



The following documentation is an electronically-submitted vendor response to an advertised solicitation from the *West Virginia Purchasing Bulletin* within the Vendor Self-Service portal at *wvOASIS.gov*. As part of the State of West Virginia's procurement process, and to maintain the transparency of the bid-opening process, this documentation submitted online is publicly posted by the West Virginia Purchasing Division at *WVPurchasing.gov* with any other vendor responses to this solicitation submitted to the Purchasing Division in hard copy format.

Header 1


[List View](#)**General Information** | [Contact](#) | [Default Values](#) | [Discount](#) | [Document Information](#) | [Clarification Request](#)

Procurement Folder: 854648

SO Doc Code: CRFQ

Procurement Type: Central Master Agreement

SO Dept: 0803

Vendor ID: VS0000022162 

SO Doc ID: DOT2100000137

Legal Name: APPLIED RESEARCH ASSOCIATES INC


Published Date: 4/20/21

Alias/DBA:

Close Date: 5/11/21

Total Bid: \$455,100.00

Close Time: 13:30

Response Date: 05/10/2021 

Status: Closed

Response Time: 18:13

Solicitation Description: MOBILE RETROREFLECTIVITY TETING FOR PAVEMENT  Responded By User ID: jmitchaner 

Total of Header Attachments: 1

Total of All Attachments: 1

First Name: Jennifer

Last Name: Mitchaner

Email: jmitchaner@ara.com

Phone: 217-356-4500



Department of Administration
 Purchasing Division
 2019 Washington Street East
 Post Office Box 50130
 Charleston, WV 25305-0130

**State of West Virginia
 Solicitation Response**

Proc Folder: 854648
Solicitation Description: MOBILE RETROREFELCTIVITY TETING FOR PAVEMENT MARKINGS
Proc Type: Central Master Agreement

Solicitation Closes	Solicitation Response	Version
2021-05-11 13:30	SR 0803 ESR05102100000007554	1

VENDOR
 VS0000022162
 APPLIED RESEARCH ASSOCIATES INC

Solicitation Number: CRFQ 0803 DOT2100000137
Total Bid: 455100
Response Date: 2021-05-10
Response Time: 18:13:02
Comments:

FOR INFORMATION CONTACT THE BUYER
 John W Estep
 304-558-2566
 john.w.estep@wv.gov

Vendor Signature X **FEIN#** **DATE**

All offers subject to all terms and conditions contained in this solicitation

Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Ln Total Or Contract Amount
1	MOBILE RETROREFLECTIVITY TESTING FOR PAVEMENT MARKINGS	1.00000	EA	455100.000000	455100.00

Comm Code	Manufacturer	Specification	Model #
78141600			

Commodity Line Comments:

Extended Description:

MOBILE RETROREFLECTIVITY TESTING FOR PAVEMENT MARKINGS



May 7, 2021

State of West Virginia
Department of Administration
Purchasing Division
2019 Washington Street, East
Charleston, West Virginia 25305-0130

Subject: **CRFQ: DOT2100000137**
“Mobile Retroreflectivity Testing Pavement Markings”

To Whom It May Concern,

Applied Research Associates, Inc. (ARA) is pleased to submit this quote to the West Virginia Department of Transportation, Division of Highways (DOH) for the state-wide collection of pavement marking retroreflectivity data. ARA staff are nationally recognized experts in pavement markings, and we have over 20 years of experience in mobile data collection. Ms. Carmine Dwyer will serve as the Contract Manager/Project Manager, and Mr. Shrivatsa Ravikumar will serve as the Deputy Project Manager. Their resumes and the resumes of our two lead technicians are attached to this letter. The mobile retroreflectometer unit that ARA intends to use for this data collection is the Laserlux G7 (LLG7). ARA, our staff, and our equipment meet or exceed all of the qualification requirements stated in the mobile retroreflectivity testing specifications.

We look forward to the opportunity to work with the West Virginia DOH again. If you require any additional information or clarifications, please do not hesitate to contact us.

Sincerely,

William R. Vavrik, Ph.D., P.E.
Vice President & Principal Engineer

EXHIBIT A - PRICING PAGES

Quantities listed are approximations only, based on estimates supplied by the Agency. It is understood and agreed that the Contract shall cover the quantities actually performed and measured during the term of the Contract as defined in the Contract Specifications, whether more or less than the quantities shown.

ITEM NUMBER	ESTIMATED QUANTITY	DESCRIPTION	UNIT COST	EXTENDED TOTAL AMOUNT (QTY x UNIT COST)
1	6,000	Pavement Marking Mobile Retro Testing-Expressway, Line Miles	\$21.05	\$126,300
2	13,200	Pavement Marking Mobile Retro Testing-Secondary, Line Miles	\$24.00	\$316,800
3	3	Mobilization, Per Release Order, Each	\$4,000	\$12,000



Department of Administration
 Purchasing Division
 2019 Washington Street East
 Post Office Box 50130
 Charleston, WV 25305-0130

State of West Virginia
 Centralized Request for Quote
 Highways

Proc Folder: 854648			Reason for Modification:
Doc Description: MOBILE RETROREFLECTIVITY TETING FOR PAVEMENT MARKINGS			
Proc Type: Central Master Agreement			
Date Issued	Solicitation Closes	Solicitation No	Version
2021-04-20	2021-05-11 13:30	CRFQ 0803 DOT2100000137	1

BID RECEIVING LOCATION


BID CLERK
 DEPARTMENT OF ADMINISTRATION
 PURCHASING DIVISION
 2019 WASHINGTON ST E
 CHARLESTON WV 25305
 US

VENDOR

Vendor Customer Code: VS0000022162
Vendor Name : Applied Research Associates, Inc.
Address : 100 Trade Centre Dr., Suite 200
Street :
City : Champaign
State : IL **Country :** USA **Zip :** 61820-7233
Principal Contact : Dr. William R. Vavrik, Ph.D., P.E.
Vendor Contact Phone: (217) 356-4500 **Extension:**

FOR INFORMATION CONTACT THE BUYER

John W Estep
 304-558-2566
 john.w.estep@wv.gov

Vendor Signature X  **FEIN#** 85-0276434 **DATE** 05/04/2021

All offers subject to all terms and conditions contained in this solicitation

ADDITIONAL INFORMATION**REQUEST FOR QUOTATION:**

The West Virginia Purchasing Division is soliciting bids on behalf of the West Virginia Department of Transportation, Division of Highways (herein after referred to as "Agency") to establish a contract for mobile testing of the retroreflectivity of pavement markings. Per the Bid Requirements, Specifications, Terms and Conditions attached to this solicitation.

INVOICE TO**SHIP TO**

DIVISION OF HIGHWAYS
 TRAFFIC ENGINEERING
 DIVISION
 1900 KANAWHA BLVD E,
 BLDG 5 RM A550
 CHARLESTON WV
 US

DIVISION OF HIGHWAYS
 TRAFFIC ENGINEERING
 DIVISION
 1900 KANAWHA BLVD E,
 BLDG 5 RM A550
 CHARLESTON WV
 US

Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Total Price
1	MOBILE RETROREFLECTIVITY TESTING FOR PAVEMENT MARKINGS	1.00000	EA	See Exhibit A	

Comm Code	Manufacturer	Specification	Model #
78141600			

Extended Description:

MOBILE RETROREFLECTIVITY TESTING FOR PAVEMENT MARKINGS

SCHEDULE OF EVENTS

<u>Line</u>	<u>Event</u>	<u>Event Date</u>
1	Tech Questions due by 10:00 am	2021-04-27

	Document Phase	Document Description	Page
DOT2100000137	Final	MOBILE RETROREFELCTIVITY TETING FOR PAVEMENT MARKINGS	3

ADDITIONAL TERMS AND CONDITIONS

See attached document(s) for additional Terms and Conditions

STATE OF WEST VIRGINIA
Purchasing Division

PURCHASING AFFIDAVIT

CONSTRUCTION CONTRACTS: Under W. Va. Code § 5-22-1(j), the contracting public entity shall not award a construction contract to any bidder that is known to be in default on any monetary obligation owed to the state or a political subdivision of the state, including, but not limited to, obligations related to payroll taxes, property taxes, sales and use taxes, fire service fees, or other fines or fees.

ALL CONTRACTS: Under W. Va. Code §5A-3-10a, no contract or renewal of any contract may be awarded by the state or any of its political subdivisions to any vendor or prospective vendor when the vendor or prospective vendor or a related party to the vendor or prospective vendor is a debtor and: (1) the debt owed is an amount greater than one thousand dollars in the aggregate; or (2) the debtor is in employer default.

EXCEPTION: The prohibition listed above does not apply where a vendor has contested any tax administered pursuant to chapter eleven of the W. Va. Code, workers' compensation premium, permit fee or environmental fee or assessment and the matter has not become final or where the vendor has entered into a payment plan or agreement and the vendor is not in default of any of the provisions of such plan or agreement.

DEFINITIONS:

"Debt" means any assessment, premium, penalty, fine, tax or other amount of money owed to the state or any of its political subdivisions because of a judgment, fine, permit violation, license assessment, defaulted workers' compensation premium, penalty or other assessment presently delinquent or due and required to be paid to the state or any of its political subdivisions, including any interest or additional penalties accrued thereon.


"Employer default" means having an outstanding balance or liability to the old fund or to the uninsured employers' fund or being in policy default, as defined in W. Va. Code § 23-2c-2, failure to maintain mandatory workers' compensation coverage, or failure to fully meet its obligations as a workers' compensation self-insured employer. An employer is not in employer default if it has entered into a repayment agreement with the Insurance Commissioner and remains in compliance with the obligations under the repayment agreement.

"Related party" means a party, whether an individual, corporation, partnership, association, limited liability company or any other form or business association or other entity whatsoever, related to any vendor by blood, marriage, ownership or contract through which the party has a relationship of ownership or other interest with the vendor so that the party will actually or by effect receive or control a portion of the benefit, profit or other consideration from performance of a vendor contract with the party receiving an amount that meets or exceeds five percent of the total contract amount.

AFFIRMATION: By signing this form, the vendor's authorized signer affirms and acknowledges under penalty of law for false swearing (W. Va. Code §61-5-3) that: (1) for construction contracts, the vendor is not in default on any monetary obligation owed to the state or a political subdivision of the state, and (2) for all other contracts, that neither vendor nor any related party owe a debt as defined above and that neither vendor nor any related party are in employer default as defined above, unless the debt or employer default is permitted under the exception above.

WITNESS THE FOLLOWING SIGNATURE:

Vendor's Name: Applied Research Associates, Inc.

Authorized Signature:  Date: 05/04/2021

State of ILLINOIS

County of CHAMPAIGN, to-wit:

Taken, subscribed, and sworn to before me this 4 day of May, 2021.

My Commission expires 05/12/2023, 20 .



AFFIX SEAL HERE

NOTARY PUBLIC Jennifer L. Mitchaner



West Virginia Ethics Commission
Disclosure of Interested Parties to Contracts

(Required by *W. Va. Code* § 6D-1-2)

Name of Contracting Business Entity: Applied Research Associates, Inc. Address: 4300 San Mateo Blvd., NE, Suite A-220
Albuquerque, NM 87110-1295

Name of Authorized Agent: Cogency Global, Inc. Address: 1627 Quarrier St. East, Charleston, WV 25311

Contract Number: CRFQ 0803 DOT2100000137 Contract Description: Mobile Retroreflectivity Testing for Pavement Markings

Governmental agency awarding contract: West Virginia Department of Transportation

Check here if this is a Supplemental Disclosure

List the Names of Interested Parties to the contract which are known or reasonably anticipated by the contracting business entity for each category below (*attach additional pages if necessary*):

1. Subcontractors or other entities performing work or service under the Contract

Check here if none, otherwise list entity/individual names below.

2. Any person or entity who owns 25% or more of contracting entity (not applicable to publicly traded entities)

Check here if none, otherwise list entity/individual names below.

3. Any person or entity that facilitated, or negotiated the terms of, the applicable contract (excluding legal services related to the negotiation or drafting of the applicable contract)

Check here if none, otherwise list entity/individual names below.

Signature: 

Date Signed: 05/04/2021

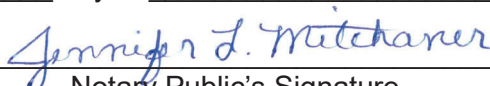
Notary Verification

State of Illinois, County of Champaign:

I, William R. Vavrik, Ph.D., P.E., Vice President & Div. Mgr., the authorized agent of the contracting business entity listed above, being duly sworn, acknowledge that the Disclosure herein is being made under oath and under the penalty of perjury.

Taken, sworn to and subscribed before me this 4th day of May, 2021.




Notary Public's Signature

To be completed by State Agency:

Date Received by State Agency: _____

Date submitted to Ethics Commission: _____

Governmental agency submitting Disclosure: _____

REQUEST FOR QUOTATION
Mobile Retroreflectivity Testing

10. VENDOR DEFAULT:

10.1. The following shall be considered a vendor default under this Contract.

10.1.1. Failure to perform Contract Services in accordance with the requirements contained herein.

10.1.2. Failure to comply with other specifications and requirements contained herein.

10.1.3. Failure to comply with any laws, rules, and ordinances applicable to the Contract Services provided under this Contract.

10.1.4. Failure to remedy deficient performance upon request.

10.2. The following remedies shall be available to Agency upon default.

10.2.1. Immediate cancellation of the Contract.

10.2.2. Immediate cancellation of one or more release orders issued under this Contract.

10.2.3. Any other remedies available in law or equity.

11. MISCELLANEOUS:

11.1. Contract Manager: During its performance of this Contract, Vendor must designate and maintain a primary contract manager responsible for overseeing Vendor's responsibilities under this Contract. The Contract manager must be available during normal business hours to address any customer service or other issues related to this Contract. Vendor should list its Contract manager and his or her contact information below.


Contract Manager: Ms. Carmine Dwyer, P.E.
Telephone Number: (217) 356-4500
Fax Number: (217) 356-3088
Email Address: cdwyer@ara.com

11.2. Non-Applicable Terms and Conditions: Note for clarification purposes, Sections 15, 15A, and 16 of the Instructions to Vendors Submitting Bids document is not applicable to this Contract due to the service being provided under this Contract not being under the scope of Contract types covered by these provisions. In addition, because no applicable

DESIGNATED CONTACT: Vendor appoints the individual identified in this Section as the Contract Administrator and the initial point of contact for matters relating to this Contract.

Carmine Dwyer, P.E.
(Name, Title)
Senior Civil Engineer
(Printed Name and Title)
100 Trade Centre Dr., Suite 200, Champaign, IL 61820-7233
(Address)
(217) 356-4500 / (217) 356-3088
(Phone Number) / (Fax Number)
cdwyer@ara.com
(email address)

CERTIFICATION AND SIGNATURE: By signing below, or submitting documentation through wvOASIS, I certify that I have reviewed this Solicitation in its entirety; that I understand the requirements, terms and conditions, and other information contained herein; that this bid, offer or proposal constitutes an offer to the State that cannot be unilaterally withdrawn; that the product or service proposed meets the mandatory requirements contained in the Solicitation for that product or service, unless otherwise stated herein; that the Vendor accepts the terms and conditions contained in the Solicitation, unless otherwise stated herein; that I am submitting this bid, offer or proposal for review and consideration; that I am authorized by the vendor to execute and submit this bid, offer, or proposal, or any documents related thereto on vendor's behalf; that I am authorized to bind the vendor in a contractual relationship; and that to the best of my knowledge, the vendor has properly registered with any State agency that may require registration.

Applied Research Associates, Inc.
(Company)

(Authorized Signature) (Representative Name, Title)

Dr. William R. Vavrik, Ph.D., P.E., Vice President & Division Manager
(Printed Name and Title of Authorized Representative)

05/04/2021
(Date)
(217) 356-4500 / (217) 356-3088
(Phone Number) (Fax Number)

Carmine E. Dwyer, P.E.

Senior Engineer

Professional Summary

Ms. Dwyer is a Senior Engineer and Group Leader in the Transportation Sector of Applied Research Associates. She joined ARA in 2004 after six years' service as an officer in the U.S. Air Force. She has over 20 years of project management experience and has delivered a diverse project portfolio, including projects in roadway and airfield pavement design and construction, pavement evaluation, roadway and airfield pavement management, sign and pavement marking management, and software development. Also, over the past 15 years, Ms. Dwyer has established an expertise in pavement markings.

Registration

Professional Engineer – Illinois

Education

M.S., Civil Engineering, University of Illinois at Urbana-Champaign, 2005

B.S., Civil Engineering, University of Illinois at Urbana-Champaign, 1997

Representative Experience

- *Florida Department of Transportation (2016 - Present):* Ms. Dwyer currently manages a 6.5-yr, approximately \$3.3M contract with the Florida DOT providing on-site support for the state's pavement marking management system (PMMS). She leads a team of three full-time staff, an engineer and two technicians, working on-site at the State Materials Office (SMO). The team owns, operates, and maintains two mobile retroreflectometer units (MRUs) and two handheld retroreflectometer units to collect 25,000 line-miles of pavement marking data annually. The data provides the districts with the information needed to determine their annual re-stripping needs.
- *Florida Department of Transportation (2016 - Present):* Ms. Dwyer currently manages a 5.5-yr, professional services contract with the Florida DOT providing pavement performance consultant services. The task work orders she's managed total approximately \$3.4M. Ms. Dwyer leads a team of six full-time staff, four engineers and two technicians, working on-site at the SMO. Services provided by these staff include high-speed profiler data collection and analysis for construction quality assurance, FWD data collection and analysis for project design, LCMS data analysis and reporting, and NTPEP pavement marking test deck data collection.
- *West Virginia Division of Highways (2018 – 2020):* In 2018, 2019, and 2020, Ms. Dwyer led the MRU data collection and analysis of approximately 37,000 total line-miles of long line pavement markings for the West Virginia DOH. The deliverables included detailed and summary reports, Excel summary spreadsheets, and video files for every section surveyed. The provided reports indicate which sections failed (fell below a minimum retroreflectivity value) for the DOH to enforce quality control of newly striped interstate and secondary two-lane roads.
- *Illinois Tollway – Pavement Marking Management (2008 – Present):* In 2008 Ms. Dwyer implemented the Illinois Tollway's PMMS. The PMMS database contains annual network-wide retroreflectivity and presence measurements of approximately 1,500 line-miles of pavement markings. In 2009 she developed a Pavement Marking Index (PMI) as a standardized, objective, and

repeatable method for combining retroreflectivity and presence into one performance metric. The PMI has been used every year since to recommend the Illinois Tollway's restriping needs.

- *South Mountain Freeway, Phoenix, AZ (2021)*: In early 2021, Ms. Dwyer led the MRU, IRI, and friction testing data collection and analysis for the entire South Mountain Freeway in Phoenix, AZ. The freeway is 22 centerline miles long, has three lanes plus one HOV lane in both directions, and includes 16 interchanges. Retroreflectivity and IRI data was delivered for both the mainline and ramps, and friction testing was delivered for the mainline only. Fluor Industrial Services is contracted with the Arizona Department of Transportation to maintain the freeway, and the data provided helps Fluor assess if the roadway is compliant with performance requirements.
- *Michigan Department of Transportation (2019)*: In 2019, Ms. Dwyer led the MRU data collection and analysis of approximately 3,000 total line-miles of long line pavement markings for the Michigan DOT. The scope included sampling two to five-mile sections of most or all state routes in the Southwest, University, and Bay Regions. The deliverables included summary reports on retroreflectivity and condition/presence value as well as sample videos.
- *Illinois Department of Transportation (2009 – 2014)*: Ms. Dwyer served as principal investigator for an Illinois DOT study to establish a pavement marking material selection and installation inspection guide. She was responsible for monitoring the durability and visibility of multiple pavement marking products on both asphalt and concrete surfaces throughout the state. Annual test site evaluations incorporated the use of both the presence analysis program and the pavement marking index developed by Ms. Dwyer. The pavement marking guide provides IDOT with the necessary tool to select the most appropriate and cost-effective markings for many different scenarios.
- *Illinois Tollway – Pavement Marking Study (2006 – Present)*: Since 2006, Ms. Dwyer has led the Illinois Tollway's pavement marking research, and she currently serves on the Tollway's Pavement Marking Task Force. A total of six test sections with multiple pavement marking systems have been evaluated since 2006. Ms. Dwyer has provided essential quality assurance during the installation of test sections and annually monitors marking durability, wet and dry retroreflectivity, and color.

Honors and Recognitions

- Illinois Center for Transportation and Illinois Department of Transportation 2015 High Impact Research Award (Principal Investigator)

Affiliations

Chair - Transportation Research Board (TRB) Signing and Marking Materials Committee
American Society of Civil Engineers (ASCE) T&DI, CAV Impacts Committee

Selected Publications and Presentations

Dwyer, Carmine E. and William R. Vavrik, Development of a Pavement Marking Condition Index from Retroreflectivity and Presence Measurements, Presented at the 91st Annual Meeting of the Transportation Research Board, January 22-26, 2012, Washington, D.C.

Dwyer, Carmine E., W. Vavrik, and R. Becker. Pavement Marking Selection Guide for the Illinois Department of Transportation, Presented at the 94th Annual Meeting of the Transportation Research Board, January 10-15, 2015, Washington, D.C.

Shrivatsa Ravikumar

Staff Engineer

Professional Summary

Mr. Ravikumar joined ARA as a full-time employee in September 2013. He has primarily worked on pavement maintenance and identifying pavement distresses. Mr. Ravikumar has about 6 years of work experience, in pavement evaluation, maintenance, and asset management. Presently employed as a Project Engineer at Applied Research Associates Inc., Mr. Ravikumar currently works on supporting the Illinois Tollway system through maintenance of the current materials management task and also developed a revised software to review and approve QC/QA materials testing data for asphalt, concrete and aggregates.

Mr. Ravikumar has been involved in the collection, processing and analysis of pavement marking data for various statewide pavement marking data collection. Mr. Ravikumar has worked with various DOT's: Florida Department of Transportation (FDOT), West Virginia Department of Highways (WVDOH), Michigan Department of Transportation (MDOT) and the Illinois Tollway. This process uses a mobile retroreflector unit (MRU) which collects and classifies the pavement marking quality. Mr. Ravikumar has developed collection protocols for increased efficiency and also tools for Quality control of data both in the field and in the office to ensure data consistency and quality. He has also developed automated reporting systems that can be used to generate customizable reports that will fit into any required specifications.

Education

M.S. in Civil Engineering, Georgia Institute of Technology, 2013

B.S. in Civil Engineering, National Institute of Technology, Trichy, India, 2011

Experience

- **Pavement Marking Management System**
 - **Florida Department of Transportation (2016)**

Mr. Ravikumar worked on setting up the on-site Pavement Marking Management System (PMMS) at the State Materials Office (SMO) for the statewide marking data collection for the Florida DOT. He worked on developing the software for data collection, analysis and processing on 25,000 miles of annual pavement marking data using Mobile Retroreflector Units (MRUs).
 - **West Virginia Division of Highways (2018 – 2020)**

From 2018 through 2020, Mr. Ravikumar assisted with leading the data collection and analysis of approximately 37,000 total line-miles of long line pavement markings for the West Virginia DOH. He developed the system of converting the MRU csv data into the required MS Excel sheet formats. Mr. Ravikumar worked on identifying the failed sections which are below the standard minimums to help the DOH enforce quality control of the roads.
 - **Michigan Department of Transportation (2019)**

Mr. Ravikumar worked on the collection of 3,000 total lines-miles of long line pavement markings for the Michigan DOT. He developed routing for different sampling sections for collection. Mr. Ravikumar also performed the data analysis for the reports, calculated the marking presence value, and selected sample videos for submittal.

- **PaVision**

Mr. Ravikumar has worked on designing ARA's low-cost solution for pavement distress data collection with high resolution camera. Mr. Ravikumar has worked with various state DOTs, cities and counties, forest service preserves and also smaller organizations to ensure quality data and reporting for use in their pavement management systems. The PaVision system captures pavement distress images and accelerometer data at normal driving speeds. The information collected is then parsed into the various data parts used for analysis. This data is then used to calculate PCI and roughness comparable to the IRI standards. Mr. Ravikumar created a process-flow for automated data transfer and created integration of various software for pavement rating calculations. He has created automatic report generating procedures and also analyzed the final data to improve both data collection and data processing procedures.
- **Illinois Materials Reporting and Inspection System (I-MIRS)**

Mr. Ravikumar is the task manager for the development and maintenance of I-MIRS for the Illinois Tollway. This is an electronic, web-based Quality Control/Quality Assurance (QC/QA) reporting system that allows for users to upload data and view it in real time. It allows the users to report QC, QA and IA data independently and makes test results available to all contractors, consultants, and agency personnel. The system can be customized to meet any agency's specification and it can be integrated with an agency's construction and pavement management systems.
- **SHRP2 R09 Risk Management Template**

Mr. Ravikumar has been the core member of the team in developing a Risk management template for the FHWA to predict the impact and severity of various risks on the project schedule and cost based on the R09 guidebook. This excel based software is used to identify potential risks during design-build and design-bid-build projects. The software analyses the impact of the risks, effectiveness of mitigation strategies and provides users with information regarding the cost, duration and disruption involved in the process. The user-defined risks can be customizable and also using the mitigation strategies along with their impacts allow the users to generate various outcomes and timelines and finally coming up with the best strategy and cost efficiency for the projects.
- **Illinois Tollway Performance Related Specifications (PRS)**

Mr. Ravikumar worked on developing the framework for the Illinois Tollway PRS, the largest performance-related specifications programs for jointed plain concrete pavement construction. Mr. Ravikumar developed an Excel based software that allows for entry and consolidation of various factors – Strength, Air %, Dowel Alignment, Roughness and Thickness. This software contains checks for the data entry timelines and also calculates final pay factors. These factors are used to calculate the final pay to the contractors.

Jacob Bennett

Senior Civil Engineering Technician

Education

B.S., Geology: Earth and Environmental Science, University of Illinois at Urbana-Champaign

Work Activities

Data collection and analysis. Falling Weight and Rolling Wheel Deflection Testing, Mobile Retroreflector Testing, Friction Testing, Pavement Coring, Pavement Condition Surveys, and Sign Management.

Certifications

Class A Commercial Driver's License (CDL)

Pertinent Experience

Mobile Retroreflector Unit (MRU) Testing

Loop 202 (South Mountain Freeway) - Phoenix, AZ (February 2021)

Mr. Bennet operated ARA's MRU, a Laserlux G7 (LLG7), to collect retroreflectivity data on Loop 202 in Phoenix, AZ. A total of 220 line-miles of mainline long-line marking data was collected, as well as every long-line marking on all 16 interchanges. Mr. Bennet's responsibilities included daily set-up of dual mounted MRUs, daily calibrations, data collection and also quality control and upload of collected data.

West Virginia Department of Transportation - Various Locations, WV (2019 - 2020)

Mr. Bennet was involved in the Mobile Retroreflectivity data collection of approximately 29,000 total line-miles of long line pavement markings for the West Virginia DOH. His responsibilities included daily calibrations, data collection and also quality control and upload of collected data.

District of Columbia Department of Transportation - Washington, DC (2019)

Mr. Bennet operated ARA's MRU, an LLG7, to collect pavement marking retroreflectivity data for the entire city of the District of Columbia. His responsibilities included daily calibrations, equipment operation, and quality control.

Snowplowable Pavement Marker Study - St. Louis, MO (January 2020)

Mr. Bennet operated ARA's MRU, an LLG7, to collect retroreflectivity data and pavement marker count data on several routes in the St Louis area. The marker count data was used to assess the performance of a plastic inlaid pavement marker being evaluated by the Missouri DOT.

Falling Weight Deflection Testing

Interstate 20 - Georgia Department of Transportation - Atlanta, GA (February 2020)

North Tarrant Expressway - North Texas Tollway Authority - Fort Worth, TX (December 2019 - Present)

PA 248 - Pennsylvania Department of Transportation - White Haven, PA (December 2019)

US 89 - Utah Department of Transportation - Layton, UT (October 2018)

GRI Turbine Towers - Amarillo, TX (November 2017)

Hartsfield Jackson Atlanta International Airport - Atlanta, GA (December 2016 - Present)

McAlester Regional Airport - City of McAlester - McAlester, OK (November 2016)

Interstate 55 - Illinois Department of Transportation - Chicago, IL (October 2016)

Will Rogers Turnpike - Oklahoma Turnpike Authority - Miami, OK (May 2016)

Windsor Road - City of Urbana - Urbana, IL (May 2016)

Tucson International Airport - Tucson Airport Authority - Tucson, AZ (December 2015)

Quilt Block Wind Farm - Highway Department - Lafayette County, WI (December 2015)

Indiana Toll Road - Department of Transportation - Elkhart, IN (October 2015 - Present)

Lawrence County Highway 8 - Highway Department - Lawrenceville, IL (July 2015)
Orland Parkway - Village of Orland Park - Orland Park, IL (July 2015)
Main Street and Stadium Boulevard - Transportation Authority - Ann Arbor, MI (November 2014)
Missouri State Highway 61 - Department of Transportation - Bowling Green, MO (September 2014)
Adams County Heavy Moving - Highway Department - Quincy, IL (September 2014)
Illinois Tollway - Illinois State Toll Highway Authority - Chicago, IL (June 2014 - Present)
Multiple Wind Farm Developments - Various Locations, IL (May 2014 - Present)
Interstate 55 - Missouri Department of Transportation - Perryville, MO (May 2014)
Interstate 15 Point - Department of Transportation - Salt Lake City, UT (March 2014)
Texas State Highways 183 & 114 - Department of Transportation - Dallas, TX (October 2013)
Fayette County Highway 14 - Highway Department - Herrick, IL (October 2013)

Rolling Wheel Deflection Testing

Federal Highway Administration & Mississippi Department of Transportation - Jackson, MS (May 2019)
Alberta Ministry of Highways and Infrastructure - Edmonton, AB (September 2017)
Kane County Highway Department - Aurora, IL (July 2016)
Sangamon County Highway Department - Springfield, IL (November 2015 - Present)
Adams County Highway Department - Quincy, IL (May 2015 - Present)
North Texas Tollway Authority - Dallas, TX (April 2015)
Indiana Toll Road - Elkhart, IN (October 2014)
Champaign County Highway Department - Champaign, IL (September 2014 – Present)
MnRoad Research Facility - Maplewood, MN (September 2013)
Saskatchewan Ministry of Highways and Infrastructure - Regina, SK (August 2013)
Oklahoma Department of Transportation - Elk City, OK (May 2013)
Pennsylvania Department of Transportation - Mansfield, PA (April 2013)

Pavement Coring and Dynamic Cone Penetrometer Testing

County Highway 1 - Sangamon County Highway Department - Springfield, IL (August 2019)
Multiple Locations - Missouri Department of Transportation - Various Locations, MO (August 2019)
Interstate 55 - Illinois Department of Transportation - Chicago, IL (November 2016)
Windsor Road - City of Urbana - Urbana, IL (August 2016)
Middletown Prairie Elementary - Mahomet Seymour Community Schools - Mahomet, IL (May 2016)
Virtual Road Weather Information Study - Various Locations, IL (September 2015)
Orland Parkway - Village of Orland Park - Orland Park, IL (July 2015)
Illinois Tollway - Illinois State Toll Highway Authority - Chicago, IL (July 2014 – Present)
Multiple Wind Farm Developments - Various Locations, IL (May 2014)

Digital Survey Vehicle and Pavement Condition Survey

Missouri Department of Transportation - Various Locations, MO (August 2019)
DuPage County Highway Department - Aurora, IL (November 2019 - Present)
Lee County Highway Department - Fort Myers, FL (February 2019)
Sangamon County Highway Department - Springfield, IL (December 2018 - Present)
Mountain Valley Pipeline - Various Locations, WV (March 2018 - Present)
Dakota Access Pipeline - Various Locations, IL (May 2016)
Kane County Highway Department - Aurora, IL (May 2016)
Illinois State Toll Highway Authority - Chicago, IL (September 2015 – Present)
Los Angeles International Airport - Los Angeles, CA (December 2014)
City of Chicago - Chicago, IL (June 2014)

Kimberly L. DeMay

Senior Engineering Technician

Education

A.S., Civil Engineering Technology, Lake Land College, 1987

Professional Summary

Ms. DeMay has over 30 years of experience conducting a variety of data collection. She is responsible for collecting mobile and handheld retroreflectometer data, creating GIS/CADD maps, researching and compiling pavement construction history, developing databases, and preparing reports. She has created individual and overall maps for a variety of airports for use in reports, map linking to MicroPAVER using ArcMap 9.2, and other purposes. Ms. DeMay has participated in projects for statewide retroreflectivity data collection, statewide airport surveys, commercial airports, Air Force bases, cities, and other facilities.

Representative Experience

Mobile Retroreflectometer Unit (MRU) Data Collection

- *West Virginia DOH Statewide Pavement Marking Data Collection (2019-2020)*
Ms. DeMay was instrumental in collecting approximately 29,000 total line-miles of long-line pavement marking data for the WVDOH. Her responsibilities included ensuring daily calibration of ARA's LaserLux G7 (LLG7) unit, efficient data collection and equipment operation, and also quality control and upload of collected data.
- *Loop 202 (South Mountain Freeway) MRU Data Collection – Phoenix, AZ (February 2021)*
Ms. DeMay operated ARA's MRU, an LLG7, to collect retroreflectivity data on Loop 202 in Phoenix, AZ. A total of 220 line-miles of mainline long-line marking data was collected, as well as every long-line marking on all 16 interchanges. Ms. DeMay's responsibilities included daily set-up of dual mounted MRUs, daily calibrations, data collection and also quality control and upload of collected data.

Handheld Retroreflectometer Unit Data Collection

- Illinois Tollway pavement marking test sections (2007 – Present)

Airport Pavement Condition Studies and Management Systems

- Missouri statewide airport pavement condition study and airport pavement management system
- Iowa statewide airport pavement condition study and airport pavement management system
- Virginia statewide airport pavement condition study and airport pavement management system
- California statewide airport pavement condition study and airport pavement management system
- New York statewide airport pavement condition study and airport pavement management system
- Colorado statewide airport pavement condition study and airport pavement management system
- South Carolina statewide airport pavement condition study and airport pavement management system
- Airport pavement condition studies and pavement management systems for multiple International airports: Portland, Chicago O'Hare, Chicago Midway, Washington Dulles, Rochester, Niagara Falls, Huntsville, and Plattsburgh
- Airport pavement condition studies and pavement management systems at several general aviation/regional airports, including Idaho Falls Regional Airport, Edmonton Municipal Airport, and St. Croix Airport (US Virgin Islands)

- Airport pavement condition studies and pavement management systems at non-US airports, including San Juan, Jose Aponte de la Torre, Aguadilla, and Ponce Airports in Puerto Rico
- Airfield pavement evaluations (PCI surveys) at the Shuttle Landing Facility, Kennedy Space Center, Florida
- Airfield pavement condition studies at DHL Express, Inc. (Ohio)

Military Airport Pavement Condition Studies and Management Systems

- Ms. DeMay has conducted airfield pavement condition studies (PCI surveys) and MicroPAVER implementations at several United States Air Force bases worldwide, including: Columbus AFB (MS), Cannon AFB (NM), Scott AFB (IL), Luke AFB (AZ), Davis-Monthan AFB (AZ), Altus AFB (OK), Ellsworth AFB (SD), McConnell AFB (KS), Sheppard AFB (TX), Nellis AFB (NV), Creech AFB (NV), Fairchild AFB (WA), Lackland AFB (TX), Minot AFB (ND), Misawa AFB (Japan), Laughlin AFB (TX), and Little Rock AFB (AR)