic copy.
- 1.2.6** Immediately notify **OWNER** of any delay in the delivery of a work product or deliverable, regardless of cause. Give written notice to **OWNER** within five (5) business days whenever **CONSULTANT** observes or otherwise becomes aware of any development that affects the scope or timing of **CONSULTANT'S** services, or any defect in the work of Contractor(s).

## **SECTION 2 - EXTRA WORK BY CONSULTANT**

- 2.1.** The **OWNER** may desire to have the **CONSULTANT** perform work or render services in connection with this **PROJECT** other than provided by the expressed intent of this Agreement. Such work shall be considered as "Extra Work", subject to a change order, supplemental to this Agreement, setting forth the character and scope thereof and the compensation therefore. Work under such change order shall not proceed until the **OWNER** gives written authorization. Should the **OWNER** find it desirable to have previously satisfactorily completed and accepted plans or parts thereof revised, the **CONSULTANT** shall make such revisions as directed, in writing, by the **OWNER**. This work shall be considered as "Extra Work" and shall be paid as such.
- 2.2.** All "Extra Work" is subject to prior written authorization of **OWNER** and necessary appropriations made by the Urban County Council.

### **SECTION 3 - OWNER'S RESPONSIBILITIES**

#### **OWNER shall:**

- 3.1. Provide criteria and information as to **OWNER'S** requirements for the **PROJECT**, including design objectives and constraints, space, capacity and performance requirements, flexibility and expandability, and any budgetary limitations.
- 3.2. Assist **CONSULTANT** by placing at his disposal available information pertinent to the Project.
- 3.3. Examine all studies, reports, sketches, drawings, specifications, proposals and other documents presented by **CONSULTANT**, and render in writing decisions pertaining thereto within a reasonable time so as not to delay the services of **CONSULTANT**.
- 3.4. Designate in writing a person to act as **OWNER'S** representative with respect to the services to be rendered under this Agreement. Such person shall have complete authority to transmit instructions, receive information, interpret, and define **OWNER'S** policies and decisions with respect to materials, equipment, elements, and systems pertinent to **CONSULTANT'S** services.
- 3.5. Give written notice to **CONSULTANT** whenever **OWNER** observes or otherwise becomes aware of any development that affects the scope or timing of **CONSULTANT'S** services, or any defect in the work of Contractor(s).
- 3.6. Furnish or direct **CONSULTANT** to provide, necessary Extra Work as stipulated in Section Two (2) of this Agreement or other services as required.

### **SECTION 4 - PERIOD OF SERVICES**

- 4.1. Time is of the essence in the performance of this Agreement. See the Schedule chapter of Exhibit A " Proposal of Engineering Services and Related Matters for the project schedule.
- 4.2. The provisions of this Section Four (4) and the various rates of compensation for **CONSULTANT'S** services provided for elsewhere in this Agreement have been agreed to in anticipation of the orderly and continuous progress of the **PROJECT** through completion.
- 4.3. If a delay results from the acts of **OWNER** or another entity that is required to permit or approve the work or services, an extension of time for such delay will be considered by **OWNER**.
  - 4.3.1. If the above type of delay occurs and **CONSULTANT** wants an extension of time, it must, within ten (10) days from the date of the delay, apply in writing to **OWNER** for an extension of time for a reasonable period, which must be agreed upon by **OWNER**.
  - 4.3.2. If the extension of time is approved by **OWNER**, the **PROJECT** schedule/Final Task Order shall be revised to reflect the extension. Such extension of time to the completion date shall in no way be construed to operate as a waiver on the part of **OWNER** of any of its other rights in the Agreement.
  - 4.3.3. If the above type of delay would prevent complete performance of the **PROJECT**/Final Task Order within ninety (90) days of the time specified therein, **OWNER** shall have the option of cancelling the **PROJECT**/Final

Task Order or otherwise adjusting the scope of the services or work and any related fees.

**4.3.4.** If the parties cannot mutually agree to an extension of time or an adjustment, Section 6.5 under “DISPUTES” of this Agreement shall apply.

**4.4.** If delays result solely by reason of acts of the **CONSULTANT**, the **CONSULTANT** must immediately notify the **OWNER** in the event of such delay, and provide the **OWNER** a written action plan within five (5) business days on how it will reasonably attempt to resolve the delay. If the parties cannot mutually agree to an extension of time or an adjustment, Section 6.5 under “DISPUTES” of this Agreement shall apply. If the above type of delay would prevent complete performance of the **PROJECT**/Final Task Order within ninety (90) days of the time specified therein, **OWNER** shall have the option of cancelling the **PROJECT**/Final Task Order or otherwise adjusting the scope of the services or work and any related fees.

## **SECTION 5 - PAYMENTS TO CONSULTANT**

**5.1. Methods of Payment for Services of CONSULTANT.**

**5.1.1. For Basic Services**

**CONSULTANT** shall receive prior written approval of **OWNER** prior to proceeding with work items and deliverables in **EXHIBIT A**. **OWNER**'s designated agent in Section 8.1.1 shall be the only person authorized to provide such approval. For all work items and deliverables listed in **EXHIBIT A**, prices shall be as listed in the Costs section. **OWNER** will be billed on a monthly basis based for the tasks completed by the **CONSULTANT** in the previous month, in accordance with the rates in the table below:

Task No.	Task Name	Unit Cost	Quantity	Units	Total Cost
1	Management & Kickoff	\$ 18,600.00	EA	1	\$ 18,600.00
2	Records Review	\$ 1,000.00	EA	1	\$ 1,000.00
3	Data Collection	\$ 98.06	per mile	1,260	\$ 123,558.86
4	Condition Evaluation	\$ 99.88	per mile	1,260	\$ 125,851.89
5	Data Upload	\$ 13,600.00	EA	1	\$ 13,600.00
6	Curb Survey	\$ 10.73	per mile	1,072	\$ 11,503.91
7	Implementation	\$ 9,200.00	EA	1	\$ 9,200.00
8	Training	\$ 15,900.00	EA	1	\$ 15,900.00
9	Presentation	\$ 9,500.00	EA	1	\$ 9,500.00
<b>TOTAL</b>				<b>TOTAL</b>	<b>\$ 328,714.66</b>

**5.1.2. For Extra Work**

Subject to the prior written authorization of **OWNER**, the execution of a change order, supplemental to this agreement, setting forth the character and scope of extra work to be performed and the compensation therefore, and the necessary appropriations by the Urban County Council, **OWNER** shall issue individual task orders for each work assignment performed under this Agreement by **CONSULTANT** or its sub-consultant/s that are not included in **EXHIBIT A**. Each task order shall contain scope of work, fee, and schedule for performance of the work. Individual task orders shall be of the form included in **EXHIBIT C**.

**5.1.2.a** Fee payable to **CONSULTANT** under individual task order shall be developed using hourly rates included in **EXHIBIT C** or as amended in accordance with provisions therein.

**5.1.2.b** Terms of payment to **CONSULTANT** shall be specified in each task order. For assignments with defined scope, lump sum task orders shall be issued. Otherwise, task orders shall include time and materials payment terms.

**5.1.2.c** Each task order issued shall receive prior written approval of **OWNER** prior to **CONSULTANT** proceeding with said work. The **OWNER's** designated agent

in Section 8.1.1. shall be the only person authorized to provide such approval.

**5.2. Times of Payment**

**5.2.1. CONSULTANT** shall submit monthly statements for Basic Services and Extra Work rendered. The Statements will be based upon **CONSULTANT'S** estimate of the proportion of the total services actually completed at the time of billing. **OWNER** shall respond to **CONSULTANT'S** monthly statements within thirty (30) days, either denying payment or making payment.

**5.3. Other Provisions Concerning Payments**

**5.3.1.** In the event the Agreement is terminated by the **OWNER** without fault on the part of the **CONSULTANT**, the **CONSULTANT** shall be paid for the work performed or services rendered for which it has not already been paid as determined by mutual agreement between the **OWNER** and the **CONSULTANT**.

**5.3.2.** In the event the services of the **CONSULTANT** are terminated by the **OWNER** for fault on the part of the **CONSULTANT**, the **CONSULTANT** shall be paid reasonable value of the work performed or services rendered and delivered for which it has not already been paid, and the amount to be paid shall be determined by the **OWNER**.

**SECTION 6 - GENERAL CONSIDERATIONS**

**6.1. Termination**

**6.1.1. CONSULTANT may only terminate this Agreement** due to **OWNER'S** material breach of the terms hereof which breach causes **CONSULTANT** to be unable to perform its duties and responsibilities under this Agreement and upon forty-five (45) days written advance notice to **OWNER**.

**6.1.2.** The **OWNER** may terminate this Agreement for cause upon seven (7) business days written advance notice to the **CONSULTANT**. The **OWNER** reserves the right to terminate the Agreement for any reason whatsoever, with or without cause, at any time upon thirty (30) days written advance notice to the **CONSULTANT**.

**6.2. Ownership and Reuse of Documents**

All documents, including raw data, reports, Drawings and Specifications, prepared by the **CONSULTANT** pursuant to this Agreement shall be delivered to and become the property of the **OWNER**. The **OWNER** shall have the right to reuse same without restriction or limitation, but without liability or legal exposure to **CONSULTANT**.

### **6.3. Legal Responsibilities and Legal Relations**

**6.3.1.** The **CONSULTANT** shall familiarize himself with and shall at all times comply with all federal, state, and local laws, ordinances, and regulations that in any manner affect the services of this Agreement.

**6.3.2.** In performing the services hereunder, the **CONSULTANT** and its consultants, employees, agents and representatives shall not be deemed or construed to be employees of **OWNER** in any manner whatsoever. Except as otherwise provided in this Agreement, the **CONSULTANT** shall be acting as an independent contractor. The **CONSULTANT** shall not hold itself out as, nor claim to be, an officer or employee of **OWNER** by reason hereof and shall not make any claim, demand or application to or for any right or privilege applicable to an officer or employee of **OWNER**. The **CONSULTANT** shall be solely responsible for any claims for wages or compensation by **CONSULTANT'S** employees, agents and representatives, including consultants, and shall save and hold **OWNER** harmless therefrom.

**6.3.3.** The parties hereto agree that causes of actions between the parties shall be governed by applicable provisions of the Kentucky Revised Statutes, and that venue of any legal action shall be a court of appropriate jurisdiction in Fayette County, Kentucky. The parties further agree that Kentucky law shall apply with respect to the interpretation of any provision of this Agreement.

### **6.4. Successors and Assigns**

**6.4.1.** **CONSULTANT** binds itself and his partners, successors, executors, administrators, assigns and legal representatives to this Agreement in respect to all covenants, agreements, and obligations of this Agreement. **CONSULTANT** shall not assign any interest, obligation or benefit in this Agreement. **CONSULTANT** shall not assign any interest, obligation or benefit in this Agreement nor transfer any interest in the same, whether by assignment or novation, without prior written consent of **OWNER**.

**6.4.2.** The **CONSULTANT** shall not subcontract more than fifty percent (50%) of the work, based upon dollar value of the work. The **CONSULTANT** shall obtain written approval prior to subletting or assigning any services contained in this Agreement, and consent to sublet or assign any part of this Agreement shall not be construed to relieve the **CONSULTANT** of any responsibility for compliance with the provisions of this Agreement.

**6.4.3.** Nothing herein shall be construed to give any rights or benefits hereunder to anyone other than **OWNER** and **CONSULTANT**.

### **6.5. Disputes**

Except as otherwise provided in this Agreement, any dispute hereunder may be resolved by agreement of the **OWNER'S** Agent (Section 8.1.1) and the **CONSULTANT**. In the absence of such an agreement, the dispute shall be submitted to the **OWNER'S** Commissioner, Department of Environmental Quality & Public Works, whose decision shall be final and conclusive unless determined by a court of competent jurisdiction to have been fraudulent, capricious, arbitrary, or so grossly erroneous as necessarily to imply bad faith. Pending a final decision of a dispute hereunder, the **CONSULTANT** shall proceed diligently with the performance of the Agreement in accordance with the directions of the **OWNER**.

#### **6.6. Accuracy of CONSULTANT'S Work**

The **CONSULTANT** shall be required to perform this Agreement in accordance with the degree of ordinary and reasonable skill and care usually exercised by professional engineers prevailing at the time, place and under similar conditions as the services hereunder are rendered.

The **CONSULTANT** shall be responsible for the accuracy of all work, even though raw data, reports, Drawings and Specifications have been accepted by the **OWNER**, and it shall make any necessary revisions or corrections resulting from its errors and/or omissions for no additional compensation. By submission of reports, soils and subsurface information, quantities estimates, calculations and Drawings and Specifications to the **OWNER**, the **CONSULTANT** has made an incontrovertible representation that the information is accurate within the appropriate standard of skill and care. Failure on the part of **CONSULTANT** to provide the expected level of accuracy may be grounds for the **OWNER** to terminate this Agreement.

#### **6.7. Security Clause**

The **CONSULTANT** certifies that he shall not at any time release or divulge any information concerning the services covered by this Agreement to any person or any public or private organization except the **OWNER** without prior approval of the **OWNER** unless required by law

#### **6.8. Access to Records**

The **CONSULTANT** and his sub-consultants shall maintain all books, documents, papers, and accounting records, and make such materials available at their respective offices at all reasonable times during the Agreement period and for three (3) years from the date of final payment under the Agreement for inspection by the **OWNER**, and copies thereof shall be furnished if requested. Failure to maintain such records for three (3) years after the date of final payment may be grounds for the **OWNER** to disqualify the **CONSULTANT** from consideration for future consultant engineering Agreements.

#### **6.9. Risk Management Provisions, Insurance and Indemnification**

##### **6.9.1. DEFINITIONS**



The **CONSULTANT** understands and agrees that the Risk Management Provisions of this Agreement define the responsibilities of the **CONSULTANT** to the **OWNER**.

As used in these Risk Management Provisions, the terms “**CONSULTANT**” and “**OWNER**” shall be defined as follows:

- a. **CONSULTANT** means the consultant and its employees, agents, servants, owners, principals, licensees, assigns and subcontractors of any tier.
- b. **OWNER** means the Lexington-Fayette Urban County Government and its elected and appointed officials, employees, agents, boards, assigns, volunteers, and successors in interest.

#### **6.9.2. INDEMNIFICATION AND HOLD HARMLESS PROVISION**

(1) It is understood and agreed by the parties that Consultant hereby assumes the entire responsibility and liability for any and all damages to persons or property caused by or resulting from or arising out of any act or omission on the part of Consultant or its employees, agents, servants, owners, principals, licensees, assigns or subcontractors of any tier (hereinafter “Consultant”) under or in connection with this agreement and/or the provision of goods or services and the performance or failure to perform any work required thereby.

(2) Consultant shall indemnify, save, hold harmless and defend the Lexington-Fayette Urban County Government and its elected and appointed officials, employees, agents, volunteers, and successors in interest (hereinafter “LFUCG”) from and against all liability, damages, and losses, including but not limited to, demands, claims, obligations, causes of action, judgments, penalties, fines, liens, costs, expenses, interest, defense costs and reasonable attorney’s fees that are in any way incidental to or connected with, or that arise or are alleged to have arisen, directly or indirectly, from or by Consultant’s performance or breach of the agreement and/or the provision of goods or services provided that: (a) it is attributable to personal injury, bodily injury, sickness, or death, or to injury to or destruction of property (including the loss of use resulting therefrom), or to or from the negligent acts, errors or omissions or willful misconduct of the Consultant; and (b) not caused solely by the active negligence or willful misconduct of LFUCG.

(3) Notwithstanding, the foregoing, with respect to any professional services performed by Consultant hereunder (and to the fullest extent permitted by law), Consultant shall indemnify, save, hold harmless and defend LFUCG from and against any and all liability, damages and losses, including but not limited to, demands, claims, obligations, causes of action, judgments, penalties, fines, liens, costs, expenses, interest, defense costs and reasonable attorney’s fees, for any

damage due to death or injury to any person or injury to any property (including the loss of use resulting therefrom) to the extent arising out of, pertaining to or relating to the negligence, recklessness or willful misconduct of Consultant in the performance of this agreement.

(4) In the event LFUCG is alleged to be liable based upon the above, Consultant shall defend such allegations and shall bear all costs, fees and expenses of such defense, including but not limited to, all reasonable attorneys' fees and expenses, court costs, and expert witness fees and expenses, using attorneys approved in writing by LFUCG, which approval shall not be unreasonably withheld.

(5) These provisions shall in no way be limited by any financial responsibility or insurance requirements, and shall survive the termination of this agreement.

(6) LFUCG is a political subdivision of the Commonwealth of Kentucky. Consultant acknowledges and agrees that LFUCG is unable to provide indemnity or otherwise save, hold harmless, or defend the Consultant in any manner.

### **6.9.3. FINANCIAL RESPONSIBILITY**

The **CONSULTANT** understands and agrees that the **CONSULTANT** shall, prior to final acceptance of the **CONSULTANT'S** proposal and the commencement of any work; demonstrate the ability to assure compliance with the Indemnity Agreement and other provisions of this Agreement.

### **6.9.4. INSURANCE REQUIREMENTS**

#### **6.9.4.1. Required Insurance Coverage**

CONSULTANT shall procure and maintain for the duration of this Agreement the following or equivalent insurance policies at no less than the limits shown below and cause its subcontractors to maintain similar insurance with limits acceptable to OWNER in order to protect OWNER against claims for injuries to persons or damages to property which may arise from or in connection with the performance of the work hereunder by CONSULTANT. The cost of such insurance shall be included in any proposal:

<u>Coverage</u>	<u>Limits</u>
General Liability	\$1 million per

(Insurance Services Office Form CG 00 01)	occurrence, \$2 million aggregate or \$2 million combined single limit
Commercial Automobile Liability (Insurance Services Office Form CA 0001)	combined single, \$1 million per occurrence
Professional Liability	\$1 million per occurrence, \$2 million aggregate
Worker's Compensation	Statutory
Employer's Liability	\$500,000.00

The policies above shall contain the following conditions:

- a. OWNER shall be named as an additional insured in the General Liability Policy and Commercial Automobile Liability Policy.
- b. The General Liability Policy shall be primary to any insurance or self-insurance retained by OWNER.
- c. The General Liability Policy shall include Business Interruption coverage.
- d. The General Liability Policy shall have a Professional Liability endorsement (including Errors and Omissions), which shall include Business interruption coverage and this policy or endorsement shall include Environmental Casualty coverage for any services performed pursuant to the contract, and/or a separate Professional Liability Policy shall be obtained unless it is deemed not to apply by OWNER. (OWNER does not need to be named as additional insured).
- e. OWNER shall be provided at least 30 days advance written notice via certified mail, return receipt requested, in the event any of the required policies are canceled or non-renewed.
- f. The Professional Liability policy shall be maintained for a minimum of three years beyond the completion date of the project, to the extent commercially available. If not commercially available, CONSULTANT shall notify OWNER and obtain similar insurance that is commercially available and acceptable to OWNER.
- g. Said coverage shall be written by insurers acceptable to OWNER and shall be in a form acceptable to OWNER. Insurance placed with insurers with a rating classification of no less than Excellent (A or A-) and a financial size category of no less than VIII, as defined

by the most current Best's Key Rating Guide shall be deemed automatically acceptable.

**6.9.4.2. Renewals**

After insurance has been approved by OWNER, evidence of renewal of an expiring policy must be submitted to OWNER, and may be submitted on a manually signed renewal endorsement form. If the policy or carrier has changed, however, new evidence of coverage must be submitted in accordance with these Insurance Requirements.

**6.9.4.3. Right to Review, Audit and Inspect**

CONSULTANT understands and agrees that OWNER may review, audit and inspect any and all of CONSULTANT'S records and operations to insure compliance with these Insurance Requirements.

**6.9.5. SAFETY AND LOSS CONTROL**

CONSULTANT shall comply with all applicable federal, state, and local safety standards related to the performance of its works or services under this Agreement and take necessary action to protect the life, health and safety and property of all of its personnel on the job site, the public, and OWNER.

**6.9.6. DEFINITION OF DEFAULT**

CONSULTANT understands and agrees that the failure to comply with any of these provisions shall constitute default under this Agreement. CONSULTANT also agrees that OWNER may elect as its option any single remedy or penalty or any combination of remedies and penalties, as available, including but not limited to purchasing insurance and charging CONSULTANT for any such insurance premiums purchased, or suspending or terminating this Agreement.

**SECTION 7 - EQUAL EMPLOYMENT OPPORTUNITY**

During the performance of this Agreement, the CONSULTANT agrees as follows:

- 7.1. The CONSULTANT will not discriminate against any employee or application for employment because of race, color, religion, national origin, sex, age, or handicap. The CONSULTANT will take affirmative action to ensure that applicants are employed, and that employees are treated during employment without regard to their race, color, religion, national origin, sex, age, or handicap. Such action shall include, but not be limited to the following:

employment upgrading, demotion or transfer, recruitment or recruitment advertising, layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeships. The **CONSULTANT** agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided setting forth the provisions of this non-discrimination clause.

- 7.2.1. The **CONSULTANT** will, in all solicitations or advertisements for employees placed by or on behalf of the **CONSULTANT**, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, national origin, sex, age (between forty and seventy), or handicap.

## **SECTION 8 - SPECIAL PROVISIONS, EXHIBITS, AND SCHEDULES**

- 8.1. This Agreement is subject to the following provisions.

- 8.1.1. Pursuant to subparagraph 3.4 of this Agreement, **OWNER** has assigned Dowell Hoskins-Squier, Commissioner of the Department of Environmental Quality & Public Works (the "**OWNER'S** Agent"), as the authorized agent of **OWNER**, to monitor, direct and review the performance of work of the **CONSULTANT**. Documents, data, reports, and all matters associated with carrying out this Agreement shall be addressed to the **OWNER'S** Agent or his designee. Questions by the **CONSULTANT** regarding interpretations of the terms, provisions and requirements under this Agreement shall be addressed to the **OWNER'S** Agent or his designee. The **CONSULTANT** shall look only to the **OWNER'S** Agent or his designee for direction in its performance under this Agreement; no other direction shall be binding upon **OWNER**. **OWNER** shall respond to written requests by **CONSULTANT** within thirty (30) days.

- 8.2. This Agreement, together with the Incorporated Documents (Section 1.2) constitutes the entire Agreement between **OWNER** and **CONSULTANT** and supersedes all prior written or oral understandings. This Agreement and **EXHIBITS A, B, and C** and any related schedules or documents may only be amended, supplemented, modified or canceled by a duly executed written instrument.
- 8.3. **NO THIRD PARTY RIGHTS.** This agreement does not create a contractual relationship with or right of action in favor of a third party against either **OWNER** or **CONSULTANT**.
- 8.4. **UNENFORCEABLE TERMS/SURVIVABILITY.** If any term or provision of this Agreement shall be found to be illegal or unenforceable, this Agreement shall remain in full force and such term or provision shall be deemed stricken. The provisions of Section 6 of this Agreement shall survive its termination.
- 8.5. **NON-WAIVER.** The failure of either party to enforce any right reserved to it in this Agreement shall not be a waiver of any such right to which the party is entitled.

IN WITNESS WHEREOF, the parties hereto have made and executed this Agreement as of the day and year first above written.

OWNER:

CONSULTANT:

LEXINGTON-FAYETTE URBAN  
COUNTY GOVERNMENT

Applied Research Associates, Inc.

BY: *Jim Gray*  
JIM GRAY, MAYOR

BY: *Jennifer Di Gregorio*  
JENNIFER DI GREGORIO

ATTEST:  
*Shirley D. Deputy*  
URBAN COUNTY COUNCIL CLERK  
COMMONWEALTH OF KENTUCKY )  
)  
COUNTY OF FAYETTE )

The foregoing Agreement was subscribed, sworn to and acknowledged before me by Jennifer Di Gregorio, as the duly authorized representative for and on behalf of ARA, on this the 24<sup>th</sup> day of July, 2018.  
My commission expires: 7/28/2020.



OFFICIAL SEAL  
THERESA RHODES  
NOTARY PUBLIC - State of New Mexico

*Theresa Rhodes*  
NOTARY PUBLIC

My Commission Expires 7/28/2020

**EXHIBIT A**

**PROPOSAL OF ENGINEERING SERVICES  
AND RELATED MATTERS**

# **2018 Pavement Management System Update**

Quote

June 6, 2018

Prepared for:  
Chester Hicks  
Administrative Officer  
Department of Environmental Quality & Public Works  
Lexington-Fayette Urban County Government

Prepared by:  
Applied Research Associates, Transportation Sector  
3605 Hartzdale Drive  
Camp Hill, PA 17011

Author: Jacob Walter, P.E.

Reviewer: William Vavrik, Ph.D., P.E.



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## Introduction

Applied Research Associates, Inc. (ARA), assisted by our local partner Abbie Jones Consulting, presents the attached quote to update the pavement management system used by the Lexington-Fayette Urban County Government (LFUCG). In 2015, the ARA project team implemented the initial pavement management system for the Government including software, web-based hosting, a baseline data evaluation, an inventory of historical data, analysis of the baseline data, tailoring of the system to reflect the current business practices of LFUCG, training, and presentation of the results and conclusions of the system to the City Council. Since the implementation of the system, the Government has been actively using the results to plan and optimize their pavement maintenance plans.

While the system seems to currently meet LFUCG's needs, it does require new data for several reasons. First, the system operates under the assumption that similar roads (i.e., local asphalt roads) will behave in the same way throughout the County. Engineers and public works professionals know that this is not necessarily the case; certain streets can deteriorate faster or slower due to both known issues (i.e., unusual traffic levels) and unknown issues (i.e., construction issues). Second, the performance models from the initial implementation are highly dependent on the existing historical data which may be inaccurate. Finally, the system may not represent changes to the LFUCG's business processes that have been made since the last data collection. For all these reasons, asset management system (such as pavement management systems) need to be updated with new condition data on a periodic basis. The following proposal provides an outline of the work plan and deliverables that ARA would provide to update the LFUCG system.

As part of this update, there are several tasks that are required:

- Update the pavement condition for each pavement segment in the LFUCG network.
- Upload work performed since the baseline survey.
- Examine the change between the baseline (2015) condition and the current condition.
- Modify the performance models to incorporate the new data.
- Update the engineering settings (treatment matrix, cost, consequence, etc.) to match the current and/or desired business processes at LFUCG (i.e., new treatment types, revised costs)
- Perform a network-level analysis of pavement condition and present the results to the City Council.

Each of these items requires a specific deliverable provided either to LFUCG or uploaded to the LFUCG pavement management system maintained by ARA. These deliverables are described at the end of each element of the proposed work plan presented below.

## Work Plan

To meet the goals listed in the Introduction will require a work plan that develops deliverables that will meet one or more needs. This section describes ARA's approach to the system update and which tasks will be required to deliver specific deliverables. This approach may be modified as the project progresses to meet scheduling and unknown technical goals.

## Management

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A key step in any successful project is the active management of that project. As in the initial implementation, Mr. Jacob Walter will serve as Project Manager for this effort. In the management role, his principal duty will be serving as the single point of contact between the LFUCG and the project team. This does not mean the LFUCG will have no contact with the other team members though; team members will work directly with LFUCG staff as needed to assemble the deliverables required for this project. However, Mr. Walter will be involved in these conversations to address issues that a specific team member may not be aware of as they work with the LFUCG. Using a single point of contact has been a successful method for frequent, accurate communication between the project team and the client in many of our previous efforts.

The second element of management is tracking. Mr. Walter will also be responsible for this but will be assisted by various members of the team as needed. Tracking consists of two parts. First, it answers the question "How close is the team to meeting a specific milestone?" In some tasks, this may be measured quantitatively (e.g., number of mile surveyed) while others will require a more qualitative approach (e.g., expected time to complete the GIS integration). All tasks will be tracked by the project manager. A bi-weekly status update will be provided by email.

Quality management, another key element in this phase of the project, will be overseen by the Project Manager while being an integral part of each of the tasks in the project approach. The quality management plan is based on existing processes that ARA has developed over the past fifteen years of data collection activities (of which ten of those years involved collection of data through digital means) and system implementation experience.

## Kickoff

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Our efforts to ensure frequent and effective communication begin at the start of the project. At this time, the ARA project manager, an ARA Vice President, and the City stakeholders will meet on-site to determine a final implementation plan, schedule (including tasks, start and end dates, milestones, and deliverables), and desired results for the project.

In parallel to the setup and kickoff tasks required of the project manager, ARA will also perform the tasks necessary to prepare our field crews for work in Lexington. This includes basics such as scheduling and travel planning but also includes the development of a new routing plan for the DSV. ARA will start with the 2015 routing plan, use the 2018 GIS data that we already have, and then generate the new routing.

**Deliverables:** Meeting notes from kickoff, kickoff presentation (if developed), routing plan.

## Field Testing

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In a system update, the most critical element is to maintain consistency with the work previously performed. However, this does not mean that we can only use the same tools and processes

that were used previously. For 2018, ARA will use its Laser Crack Measurement System (LCMS) based Digital Survey Vehicle (DSV) to perform the surveys, and example of which is shown in Figure 1. While many of the elements on this equipment are the same as the equipment used during the baseline survey, there are significant differences:

- The road profile system is the same and still conforms to ASTM E950. Each pavement segment will have an International Roughness Index (IRI) calculated in units of inches per mile. This ride quality measurement is a key indicator of vertical displacement issues and is also one of the major conditions that road patrons notice about their roads.
- The location system is the same and is based on the Global Positioning System (GPS) supplemented with an Inertial Navigation System (INS). A second, independent system measures distance traveled. Both distance and specific location (latitude, longitude, and elevation) are tagged to all data collected by the DSV.
- The multi-camera right-of-way imaging system has been replaced with a single 360-degree camera mounted on a mast above the DSV. ARA can extract specific images (such as a forward image) using software provided with the camera. This helps our users keep their existing videolog systems and image viewing software although the full 360-degree image can be provided if useful.
- The downward imaging system has been replaced with a three-dimensional laser scanner that measures both depth and pavement reflectivity. This system can either be used:
  - Directly in a human-controlled survey as ARA did for the baseline in 2015.
  - As the basis for an automated survey using the data and computer algorithms to produce the initial survey which is then reviewed by engineering technicians.
- Rutting is measured based on the laser scans instead of through the bumper-mounted lasers. This produces a far more detailed and accurate transverse profile.



**Figure 1. LCMS-based DSV with 360-degree ROW camera.**

As in the 2015 baseline survey, the DSV will survey in a single direction for two lane roads (1 survey mile per centerline mile) while surveying once in each travel direction for wider roads (2 survey miles per centerline mile). ARA will continue to use the direct, human-controlled survey technique for its evaluation efforts to maintain the consistency with the existing data. However,

that effort will be supplemented with data from the LCMS for both quality control and accuracy purposes. ARA will extract the forward, right-forward side, and left-rear side images from the right-of-way camera.

Ride quality (IRI) will continue to be measured from the front bumper while Mean Texture Depth (MTD), used in the previous survey to determine the weathering and raveling in the pavement, will be measured from the LCMS. Additionally, raveling measurements will be taken using the LCMS methodologies included with the sensor; these will be compared with the MTD measurements and then the project team (LFUCG and ARA) will decide which to use.

To ensure good quality data, ARA will collect data based on these requirements:

- Start data collection an hour after sunrise
- Stop data collection an hour before sunset
- Clear and dry pavements

All of the testing performed will be done with the safety of both employees (LFUCG and ARA) and patrons in mind. If our operators feel that data collection is unsafe due to roadway conditions (short lanes, heavy traffic, etc.) they will attempt to return at a later time when conditions have improved. There may be some limited locations where it is not possible to collect data due to safety concerns, although these occur very infrequently for municipal customers.

**Deliverables:** Longitudinal profile data, IRI calculation, pavement sensor data (processed in the next step), and right-of-way image library.

## Processing & Evaluation

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### Data Extraction

Unlike a standard DSV, the LCMS system does require processing between the field and the office to extract certain items:

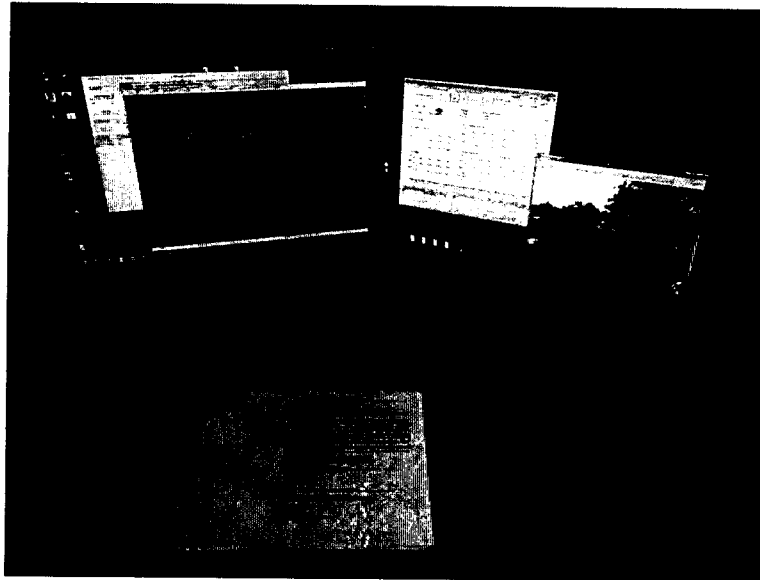
- Downward images
  - Reflective (standard) images
  - Depth images
  - Automated distress identification
- LCMS sensor data
  - Rutting
  - Raveling
  - MTD

In the first step of this process, ARA technicians will process the LCMS data to obtain this data and upload it to the evaluation workstations. They will also fine-tune the extraction of images from the ROW camera.

### Pavement Evaluation

As data extraction is completed for each survey run, the images and any automated data used in the evaluation of those images will be uploaded to a pavement evaluation workstation such as the one shown in Figure 2. ARA staff will evaluate the pavement using ASTM D6433 based on a 50% evaluation methodology using the frame sampling method. This method evaluates every other 20 foot by 14 foot image as opposed to working with contiguous samples and is the same

methodology used in the 2015 survey. Once the initial survey of a given pavement area (i.e., segment) is complete, a separate technician will perform quality control checks on 20% of surveyed data in accordance with ARA's standard quality control procedures. If systematic issues are discovered, the entire pavement area will be resurveyed. Quality control will be done in parallel to the evaluation work to ensure a minimum number of systematic fixes need to be applied to the data within this project.



**Figure 2. Example of a pavement evaluation workstation.**

The result of this process will be a list of distresses in each surveyed pavement frame. Those pavement frames will be then be summarized by pavement segment with the distress list summarized on a segment basis. The other sensor data (rutting, raveling, MTD, and IRI) will also be summarized on the same basis at this point.

### **Curb and Gutter Inventory**

In addition to pavement, ARA will also do an inventory of curb and gutter throughout the survey area to indicate if a segment has curb and gutter and, if so, perform a simple evaluation of the condition of that curb and gutter. This data will be stored in a pair of attributes collected along with the pavement distress: one attribute for the left side curb and gutter and one for the right-side curb and gutter. It will be collected at intervals of 40 feet to match the pavement evaluation sampling rate. Segments with a maintenance attribute of "C County" in the LFUCG GIS will not be included as they should not have curb and gutter.

The possible values for the curb and gutter condition attributes are:

- None – No curb or gutter exists within the pavement segment.
- Good – The curb is complete with no missing material. If any cracking exists, it is barely visible from the DSV images. The gutter is complete with no missing material. There are no impediments to the curb and gutter performing its function: draining water from the street surface.
- Fair – The curb and/or gutter has cracking readily visible from the DSV image. Joints may need to be sealed. Some material may be missing, but the overall the function of

the curb and/or gutter is not affected. There may be debris in the gutter that needs to be removed (vegetation, dirt, etc.).

- Poor – The curb and/or gutter exhibits high levels of distress. The system no longer is capable of performing its function at peak flow due to cracking and missing materials.

**Deliverables:** List of pavement conditions and specific distresses by pavement management segment. Evaluation of each segment's curb and gutter system at 40 foot intervals.

### Data Upload & Consistency Check

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At the conclusion of the evaluation phase of the project, ARA will upload the data into a test copy of the RoadCare database made available via a virtual machine to the LFUCG. This process is fairly automated but is also covered by standard ARA quality control processes. After the data is uploaded, the internal routines in RoadCare will calculate the PCI for each defined pavement segment. At this point, the project team can start running comparisons to the 2015 data. These checks include expected decay checks for PCI (we expect a standard decrease of about 2 points per year based on the pavement family and existing pavement performance model), IRI (the readings are expected to be similar), raveling, and MTD.

ARA will summarize and visualize this data for use by the LFUCG and quality control purposes. Upon completion of this phase of the quality control process, ARA will move the data to the production version of the LFUCG pavement management system.

**Deliverables:** Test and final RoadCare systems, analysis of the current data relative to the 2015 baseline data.

### Pavement Management Update

---

The final step in the process is to update the pavement management system based on new data and any insights from the kickoff or data collection phases of the project. The management side of the update concerns itself with the prediction of future conditions, updates to the RoadCare treatment matrix, and generation of Capital Improvement Plan (CIP) scenarios. The update of the pavement management functions will be performed by experienced ARA pavement engineers assisted by Abbie Jones Consulting staff for a local perspective on the project. Just as data requires quality control to ensure accurate results, the management parameters require expertise to modify the entries so that are appropriate to LFUCG. Without accuracy in both of these factors, any CIPs generated by the system will also be inaccurate.

There are several items, referred to earlier in this work plan, that require updating:

#### Work History

ARA will upload any missing work history data into RoadCare as provided by LFUCG staff. This work history data will assist in the consistency checks as well as the revision of the performance models.

#### Performance Models

ARA will work on refining the pavement performance model with the new data and consistency results from earlier in the project. This may include actions such as increasing the total life span of the pavement or changing the general shape of the model to better reflect the expected OCI values given known last construction, current PCI levels, and current IRI measurements.



### Modification of the Treatment Matrix

The treatment matrix in RoadCare provides three critical pieces of information to the planning module of the software.

- Feasibility – Defines the circumstances where a rehabilitation treatment can be applied. For example, the “AC Reconstruction” treatment may only be applied when the Overall Condition Index is less than 30.
- Cost – Tells the simulation engine how to calculate the cost for a specific treatment. It can be as simple as a unit cost (pavement area \* \$2/ft<sup>2</sup>) or something more complicated.
- Consequence – Defines what happens to a segment’s attributes (i.e., pavement type or PCI) once a treatment is applied.

Each of these items can be defined multiple times for a specific treatment. A common example is the change in unit cost for an AC Overlay based on its functional classification (due to additional required thickness, for example).

As a part of the review each of these elements must be reviewed. Obviously, cost is the most likely to change of these three elements however checking all elements is a required part of the update. Costs will be checked against any cost data LFUCG is willing to provide. The other elements will be reviewed through interviews with LFUCG staff.

In addition to reviewing each treatment element, the update team will also answer the following questions:

- Is each overall strategy (i.e., AC Reconstruction) still being used by the LFUCG in its standard pavement maintenance practices? If a specific approach is not being used, it should be removed from the system or disabled.
- Are there new pavement rehabilitation approaches the LFUCG should take? If so, these need to be added to the treatment matrix.

### Budgets

The available funding for pavement rehabilitation is typically the limiting factor in any scenario. This is one area that, based on our support for the RoadCare software, ARA knows has been actively updated by LFUCG staff. ARA will review the budget settings to ensure that they are still appropriate to LFUCG needs.

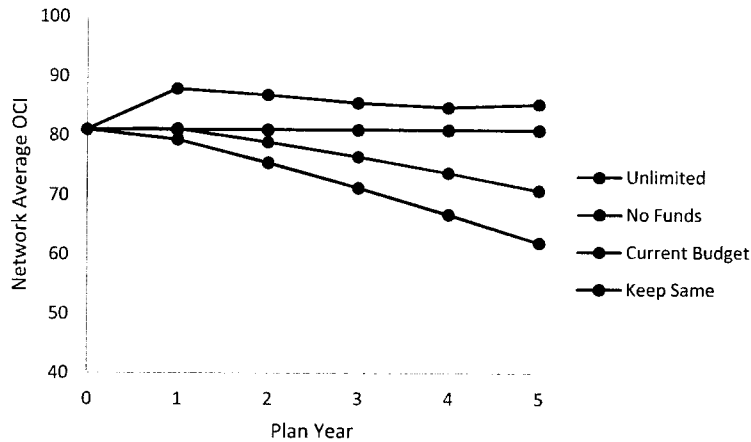
### Scenario Generation

Once the engineering parameters have been updated based on interviews with LFUCG staff and the new data, the ARA team will generate a set of scenarios for quality control. These will include the “No Funding” and “Unlimited Funding” scenarios to ensure the models and treatment matrix are working properly. We will then work with LFUCG staff to create a series of scenarios that are appropriate to the agency’s needs. As a reminder, these scenario’s will be based on a specific limit:

- Budget – Apply rehabilitation projects until the budget is expended. Work should be done optimally across the entire County OR divided between the council districts.
- Desired Condition – Apply rehabilitation projects until a specific average condition level is reached.

- Deficiency Level – Apply rehabilitation projects until all segments are above a specific condition.

At the conclusion of the scenario analysis, the ARA team will present visualizations of the relative results of the various scenarios such as the expected OCI level shown in Figure 3.



**Figure 3. Example of a comparison of scenarios using average network conditions.**

**Deliverables:** Example scenario runs loaded into the production RoadCare database, report discussing the relative results of the scenarios, revised engineering parameters, work history between 2015 and 2018 if not already entered into the system.

## Training

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At the LFUCG's option, ARA will provide a two day, classroom-style, hands-on course on the use and administration of the pavement management system. This course will include teaching by two ARA staff and the materials required for that training such as user manuals and presentations tailored to the LFUCG.

## Presentation

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ARA will provide an on-site presentation to the LFUCG staff (as selected by the Government's project manager) covering the results of the pavement management system, the successes and issues encountered over the past three years since the implementation, and the current condition of the pavements maintained by the LFUCG.

### Key Personnel

While we do not present the qualifications of ARA as a whole in this quote, we do feel the need to ensure the LFUCG that they are receiving the appropriate staff for the job. ARA plans to use the same project manager that implemented the system, Mr. Jacob Walter for the update. Also, oversight and technical expertise will be provided by Dr. Bill Vavrik. Brief biographies are provided below for each of these staff.

#### Jacob Walter, P.E. – Project Manager

Mr. Walter will reprise his role as project manager for this update. He will be responsible for overseeing progress on this project and will be involved in the details of each phase. This oversight will include maintenance of the project schedule once one has been agreed upon by LFUCG and the project team. It will also include bi-weekly status reports provided via email. Mr. Walter will also oversee the implementation of the training program which will start upon project kickoff and continue through the support phase of the project. Finally, Mr. Walter will assist LFUCG personnel in the required presentation to the City Council although Dr. Vavrik will present.

Mr. Walter has nearly twenty years of experience implementing and maintaining asset management systems using a wide variety of tools and data collection procedures. His experience includes both performing and managing data collection, implementing and supporting software systems, developing data collection systems, and analyzing data for engineering departments (e.g., current condition analysis, repair strategy development, and long-term capital improvement planning). His project management experience includes the implementation and updating of pavement management systems for dozens of agencies including project manager roles for Metro Nashville, Waynesboro, Virginia, Arlington, Texas, and Lee County, Florida.

#### William Vavrik, Ph.D., P.E. – Engineering

Dr. Vavrik is a Vice President and Principal Engineer in the Transportation Infrastructure Division of Applied Research Associates, Inc. He joined ARA in 2000 and is responsible for overseeing the execution of hundreds of consulting and research projects in transportation engineering. Dr. Vavrik has a Ph.D. in Civil Engineering from the University of Illinois at Urbana-Champaign and is a registered professional engineer. For this project, Dr. Vavrik will be using his extensive experience in pavement design, pavement management, and engineering software design to assist the LFUCG in the updating of the engineering parameters in RoadCare and finding new methods for pavement rehabilitation that may be appropriate for the Lexington area. He will also use his 20 years of experience in training and presenting technical material to work with the team on the training phase which includes presentation of the results to the LFUCG Council.

**Costs**

Total compensation to ARA for service shall be **\$328,714.66** per the tasks below. ARA will invoice each task on a percent complete basis. This represents a cost based on a compressed schedule as requested by the Government and discussed in the next section.

**Table 1. Project costs by task.**

Task No.	Task Name	Budgeted Hours			Unit Cost	Quantity	Units	Total Cost	Budgeted DBE Cost
		ARA	Signature Staffing	Abbie Jones					
1	Management & Kickoff	80		8	\$ 18,600.00	EA	1	\$ 18,600.00	\$ 680.00
2	Records Review	16			\$ 1,000.00	EA	1	\$ 1,000.00	\$ -
3	Data Collection	674		312	\$ 98.06	per mile	1,260	\$ 123,558.86	\$ 13,440.00
4	Condition Evaluation	1,472	512		\$ 99.88	per mile	1,260	\$ 125,851.89	\$ 10,835.97
5	Data Upload	80			\$ 13,600.00	EA	1	\$ 13,600.00	\$ -
6	Curb Survey	133	54		\$ 10.73	per mile	1,072	\$ 11,503.91	\$ 1,152.40
7	Implementation	40		8	\$ 9,200.00	EA	1	\$ 9,200.00	\$ 680.00
8	Training	64			\$ 15,900.00	EA	1	\$ 15,900.00	\$ -
9	Presentation	24		16	\$ 9,500.00	EA	1	\$ 9,500.00	\$ 1,360.00
<b>TOTAL</b>		<b>2,583</b>	<b>566</b>	<b>344</b>			<b>TOTAL</b>	<b>\$ 328,714.66</b>	<b>\$ 28,148.36</b>
								Budgeted DBE Percentage	8.6%

In Task 3, Data Collection, ARA intends to use a single digital survey vehicle to collect data. ARA intends that the driver of the vehicle will be provided by our DBE subconsultant. In the case that the Abbie Jones Consulting (DBE Subconsultant) is not able to provide a driver, ARA will provide a driver with no cost impact to this work effort. However, the DBE percentage achieved will be less than is budgeted. LFUCG understands and approves of ARA's reduction in DBE percentage if the DBE subconsultant is not able to provide the required staffing during the project execution.

In Task 4, Condition Evaluation, ARA plans to use a local WBE staffing firm, Signature Staffing, to supplement our staff to meet LFUCG's schedule needs (see the next section). This amount is an estimate of required hours by the supplemental staff; it may vary. Also, this assumes that Signature Staffing is approved as a DBE by the City of Lexington. If either of these items vary, the DBE percentage will vary as well. LFUCG approves of this variation in the DBE percentage.

Schedule

Per the Government's request, ARA presents the attached schedule to provide data to the LFUCG by October 5, 2018. After this date there will still be some implementation tasks to perform, but RoadCare will be able to perform initial analysis on the improvement needs throughout the agency. This compressed work schedule is shown in the Figure 4, assuming a notice to proceed of July 16, 2018. This schedule may need to be adjusted for issues out of ARA's control.

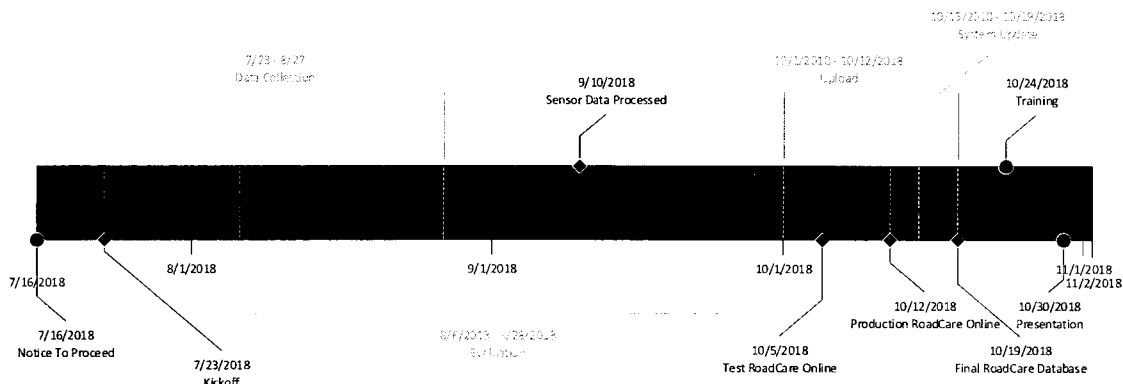


Figure 4. Proposed schedule, compressed.

**EXHIBIT C**

**FURTHER DESCRIPTION OF BASIC  
ENGINEERING SERVICES AND  
RELATED MATTERS**

Last Name	First Name	Job Title	Contract Pay Rate
Aho	Brian	Senior Civil Engineer 2	\$144.66
Amenta	James	Princ. Civil Engineer 1	\$219.50
Anand	Pritha	Staff Civil Engineer 1	\$91.31
Ashtiani	Ali	Senior Civil Engineer 1	\$155.25
Baer	Seth	Staff Civil Eng. Tech. 1	\$58.25
Beckemeyer	Curt	Senior Principal SME	\$307.28
Becker	Chadwick	Senior Software Dev. 2	\$133.00
Becker	Rachel	Staff Engineer 2	\$91.00
Bennett	Jacob	Senior Civil Eng. Tech. 1	\$66.65
Bhardwaj	Saransh	Staff Software Engineer 2	\$114.44
Bittner	Jason	Prin. Subj. Matter Exp. 1	\$252.62
Bledsoe	James	Princ. Civil Engineer 1	\$192.05
Borgaonkar	Amruta	Staff Software Engineer 2	\$111.09
Brink	Wouter	Staff Civil Engineer 2	\$112.61
Byrne	Richard	Prin. Systems Engineer 1	\$197.83
Call	Brian	Staff Civil Eng. Tech. 1	\$48.70
Camp	Justin	Staff Civil Eng. Tech. 1	\$49.91
Chesnik	Kevin	Prin. Civil Engineer 2	\$273.92
Church	Hobert	Junior Civil Eng. Tech. 2	\$45.05
Dalbey	Paul	Senior Civil Engineer 1	\$119.61
Damaraju	Suvansh	Junior Software Engineer	\$99.56
D'Angelo	Daniel	Prin. Civil Engineer 2	\$252.62
Darter	Michael	Prin. Civil Engineer 2	\$251.10
Davis	Jefferson	Staff Software Engineer 2	\$97.39
Daws	Tyler	Staff Civil Eng. Tech. 1	\$50.22
DeMay	Kimberly	Senior Civil Eng. Tech. 1	\$80.35
Denis	Martina	Senior Software Eng. 1	\$158.27
Desaraju	Praveen	Princ. Civil Engineer 1	\$182.74
DiMaggio	Jerome	Prin. Civil Engineer 2	\$290.66
Dormohammadi	Aliasghar	Staff Civil Engineer 1	\$100.77
Dunfee	Aaron	Staff Civil Eng. Tech. 1	\$48.70
Dwyer	Carmine	Senior Civil Engineer 2	\$132.40

Last Name	First Name	Job Title	Contract Pay Rate
Eckrich	Kristi	Senior Civil Eng. Tech. 1	\$78.52
Eshleman	Michael	Senior Civil Eng. Tech. 2	\$83.70
Figuroa	Hector	Senior Civil Engineer 2	\$134.16
Foster	Barbara	Administrative Asst 2	\$49.00
Gancarz	Daniel	Senior Civil Engineer 1	\$118.70
Gerke	John	Junior Engineer	\$88.39
Giwa-Agbomeirele	Okoineme	Senior Engineer 2	\$193.66
Goodin	David	Senior Civil Eng. Tech. 2	\$96.09
Gorman	Russ	Senior Software Eng. 2	\$219.50
Gotlif	Alexander	Senior Civil Engineer 1	\$135.44
Guy	Samuel	Senior Electrical Eng. 1	\$157.51
Hagan	Justin	Junior Civil Eng. Tech. 2	\$44.74
Hall	Cody	Staff Civil Eng. Tech. 1	\$48.70
Harm	Eric	Princ. Civil Engineer 1	\$184.14
Harrell	Michael	Princ. Civil Engineer 1	\$182.62
Harvey	Nicklas	Staff Civil Eng. Tech. 1	\$57.86
Hawkes	Leroy	Staff Electronic Tech. 2	\$70.55
Heckel	Laura	Senior Civil Engineer 1	\$123.27
Holley	Grady	Senior Civil Eng. Tech. 2	\$99.07
Hutchison	Michael	Principal Program Mgr 1	\$244.95
Islam	Md Shahidul	Staff Civil Engineer 2	\$107.13
Jones	Robin	Executive Administrator	\$114.50
Karlinsky	Nadia	Staff Software Engineer 2	\$97.39
Kazmee	Hasan	Staff Civil Engineer 1	\$116.93
Kennedy	Naoko	Senior Civil Eng. Tech. 2	\$52.96
Knieriem	Russell	Junior Civil Engineer	\$87.20
Kocher	Benjamin	Junior Civil Eng. Tech. 2	\$50.22
Larson	Gregg	Princ. Civil Engineer 1	\$192.35
Lechner	Julie	Staff Office Admin.	\$72.13
Lee	Hyung	Senior Civil Engineer 1	\$124.79
Lewis	Andrew	Senior Electronic Tech. 1	\$70.92
Lowe	Corey	Staff Electronic Tech. 2	\$66.20
Lupo	Vincent	Senior Software Eng. 1	\$152.18
Mannan	Amina	Staff Civil Engineer 1	\$80.66
Miller	Maria	Staff Civil Engineer 2	\$102.96



Last Name	First Name	Job Title	Contract Pay Rate
Mouradyan	Alis	Staff Civil Engineer 2	\$124.00
Mundo	William	Staff Civil Eng. Tech. 1	\$56.00
Mundra	Shobhit	Junior Software Engineer	\$81.57
Muraoka	Kazuhiko	Senior Syst. Dev. Spec. 1	\$132.40
Murphy	Michael	Senior Civil Eng. Tech. 1	\$105.37
Murrell	Scott	Prin. Civil Engineer 2	\$290.69
Mustafa	Endri	Senior Civil Engineer 1	\$121.20
Nabizadeh	Hadi	Staff Civil Engineer 1	\$100.44
Neunaber	Brendan	Staff Software Engineer 1	\$84.31
Newman	Chris	Senior Civil Eng. Tech. 1	\$80.50
Norman	Adair	Senior Civil Eng. Tech. 2	\$102.33
Offei	Edward	Staff Civil Engineer 2	\$83.70
Oti	Isaac	Staff Civil Engineer 1	\$80.66
Papantoniou	Alexandra	Subject Matter Expert	\$187.00
Parsons	Timothy	Princ. Civil Engineer 1	\$182.74
Patz	Daniel	Junior Civil Engineer	\$77.03
Payne	Michael	Staff Civil Eng. Tech. 2	\$60.84
Phillips	Dewey	Staff Software Engineer 2	\$163.71
Phillips	Pam	Prin. Subj. Matter Exp. 2	\$238.83
Pollitt	James	Staff Network Admin. 1	\$106.43
Premkumar	Laxmikanth	Senior Civil Engineer 1	\$117.18
Ptak	Mark	Staff Civil Engineer 2	\$90.18
Purcell	Harold	Staff Prog/Analyst 2	\$149.99
Puzin	Tara	Senior Civil Engineer 1	\$130.60
Ramachandran	Aditya	Staff Civil Engineer 2	\$111.85
Rao	Shreenath	Princ. Civil Engineer 1	\$194.79
Ravikumar	Shrivatsa	Staff Civil Engineer 1	\$91.00
Ray	Patrick	Staff Mechanical Tech. 2	\$63.06
Reiter	Joseph	Senior Civil Engineer 1	\$108.66
Rescot	Robert	Senior Civil Engineer 1	\$132.70
Ricalde	Lia	Senior Civil Engineer 1	\$184.50
Robinett	Amy	Senior GIS/GPS Analyst 2	\$130.57

Last Name	First Name	Job Title	Contract Pay Rate
Rohrer	Paul	Senior Civil Eng. Tech. 1	\$73.96
Rummler	William	Staff Software Engineer 2	\$125.09
Sabahfar	Nassim	Staff Civil Engineer 1	\$122.90
Safaei	Farinaz	Staff Civil Engineer 1	\$125.64
Safavizadeh	Seyed Amirshayan	Staff Civil Engineer 1	\$134.34
Sebright	Joseph	Junior Software Engineer	\$76.09
Seher	Chris	Prin. Subj. Matter Exp. 2	\$286.31
Selezneva	Olga	Princ. Civil Engineer 1	\$181.98
Shirazi	Ehsan	Staff Software Engineer 2	\$114.23
Shirazi	Hamid	Princ. Civil Engineer 1	\$173.48
Shirazi	Shahabaldin	Staff Civil Engineer 1	\$93.59
Sims	Stephen	Staff Civil Eng. Tech. 1	\$49.76
Speir	Richard	Engineering Director	\$271.49
Spencer	Ryan	Staff Prog/Analyst 1	\$146.09
Stanley	Mark	Senior Civil Engineer 1	\$111.09
Steele	Douglas	Senior Civil Engineer 2	\$136.05
Steele-Riffo	Lenny	Junior Civil Eng. Tech. 1	\$46.26
Stefanski	Joseph	Senior Civil Engineer 1	\$132.70
Suwal	Roshan	Staff Civil Engineer 1	\$87.35
Tayabji	Shiraz	Prin. Civil Engineer 2	\$283.05
Thompson	Graham	Principal Engineer 2	\$311.97
Thompson	Sandra	Senior Prog Cont Analyst	\$117.09
Tomlinson	Christopher	Staff Civil Engineer 1	\$103.63
Trent Baraka	Maryka	Senior Proposal Analyst	\$109.20
Turner	Joshua	Lead Technician	\$85.62
Vavrik	William	Engineering Director	\$259.47
Von Quintus	Harold	Prin. Civil Engineer 2	\$254.14
Waldrup	Holly	Staff Civil Eng. Tech. 1	\$57.22
Walter	Jacob	Senior Civil Engineer 2	\$158.27
Wang	Chieh	Staff Civil Engineer 1	\$96.48
White	James	Princ. Civil Engineer 1	\$240.60
Wilhoit	Torry	Junior Software Engineer	\$76.09

Last Name	First Name	Job Title	Contract Pay Rate
Wilke	Paul	Princ. Civil Engineer 1	\$201.49
Wilson	Thomas	Senior Civil Engineer 2	\$153.09
Wolf	Dean	Field Svcs Mgr	\$144.48
Zhang	Yanbin	Staff Software Engineer 2	\$95.26

Equipment	Units	Unit Rate	Notes
Standard ARA Van/Car	mile	\$0.80	
Digital Survey Vehicle	day	\$1,770.00	Daily charge applies only when surveying. Mileage charge applied during both survey and mobilization
	mile	\$2.00	
Falling Weight Deflectometer	day	\$1,580.00	Daily charge applies only when surveying. Mileage charge applied during both survey and mobilization
	mile	\$1.40	
SurPRO Rolling Inclinator	day	\$660.00	Daily charge applies only when surveying. Mileage charge applied during mobilization
Sound, Texture, & Profile	day	\$1,580.00	
	mile	\$0.80	
Rolling Wheel Deflectometer	day	\$3,940.00	
Friction Tester	day	\$2,500.00	Daily charge applies only when surveying. Mileage charge applied during both survey and mobilization
	mile	\$1.00	
Retro Reflectometer, handheld	day	\$660.00	



APPLIED RESEARCH ASSOCIATES, INC.

██████████  
████████████████████  
Department of Environmental Quality and Public Works  
Lexington-Fayette Urban County Government  
200 E. Main St., Suite 936  
██████████

Subject:       **Modification ██████ to 2018 Pavement Management Update**

Dear ████████████████████:

Applied Research Associates (ARA), Inc. appreciates the opportunity to submit to the attached proposed modification to the 2018 Pavement Management Update.

████████████████████  
Please indicate your acceptance of this agreement by signing Section 6 upon agreement with the enclosed scope of work and approval by all necessary LFUCG authorities. If you have any questions or need additional information, please do not hesitate to contact the ARA Project Manager, Jacob Walter at (717) 975-3550 or [jwalter@ara.com](mailto:jwalter@ara.com).

Sincerely,

Jacob Walter, P.E.  
Senior Engineer, Transportation



**1 PROJECT UNDERSTANDING**

**2 SCOPE OF SERVICES**

**2.1 TASK 1**

**2.2 TASK 2**

**2.3 TASK 3**

**3 PROJECT SCHEDULE**

**4 DELIVERABLES**

ARA will provide the following deliverables:

Deliverable	Due Date
	Can be calendar date or relative to other events

**5 PROJECT PRICE**

ARA will provide the services noted in this proposal based on the rate table provided in Exhibit C of the contract. This modification shall add \$[redacted] to the original contract. The details of this cost are provided below:

Staff/Equipment	Quantity	Cost

ARA will invoice monthly on a percent complete basis for payment to be made within 30 days of receipt of invoice (Net 30).



**6 ACCEPTANCE OF PROPOSAL**

Your signature below indicates your acceptance of this proposal in accordance with the scope, price, schedule, and the terms and conditions contained herein, and will create a binding agreement between you and ARA. This acceptance will act as a notice to proceed.

Acceptance and Authorization
Name (print)
Title
Signature:
Date: