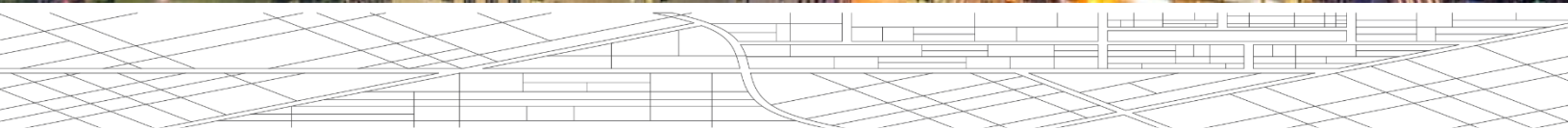# North Central Texas Council of Governments
Proposal for Pavement Analysis and Related Services
RFP 2022-036

Tab A

Prepared by:

Roadway Asset Services, LLC.
6001 W Parmer Lane
Suite 370-1102
Austin, Texas 78727
bwilliamson@roadwayassetservices.com
210-837-5249

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REQUEST FOR PROPOSALS
For
PAVEMENT ANALYSIS AND RELATED SERVICES
RFP # 2022-063

Sealed proposals will be accepted until **2:00 PM CT, Tuesday February 21, 2023,** and then publicly opened and read aloud thereafter.

Roadway Asset Services, LLC
Legal Name of Proposing Firm

Bart Williamson   Chief Executive Officer
Contact Person   Title

210-837-5249   bwilliamson@roadwayassetservices.com
Telephone Number   E-Mail Address

6001 W Parmer Lane, Suite 370-1102   Austin, TX   78727
Street Address of Principal Place of Business   City/State   Zip

6001 W Parmer Lane, Suite 370-1102   Austin, TX   78727
Complete Mailing Address   City/State   Zip

Acknowledgment of Addenda: #1 ✓ #2 ✓ #3 _____ #4 _____ #5 _____

By signing below, you hereby certify that the information contained in this proposal and any attachments is true and correct, and may be viewed as an accurate representation of proposed services to be provided by this organization. You agree that failure to submit all requested information may result in rejection of your company's proposal as non-responsive. You certify that no employee, board member, or agent of the North Central Texas Council of Governments has assisted in the preparation of this proposal. You acknowledge that you have read and understand the requirements and provisions of this solicitation and that the organization will comply with the regulations and other applicable local, state, and federal regulations and directives in the implementation of this contract. And furthermore that I certify that I am legally authorized to sign this offer and to submit it to the North Central Texas Council of Governments, on behalf of said offeror by authority of its governing body.

_____
Authorized Signature

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February 24, 2023

Brent Moll, Purchasing Division, NCTCOG
616 Six Flags Drive
Arlington, TX 76011

Cover Letter

Dear Mr. Moll and the Selection Committee:

Roadway Asset Services, LLC (RAS) is pleased to submit this proposal for RFP 2022-063, Pavement Analysis and Related Services. While the RAS team services municipal agencies across the Country, RAS is uniquely qualified to service the Dallas-Fort Worth Metroplex as the assigned Project Manager and Licensed Texas Professional Engineer, Scot Gordon, resides in Highland Village and has spent most of his career interpreting distress manifestations on Texas roadways while considering local design challenges when evaluating pavement conditions. Mr. Gordon's proximity to collection sites enables him to be available for impromptu onsite meetings should questions arise. Specifically, RAS can provide the following to participating agencies of the contract:

➢ **Project Understanding** – RAS understands NCTCOG is seeking qualified vendors to perform automated pavement condition assessments in accordance with the ASTM D6433 standards while also providing options for roadside feature inventory development (photogrammetry & Lidar). In addition, the RAS Team can evaluate the pavement structure utilizing an FWD and GPR equipment. The RAS team can then expand our analysis support by conducting financially optimized budget scenarios and prioritized multi-year planning.

➢ **Unrivaled Pavement Management Experience** – Our Texas headquartered Engineering firm is comprised of industry experts assisting municipalities in the field of pavement and asset management. Throughout their careers, the RAS leadership team has managed pavement data and ROW asset collection for the following Texas municipalities: Fort Worth, Arlington, San Antonio, Austin, Corpus Christi, Lewisville, Colleyville, Little Elm, Mesquite, Burleson, Denton, Amarillo, Greenville, Rockwall, Rowlett, Galveston, and Seguin. RAS' diverse clientele has also resulted in pavement data collection for several large agencies such as Memphis, TN; Denver, CO; Charlotte, NC; Durham, NC; Salt Lake City, UT; Tallahassee, FL; Pima County, AZ; and many others.

➢ **Automated Data Collection Technology** – The RAS team uses the latest technology **(LCMS-2 and 360 cameras) to collect ASTM D6433 distresses,** IRI, and right-of-way asset attributes. Roadway Asset Collection (RAC) vehicles are equipped with an inertial profiler that was independently certified by **Texas A&M Transportation Institute in July 2022**. With one-millimeter horizontal resolution (equivalent to 4,000 laser points), the 2-sensor LCMS device far exceeds the minimum requirement of 4, 7, or 9 independent laser sensors.

➢ **Commitment to Diversity** – RAS strives to create equal opportunities for small businesses and those underutilized/disadvantaged. RAS has incorporated partners from DBE-certified firms for the following projects: Austin, TX; Corpus Christi, TX; Memphis, TN; Tallahassee, FL; Greenville, SC. Local consultant and certified DBE/MBE/HUB, HVJ, has teamed with RAS for Austin, Corpus Christi, and Forney, TX.

We look forward to continuing our long-term relationship with agencies in the Dallas-Fort Worth Metroplex and across the Country. RAS has reviewed the RFP, Addendum 1, and Addendum 2 in its entirety and this proposal will remain valid for 180 days from the date of submission. RAS' main point of contact is Bart Williamson, FCLS, (210)837-5249, bwilliamson@roadwayassetservices.com.

Sincerely,

Bart Williamson, CEO
602 Sante Fe Drive, Highland Village, TX, 75077
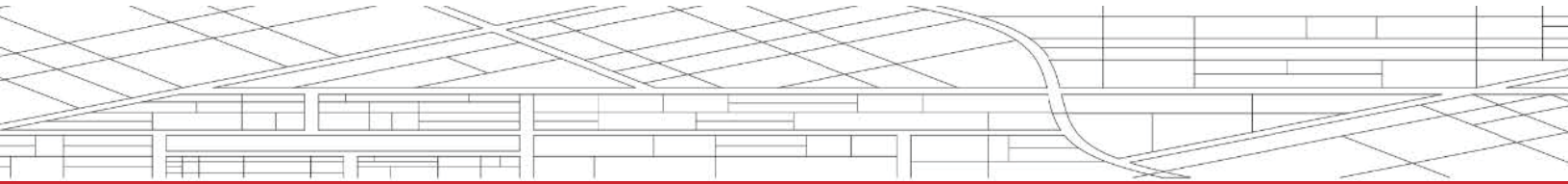
Tab B: Executive Summary

Tab B: Executive Summary

Firm Background

Roadway Asset Services, LLC (RAS) is a Texas Engineering Firm (License #: F-22104) headquartered in Austin, Texas with a regional office in the Dallas-Fort Worth Metroplex. RAS' 24 team members have managed automated pavement data collection, processed HD imagery, performed pavement QA/QC, supplied GIS based deliverables, developed right of way asset inventories, loaded data to 3rd party pavement management programs, completed budgetary modeling, and developed customized multi-year prioritized pavement management plans for Cities, Counties, and MPOs across the United States.

RAS offers comprehensive experience and subject matter expertise in the fields of engineering, surveying, asset management, transportation planning, and GIS. The RAS executive team composed of Scot Gordon, Bart Williamson, and Rafael Rivera have **a unique understanding of pavement conditions with members in NCTCOG as they led pavement condition and Right-of-Way (ROW) assessments for Fort Worth, Plano, and Arlington through the Data Transfer Solutions' (DTS) contract.** Senior Vice President Zac Thomason has also led pavement condition assignments with members in NCTCOG for Denton, Grand Prairie, Keller, Flower Mound, Carrollton, The Colony, Euless, and Hurst through the IMS Infrastructure Management Services (IMS) contract.

Additionally, the RAS team has extensive experience rating pavement per the ASTM D6433 methodology using both the traditional sampling methodology and the automated linear approach using advanced mobile automated technology, sensor based ASTM D6433 distress quantification, Artificial Intelligence (AI) enhanced processing routines, and rigorous hands-on Quality Control (QC) by an experienced pavement engineering team. **Since our inception in 2020, RAS has obtained 63 contracts from transportation agencies for pavement condition surveys and ROW asset inventories which translates to 67,000 miles of roadways managed. In addition, the RAS executive team brings a combined 100 years of experience in pavement condition survey management.** Throughout their careers, the RAS leadership team has been involved in pavement condition and ROW asset surveys for similar projects across the State of Texas including:

- Fort Worth
- Houston
- Rowlett
- Bexar County
- Amarillo
- Seguin
- New Braunfels

- Plano
- San Antonio
- Austin
- Denton
- Greenville
- Central Texas RMA
- Pflugerville

- Arlington
- Harris County
- Rockwall
- Burleson
- Corpus Christi
- Galveston
- Friendswood

The RAS team offers the NCTCOG member agencies unmatched subject matter expertise and knowledge ranging from managing and delivering municipal automated pavement data collection projects, to right of way asset inventory development, and configuration of asset management tools/software. RAS can perform pavement data collection (service category #1), asset inventory (service category #2), pavement management analysis (service category #3), electronic products (service category #4), pavement structural analysis (service category #5), GIS related services (service category #6), and value-added services (service category #7). To complete the required service categories, RAS would mobilize one or more Roadway Asset Collection (RAC) vehicles from its fleet of four to perform an automated data collection that provides a **100% linear assessment** of the roads driven. **This methodology removes the subjectivity of rating small sample areas of the road segment.** Unlike many other consultants, RAS utilizes a ROW capture system to provide an **immersive 360 view** versus stationary independent camera views. Furthermore, RAC vehicles have **received independent inertial profiler certification for accuracy and repeatability from Texas A&M Transportation Institute (TTI).** In addition to our fleet, our strategic partnership with our equipment manufacturer allows us to mobilize **additional identical RAC vehicles** should capacity need to be expanded upon. RAS will further expound on RAC vehicles specifications and data processing on page 14 of this proposal submission.

RAS is a financially secure limited liability company that practices strong internal controls and conservative business practices for continued financial growth. The letter below provides documentation of financial stability.

To Whom It May Concern:

Our firm has prepared tax returns for Roadway Asset Services, LLC for the previous two years. To the best of our knowledge the company can cover its short- and long-term liabilities and there are no outstanding local, state, or federal tax levies against the company or its ownership. Roadway Asset Services, LLC is in sound financial condition.

Mason Gardner, CPA, CMA, CFM

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Proprietary Information

RAS Subconsultants

Founded in 1986, ESP Associates, Inc. (ESP) is a multi-disciplinary engineering design and consulting firm providing clients with civil engineering, surveying, planning/landscape architecture, geosciences, environmental, and construction engineering inspection. RAS has teamed with ESP to assist with **ground penetrating radar for relocating utilities (asset inventory, service category #2) and Mobile LiDAR services (service category #7)** through one of ESPs five mobile mapping vehicles. ESP owns and operates a Reigl VMX-1HA, Two Trimble MX8, a Trimble MX9, and a Leica Pegasus Two Ultimate. This technology allows ESP to deploy mobile mapping across various regions of the nation efficiently. Mobile mapping allows for automated data/asset extraction of topographic features, as well as assisting in feature identification and asset management. As a data collection firm with over 650 staff members across the United States, ESP can provide additional support to the following service categories if needed: **pavement data collection (service category #1), pavement management analysis (service category #3), electronic products (service category #4), and GIS related services (service category #6).** ESP is a financially secure incorporation that continues to expand services to a wide variety of municipalities and transportation agencies. The RAS and ESP team has previously collaborated to conduct pavement management services for the following projects: Amarillo, TX; Pflugerville, TX; Seguin, TX; Rochelle, IL; Pennington County, SD; and Topeka, KS.
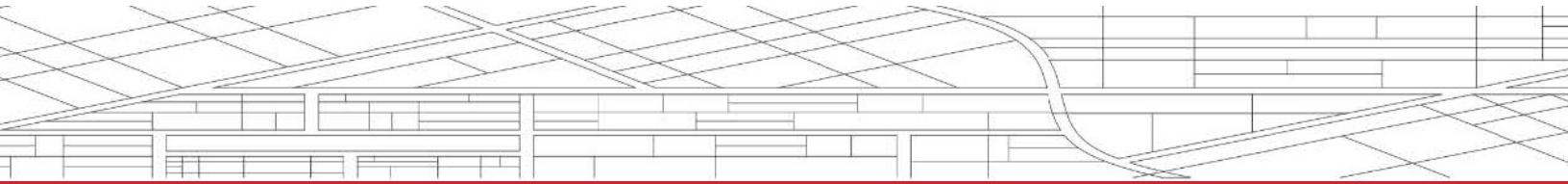
RAS has also partnered with HVJ Associates to assist with conducting friction testing (pavement data collection, service category #1) and pavement structural analysis (service category #5). HVJ brings 35 years of experience, specializing in geotechnical services, construction materials engineering and testing, pavement design, and environmental services. **HVJ is a certified small business enterprise (SBE), DBE, MBE, HUB, with 83 employees that is registered by the Texas Board of Professional Engineers (Registration No. F-000646).** HVJ is a financially secure business that has provided pavement analysis services for Houston, TX; San Antonio, TX; Corpus Christi, TX; Round Rock, TX; Lubbock, TX; Sugar Land, TX; Southlake, TX; Forney, TX; Trophy Club, TX; Travis County, TX; Fair Oaks Ranch, TX; and Grand Harbor POA, TX.

Proprietary Information

Tab C: Experience and Key Personnel

Tab C: Experience and Key Personnel
1. Overview and Brief History of Respondent

The RAS executive team has managed over 100,000 miles of pavement condition survey and ROW asset data in the last 5 years. To ensure consistency with projects, RAS has assigned the following team members to roles that they have previously fulfilled. By utilizing previously established roles, RAS can guarantee seamless project ownership for the various phases of the pavement condition assessment including data collection, analysis, and reporting. **RAS' Senior Pavement Engineer, Scot Gordon, PE, IAM,** will serve as a Project Manager for the NCTCOG contract member agencies. As a graduate from Texas A&M and an understudy of Dr. Roger Smith (well renowned in the pavement management industry), Scot is considered an expert in the interpretation of distress manifestation on roadways. Mr. Gordon has spent most of his career fulfilling Texas jobs and recently served as President of the ACEC Tarrant County Chapter. His local knowledge of design challenges and conditions for a variety of Texas clients makes him an expert in the field review of data. Scot Gordon will establish lines of authority for all team members and any necessary subconsultants. Scot will perform the RAS field pilot study as a part of the teams QA/QC workflow, deliver final reports, review distress interpretations, and maintain communication between the RAS team and NCTCOG agencies.

Project Principal, Bart Williamson, FCLS will work with Mr. Gordon to coordinate project needs and ensure high-quality deliverables are received in a timely manner. **Assistant Project Manager, Zac Thomason, MBA,** has over 17 years of experience as a pavement management consultant utilizing automated technologies, adhering to the ASTM D6433 standards, and providing expertise in pavement maintenance financial optimization techniques. Mr. Thomason will work alongside RAS' **Quality Assurance/Quality Control Manager, Mark Kramer, PE, MBA** who will review data and ensure 100% collection of the network. Mr. Kramer will coordinate with RAS pavement evaluation and GIS team members to maintain constant communication, discuss project status, and update resources needed for the timely and accurate completion of the project. Following Mr. Gordon and Mr. Thomason's leadership is **Data Collection Manager, Rafael Rivera**, who is responsible for updating schedules based on collection status, overseeing the daily operation crew, and initiating/reviewing the evaluation process for pavement and ROW assets. **Sandra Marrero, EI will**

RAS ADVANTAGE

- **Unrivaled Texas Pavement and ROW Asset Inventory Experience**
- **Bronze Esri Business Partner**
- **Field Validation of Pilot Area with 30-year Experienced Pavement Engineer**
- **True 360-degree Image Capture**
- **Precise and Automated Asset Inventory Capabilities**
- **Unequaled Technology & Data Redundancy**
- **Unmatched PMS software Expertise**
- **Unique Understanding of Pavement Design and Pavement Performance**

serve as the Project Engineer, providing leadership to our pavement evaluation staff and supplying initial quality control to the pavement database. Ms. Marrero will also work with an agency's staff to produce the project deliverables and final reports for the project. **GIS Specialist, Kelly Baar,** will conduct data linking to coordinate pavement and ROW imagery to an appropriate RAS ID, distress data processing using the **RoadTRIP™** software, patch review to ensure 100% of the network is complete, and will finish her workflow by conducting a PCI review and quality assurance exercise.

Mobile LiDAR Specialist, Brad Adams, PE, will assist with the evaluation and inventory of ROW assets utilizing one out of the five mobile mapping vehicles should mobile Lidar be selected over photogrammetry techniques. **Frank Carmichael, PE**, will serve as the **Structural Testing Manager** by managing the Falling Weight Defectometer field crew, ensuring proper recording/measurement of sensor data, and developing a Structural Index for use in the pavement management program if desired by member agencies.

The RAS Texas offices include locations in the Dallas-Fort Worth Metropolitan area and Austin area (**RAS headquarters**). The RAS Team is well versed with local conditions that affect pavement performance due to our extensive reach and performance in the region.

Organizational Chart

Organizational structure is important to understand as it can often shed light on whom a municipal agency will really be working with on any given assignment. While NCTCOG can select any qualified data collector as a short-term vendor, RAS prefers to develop long term consultative relationships with our clients that result in turn-key pavement management implementations that exceed client expectations. The Key Personnel assigned to this project are all long-time veterans of the industry and have extensive experience in pavement distress field rating, Pavement Condition Index (PCI) processing, multi-year prioritization, software import and implementation, optimization modeling, and custom database integrations.

PROJECT ORGANIZATION AND STAFFING CHART
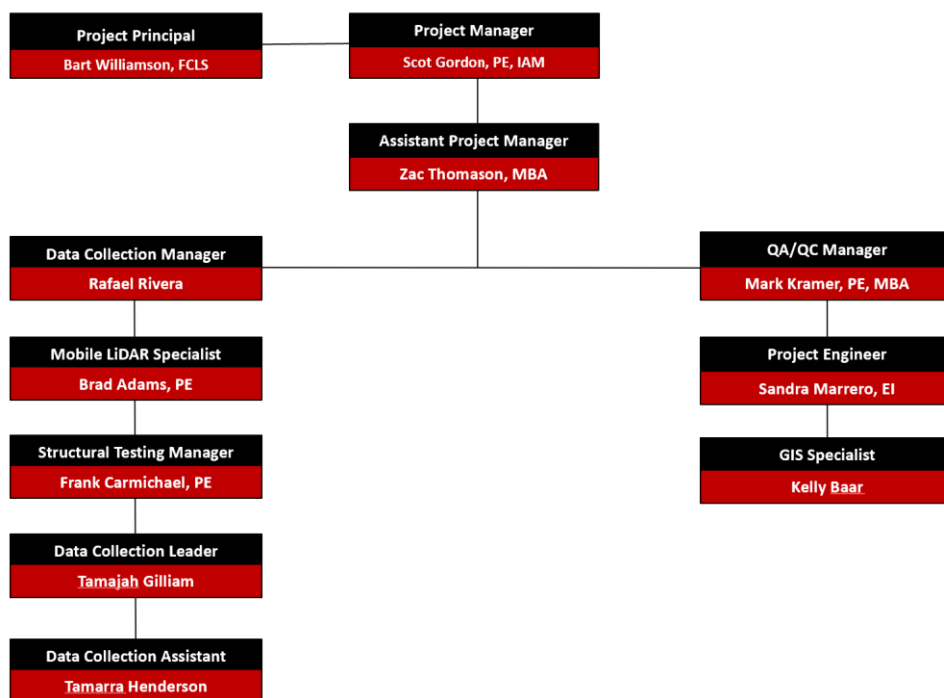
Contact Information

Team members assigned to the NCTCOG's contract can be reached by contacting the following phone numbers or emails.

Name	Role	Phone Number	Email
Scot Gordon, PE, IAM	Project Manager	(214)789-9941	sgordon@roadwayassetservices.com
Bart Williamson, FCLS	Project Principal	(210)837-5249	bwilliamson@roadwayassetservices.com
Zac Thomason, MBA	Assistant Project Manager	(623)640-2897	zthomason@roadwayassetservices.com
Mark Kramer, PE, MBA	QA/QC Manager	(480)606-8775	mkramer@roadwayassetservices.com
Rafael Rivera	Data Collection Manager	(407)701-6397	rrivera@roadwayassetservices.com
Sandra Marrero, EI	Project Engineer	(787)308-8858	smarrero@roadwayassetservices.com
Kelly Baar	GIS Specialist	(678)451-7749	kbaar@roadwayassetservices.com
Frank Carmichael, PE	Structual Testing Manager	(737)222-5151	FCarmichael@hvj.com
Brad Adams, PE	Mobile LiDAR Specialist	(972)768-7393	badams@espassociates.com

Unique Qualifications of the RAS Team

The RAS team is comprised of established industry veterans who have dedicated their careers to the field of pavement and asset management. RAS team members have performed over 200 pavement and asset management projects in the last 5 years in accordance with ASTM D6433 and AASHTO R 57, and do not anticipate any challenges or risks. RAS offers member agencies of NCTCOG and those participating in this contract across the Country the most experienced data collection team to provide assurance that the collection and quality processing of data will be delivered on schedule. We have an outstanding record of completing projects of ranging in size from 50 miles to 5,000 miles, on time and within budget. The RAS team advantage is as follows:

- **Municipal Texas Experience** – RAS specializes in PCI studies and pavement modeling techniques for municipalities around the Country. The RAS team has managed or is currently assisting the following Texas municipalities in pavement or ROW asset inventories: Denton, Rockwall, Rowlett, Burleson, Greenville, Austin, West Lake Hills, New Braunfels, Kyle, Amarillo, Galveston, Corpus Christi, Hutto, Pflugerville, Forney, Seguin, and Central Texas Regional Mobility Authority.

- **Unsurpassed Local Knowledge** – A unique feature of the RAS team is our local presence and local knowledge. Scot Gordon recently served as President of the ACEC Tarrant County Chapter and was the Senior Pavement Design Engineer at Kleinfelder. This experience enabled Scot to become familiar with the local roads, local paving materials, and soil conditions. He will be actively involved in daily pavement distress evaluations and QA/QC of the data as it is received. This starts with the pilot data review and onsite field validation that RAS conducts on all assignments. Mr. Gordon will meet with the agency's staff to review the results, discuss the details of the evaluation to field verify the measured distresses, and answer any questions that may arise.

Proprietary Information

Due to his local presence, Mr. Gordon can also be available for last minute onsite meetings or discussions. Should any of the data seem in conflict with the local conditions, Scot will field review the data and resolve the final data/report with in-field observations/measurements based on his extensive local knowledge regarding distress manifestations. His knowledge of paving materials and construction techniques, coupled with the experience to establish a workable maintenance plan with available funding, sets the RAS team apart.

- **Mobile LiDAR and Static Scanning-** The RAS team's advanced remote sensing services offer increased safety and speed of acquisition for a wide variety of topographic mapping, asset extraction and 3D modeling and visualization. This remote collection technology provides value for the NCTCOG member cities through speed of collection, completeness of the data set, and increased safety for field personnel and the public. Our team has five mobile lidar systems, providing the NCTCOG member cities with ample resources to meet project schedules. With a single mobilization from Dallas, the RAS team's mobile lidar scanning system(s) can collect all topography and bridge features, structures, paint striping, etc. while driving posted speed limits. This complete data set will be available for future data mining needs without additional costly or disruptive onsite activities. The cost savings of mobile lidar versus conventional surveying activities is significant, including lower mobilization costs, increased speed of collection, and added value deliverables.
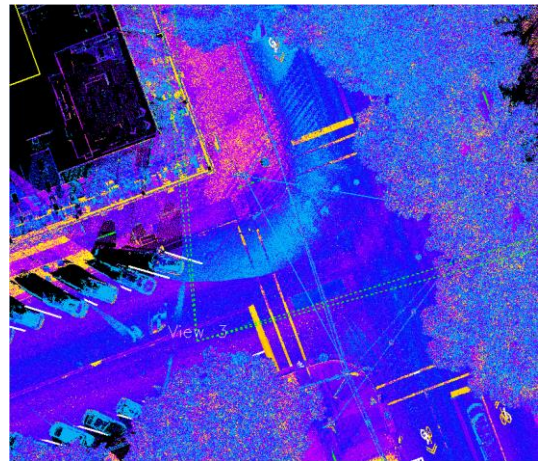
- **Delivery of Imagery** – RAS views all imagery from the condition assessment as pertinent to an agency's quality assurance measures and final acceptance of the data. As such, RAS will deliver all 5 panoramic ladybug image views and the downward LCMS roadway images as a part of the image deliverable associated with this contract. They will be delivered on a hard drive with an associated Personal Geodatabase or uploaded to the RAS' web hosted video logger if selected by the participant.

- **Field Pilot** – The importance of the field pilot cannot be understated as it has become a routine milestone for the RAS Team on all pavement condition projects. The pilot allows RAS to collect, process, and review condition data with an agency's staff to ensure accuracy with the data collection and interpretation protocols. This same pilot was performed by Scot Gordon during the following projects: Fort Worth, Harris County, Houston, San Antonio, Corpus Christi, Burleson, Greenville, Denton, Rockwall, Hutto, Kyle, TX.

- **Local DBE Partnership** – To ensure equality in the administration of projects, RAS has teamed with HVJ Associates to conduct structural analysis and friction testing. **HVJ is a certified small business enterprise (SBE), DBE, MBE, HUB, and is registered by the Texas Board of Professional Engineers (Registration No. F-000646).** RAS views partnerships with Historically Underutilized Businesses as central to increasing diversity and continued advancements in the field. As such, RAS has partnered with HVJ on the following pavement and/or ROW data collection projects: Austin, Corpus Christi, and Forney, TX.

2. Texas Registrations and Equipment Certifications

RAS is registered with the Texas Board of Professional Engineers and Land Surveyors and operates under registration number F-22104. In addition, Project Manager, Scot Gordon is a licensed Professional Engineer (88099) in the State of Texas. To provide agency's within NCTCOG objective and defensible data, RAS' **Class I Inertial Profiler has also been independently certified from Texas A&M Transportation Institute (TTI) in July of 2022.**

Model: ICC IRIS PRO PAVE
S/N: T4243100
VIN: IFB3X2ZM8KKA05530
Test Date: 7-11-2022

3. Description of Services and Capability to Provide the Proposed Scope

The following list demonstrates RAS competency in performing pavement and ROW asset condition assessments for a wide range of municipalities. The benefit of contracting with the RAS team is that we are solely dedicated to pavement and asset management. This is our core focus as transportation professionals.

Project	Test Miles	Client Name	International Roughness Index (IRI)	Pavement Evaluation	Pavement Condition Index	GIS Segmentation	ROW Asset Inventory	Pilot Program and Field QA/QC	Deterioration Curves and Modeling	PMS/AMS Integration	System Training
Pavement Data Collection	5,000	Arizona DOT	X	X	X	X					
Pavement Condition and ROW Asset Survey	4,548	Albuquerque, NM	X	X	X	X	X	X	X	X	X
Pavement Data Collection	3,750	Austin, TX	X	X	X	X		X	X		
Traffic Sign Data Collection	3,750	Austin, TX				X	X	X			X
Pavement Condition and ROW Asset Survey	3,340	Charlotte, NC	X	X	X	X		X	X		X
Pavement Data Assessment	3,086	Denver, CO	X	X	X	X	X	X	X	X	X
Pavement Condition Survey	3,048	Memphis, TN	X	X	X	X		X	X	X	
Pavement Condition Survey	2,248	Pima County, AZ	X	X	X	X		X	X		
Pavement Evaluation and ROW Asset Services	1,594	Corpus Christi, TX	X	X	X	X	X	X	X	X	X
Pavement Condition Assessment	1,500	Sarasota County, FL	X	X	X	X		X	X	X	
Street and Alley Assessment	1,362	Amarillo, TX	X	X	X	X		X	X		
Pavement Condition Assessment	1,097	Mesa County, CO	X	X	X	X	X	X	X	X	X
Pavement Condition Survey and ROW Asset Inventory	1,023	Durham, NC	X	X	X	X	X	X	X	X	X
Pavement Condition Survey	1,012	Douglas County, CO	X	X	X	X		X	X	X	X
Pavement Management and Street Assessment	950	Tallahassee, FL	X	X	X	X		X	X	X	X
Pavement Condition Survey	730	Salt Lake City, UT	X	X	X	X		X	X	X	X
Pavement Condition and Inventory Survey	608	Greenville, SC	X	X	X	X	X	X	X	X	X
Pavement Condition Assessment	501	Grand Junction, CO	X	X	X	X		X	X	X	X
Pavement Condition Survey and ROW Asset Inventory	460	New Braunfels, TX	X	X	X	X	X	X	X	X	X
Pavement Condition Assessment	397	Galveston, TX	X	X	X	X	X	X	X	X	X
Pavement Condition Survey	360	Greenville, TX	X	X	X	X	X	X	X	X	X
Pavement Condition Assessment	327	Rowlett, TX	X	X	X	X	X	X	X		
Pavement Condition Survey	310	Burleson, TX	X	X	X	X	X	X	X		
Pavement Condition Assessment	288	Rockwall, TX	X	X	X	X	X	X	X	X	X
Pavement Data Collection	286	CTRMA	X	X	X	X	X	X	X		

Texas Experience

The adjacent illustration demonstrates the extensive Texas experience that the RAS leadership team has from working with the cities and counties represented on the map. While RAS works with agencies around the Country, we are proud to be incorporated in the State of Texas and even prouder to call Texas home. Throughout their careers, the RAS Executive Team has managed each of these projects as it relates to automated data collection, PCI processing, pavement modeling, and multi-year plan development.

Texas Soil and Pavement Experience

The RAS Team is comprised of engineers and industry experts who have conducted pavement inspections across the country and spent their careers interpreting distress manifestations on asphalt and concrete pavements alike. It is this experience, combined with a sound engineering design background, which allows RAS to discuss design remediation techniques when desired by our clients.

Our team of engineers also understands some of the difficulties in maintaining pavements due to the numerous variables that affect pavement performance. These variables range from clays and silts with high moisture sensitivity, often resulting in a reduction in

support strength, to sands and gravels with very good structural support for pavements. The various soil regions should receive consideration when evaluating and assessing deterioration curves and treatments within various regions of Texas. The RAS team members will work with the NCTCOG agencies to evaluate the conditions and PCI ratings for assessing funding needs and providing documentation/models for the evaluation of future performance and maintenance needs.

Texas also presents extreme environmental challenges with intense UV rays aging the asphalt, and high temperatures softening the asphalt during the summer. We have observed several areas of aging due to weathering, thermal cracking, and block cracking, indicating a large environmental effect on the performance of pavements in this area. These areas indicate a need for early preservation and maintenance to protect the flexible properties in the asphalt cement. We have observed historically treated streets with surface seals designed to preserve the pavement and provide a high friction wearing surface. These treatments also present challenges in high temperatures due to the tendency of bleeding of the asphalt if the application rates are not proper. We will work with the NCTCOG agencies to determine the most effective way to rate these pavements with recent seals to represent the true condition and not just what is observed on the surface.

The RAS team also understands how moisture and poor drainage can significantly decrease the subgrade support, specifically in silts and clays. We can work with agency staff to enhance "performance" districts/regions to better model deterioration rates and improve the predicted performance of a given area. Knowledge of the softer subgrade regions, along with the environmental aging factors, will help us understand where maintenance may be needed sooner to prevent more costly deterioration. The moisture susceptible silts have the greatest propensity to lose support strength; thus, causing more cracking and subgrade failures, requiring different treatments than the more stable sand-based subgrades. These regions of silt soils also should be modeled for more rapid deterioration with steeper deterioration curves.

4. Pending Lawsuits
The RAS Team has never been involved in a lawsuit and has no pending cases.

5. Claims Against RAS
The RAS Team has never had a claim submitted by a client.

Proprietary Information

Tab D: Technical Proposal

Tab D: Technical Proposal

Technical Expertise

The RAS Team is comprised of industry experts and professionals who have a tremendous amount of experience in managing municipalities of varying sizes ranging from 50 miles to 5,000 miles. The benefit of RAS on this assignment is that the team is dedicated to asset and pavement management on a daily basis and we have a wide range of experience working throughout the County, in addition to the Dallas-Fort Worth Metroplex. This is their core focus as transportation professionals, and they stand ready to assist agencies within NCTCOG.

1. Description of Services for which the Respondent will Provide

As dedicated consultants in the pavement and asset management industry, the RAS team is responding to all service categories listed in the NCTCOG solicitation and further details for each service category will be illustrated in this technical section of the proposal starting in Section #4. The services categories discussed further in this technical proposal are as follows:

- **Service Category 1: Pavement Data Collection**
- **Service Category 2: Asset Inventory**
- **Service Category 3: Pavement Management Analysis**
- **Service Category 4: Electronic Products**
- **Service Category 5: Pavement Structural Analysis**
- **Service Category 6: GIS Related Services**
- **Service Category 7: Value Added Services**

2. Description of the Respondent's Process for Responding to an Order for Services

Following participant engagement, RAS will schedule a meeting with agency staff to discuss the agency's required scope of services and additional offerings RAS can provide as a part of the NCTCOG contract. Once the scope elements have been defined, RAS will develop a detailed project budget using the NCTCOG form that RAS has submitted as a part of this submission along with a timeline detailing milestones and key deliverables. When the contract is finalized with the participating entity, RAS will report the contract to NCTCOG for project tracking and financial renumeration.

The RAS executive team has been involved with numerous projects that have leveraged the legacy NCTCOG contract and understands the contractual obligations required through its use.

3. Automated Systems

RAS has invested in the most sophisticated fleet of Roadway Asset Collection (RAC) vehicles and pavement analysis tools for automated data collection that provides a true **100% linear assessment** of the roads driven. This methodology removes the subjectivity of rating small sample areas of the road segment and harnesses the power of 21st century technological innovation. Unlike many other consultants, RAS utilizes a ROW capture system to provide an **immersive 360 panoramic view** versus stationary independent camera views.


Proprietary Information

Furthermore, RAC vehicles have received independent inertial profiler certification for accuracy and repeatability from Texas A&M Transportation Institute (TTI) in July 2022. **RAS has a fleet of 4 RAC vehicles** to ensure that we have available data collection equipment to meet each agency's data collection schedule requirements.

In addition to the RAC vehicles, the RAS service offerings also includes the ability to capture and extract LiDAR data using a Reigl VMX-1HA, Two Trimble MX8, a Trimble MX9, and a Leica Pegasus Two Ultimate. For further structural analysis elements, the RAS service offerings include the use of a Falling Weight Deflectometer (FWD) and Ground Penetrating Radar (GPR) to supplement the surface condition assessment offerings. For an expansive look at equipment specifications, please refer to page 24 of the proposal submission.

While any qualified contractor can collect some form of pavement condition data using automated technology, the key component to project success is in the software utilized to interpret the automated sensor data. In addition to the automated hardware use for data collection purposes, RAS also utilizes an automated distress analysis software called **RoadTRIP™** (Technical Rating Intelligence Program). This software consumes the detailed LCMS files, quantifies the individual distress elements by extent/severity densities, and calculates a segment level PCI score using ASTM D6433 deduct curves and Q-corrections. **RoadTRIP™** is also used as a quality assurance tool with programmed automated scripts as well as viewing modules for the RAS Project Engineer and QC technicians. **RoadTRIP™** was programmed with sophisticated algorithms that use sound geometry and distress density to properly classify and quantify pavement distresses. In addition to the **RoadTRIP™** engineered ASTM D6433 algorithm's, the application is also supplemented with Artificial Intelligence and Machine Learning for the identification of edge of lane, patching, brick crosswalks, road debris such as leaves, and other such events. RAS approach to automated data processing is defined on page 18 of this proposal submission.
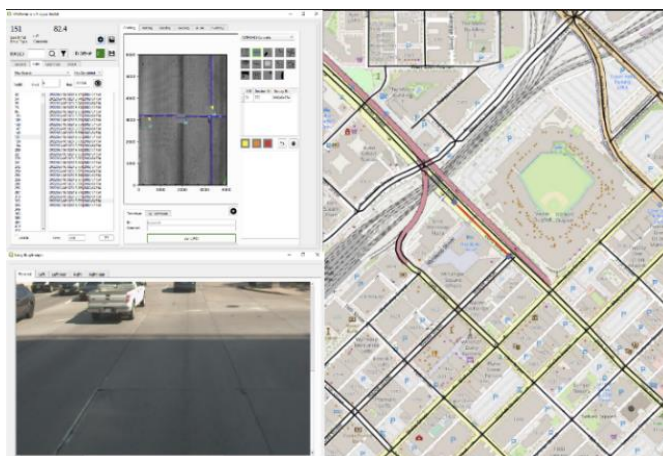
4. Project Understanding and Approach
Project Understanding Summary
RAS understands NCTCOG is seeking a qualified vendor to provide pavement analysis, right of way asset inventories, budgetary modeling, structural assessments, and related services. RAS will conduct Pavement Data Collection Services (Service Category 1) and the Asset Inventory (Service Category 2) utilizing an automated Roadway Asset Collection (RAC) vehicle. The RAC vehicle is equipped with a Second-Generation Laser Crack Measurement System (LCMS-2) for 2D and 3D images of pavement distresses, a Ladybug 360-degree camera for panoramic views of the Right-of-Way (ROW), and a Class 1 Inertial Profiler that has been independently certified by the Texas A&M Transportation Institute (TTI) for full lane rutting and roughness.

RAS conducts a pavement analysis (Service Category 3) utilizing an agency's existing or selected pavement management software software. If an agency has no preexisting pavement management software and does

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not require a third-party/proprietary system, RAS will use its internal **BOSS™ (Budget Optimization Street Selector)** software for the development of performance models, multi-year and multi-constraint rehabilitation plans, and budget scenarios. There is no "one size fits all" software solution for our clients and RAS differentiates itself by committing to assist our clients in the selection of software that truly meets their needs instead of the needs of the selected consultant. The RAS team retains this diverse flexibility due to our wide-ranging experience across the Country that has resulted in the RAS implementation of programs such as Cartegraph™, Streetlogix™, PAVER™, Trimble's Pavement Express™, Decision Optimization Technology (DOT)™, Brightly's Capital Predictor™, CentralSquare™, StreetSaver™, Custom Spreadsheets, Microsoft PowerBI™ Dashboards, and many others.

Service Category 1: Pavement Data Collection Equipment

The pavement data will be processed per road segment for the entire roadway network using the continuous and detailed 20-foot linear samples acquired by the Laser Crack Measurement System (LCMS-2). RAS will adopt the agency's existing GIS centerline and the detailed data collected by the RAC van will be rolled up to the segment level for PCI condition reporting purposes. IRI and Roughness Index (RI) values will be provided for all street functional classifications in accordance with the AASHTO R 57. In addition to pavements, RAS can conduct a bridge deck condition assessment utilizing the RAC vehicle's LCMS-2 imagery and ASTM testing protocols. The segment will be given a unique segment ID classifying the road as a bridge deck and evaluated as concrete.

While the RAC vehicles are capable of surveying every lane for maximum sample coverage, generally two passes on the arterial and collector roadways (once in each direction) is more than sufficient, coupled with a single pass on local roadways. RAS would process 100% of the linear LCMS 20-foot samples to ensure the most objective assessment possible.

To complete the automated pavement condition survey, the RAS team will utilize RAC vehicles from the fleet of four (4), equipped with:

- The LCMS-2 camera is a downward-facing laser array providing images used to evaluate data that conforms with ASTM D6433 protocols, which uses **two 1-millimeter-pixel** resolution line scan cameras to **provide a customized digital condition rating system to collect user defined severity/extent-based pavement distresses. The collection system is able to capture 3D imagery of full lane width, rutting, roughness, patching, distortions, raveling, bleeding, and cracking.** With one-millimeter horizontal resolution (equivalent to 4,000 laser points), the two-sensor LCMS device far exceeds the minimum requirement of 4, 7, or 9 independent laser sensors.

- Point Gray Ladybug 5+ 32MP **360-degree High-Definition camera** (**utilized for accurate ROW asset capture, extraction, and pavement QA/QC**) is far superior to multiple independently mounted HD cameras. RAS will deliver the HD images to the agency for review and acceptance.

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- A class 1 inertial profiler for simultaneously capturing dual-wheel path (left and right) International Roughness Index (IRI) measurements to the hundredth inch, in accordance with AASHTO R48. The profiler has gone through **ASTM E-950** certification and **has been independently certified by Texas A&M Transportation Institute (TTI) in July 2022.**

- Applanix POS/LV with DGPS (**Provides accurate internal GPS navigation for geo-locating pavement and right of way asset information**).

The RAS team will conduct pavement survey work on dry pavement and in lighting conditions that ensure accurate crack detection. We will collect imagery during daylight hours only, with no rain, fog, or snow visibility obstructions. Any road segment(s) that exhibits low image quality due to lighting will be recollected at a later time. The industry is currently migrating toward automated rating with Project Engineer Quality Assurance for 100% linear assessment of the roads, in accordance with guidelines within the **ASTM D6433, ASTM E1656, and ASTM E3303**. This methodology removes the subjectivity of rating small sample areas of the road segment where the sample may not represent the condition of the entire roadway segment.

Service Category 2: Asset Inventory Equipment
Ladybug 360 Degree Camera

All collected pavement and ROW imagery will be provided in appropriate state plane coordinates, while being collected in one continuous pass on residential roads and two pass testing arterial and collector roads. **The images will be collected as a 360-degree right-of-way panorama, including forward, rearward, and downward pavement viewing images.** All 5-views of Ladybug imagery will be processed in 20-foot intervals along with the downward LCMS for the RAS QC program and for photogrammetry right of way asset extraction activities. The imagery can be delivered in .jpeg format, on a hard drive, associated with a Personal Geodatabase, and/or web-hosted image and data viewing application designed to consume the detailed right of way and pavement imagery. Each image will be electronically tagged with location information for plotting within a spatial environment and delivered via a shapefile (.shp).
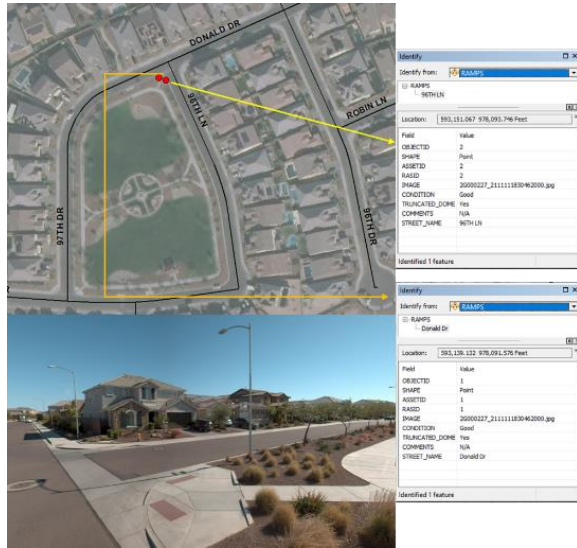
The HD images can be post-processed using RAS software to collect attributes for each asset type captured.

For example, a **sidewalk inventory** typically consists of extracting the following attributes: AssetID, street name, X,Y location, photo image, physical condition (good, fair, poor), width, length, location in relation to curb, greenspaces between curb and sidewalk, and existent (yes/no). **Sidewalk obstructions** are typically inventoried with the following attributes extracted: AssetID, X,Y location, photo image, and sidewalk obstruction type (i.e. fire hydrant, utility box, severe cracking, wide gap, and many others).

Barrier-free ramps are typically extracted for the following attributes: Asset ID, X,Y location, photo image link, physical condition rating (good, fair, poor), and truncated dome. RAS commonly captures the following attributes for **ADA ramps**: AssetID, X,Y location, intersection, corner (NW, SW, NE, SE), ramp exists (Yes/No), ramp orientation (bidirectional, diagonal, unidirectional), ramp type, photo image link, physical condition rating (good, fair, poor), and truncated dome (Yes/No).

Traffic signs, which are listed as a point feature, are commonly captured with the following attributes: AssetID, X,Y location, sign type (MUTCD code), sign text, photo image link, physical condition rating (good, fair, poor), location, support structure type, sign direction, and comments.
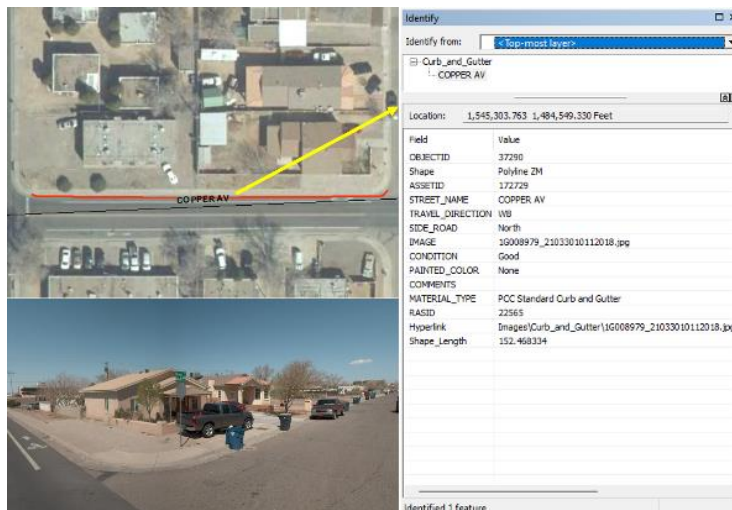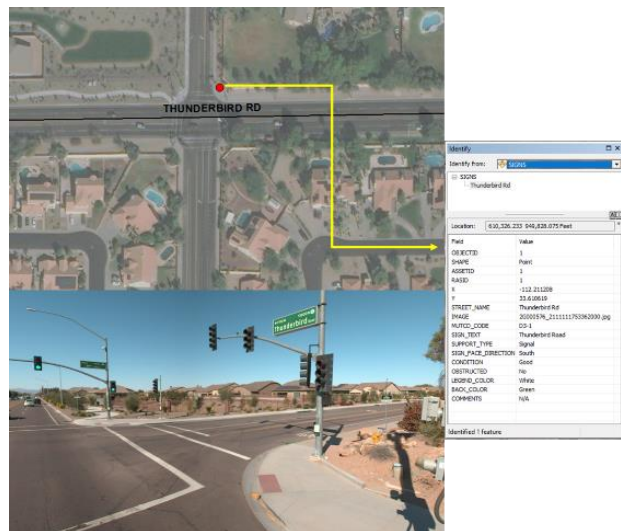
Curb and gutter are commonly captured with the following attributes: AssetID, location, photo image link, travel direction, side of the road, physical condition (good, fair, poor), painted color, material type (brick, limestone, concrete, valley or roll), and comments.

Bike Lanes are typically captured with the following list of attributes: AssetID, location, photo image link, physical condition rating (good, fair, poor), length, width, signage, and comments. **Trees** are commonly captured with the following attributes: Asset ID, X,Y location, height, and spread.

Lane Striping/Pavement Markings Retroreflectivity is evaluated in accordance with the Federal Highway Administration (FHWA) standards. The purpose of this study is to reduce transportation-related fatalities that occur during nighttime as incident rates are 3 times higher at night than at day. RAS will conduct this study utilizing a nighttime visual inspection methodology. The method involves a nighttime review at highway speeds with low-beam headlamps by an inspector who is aged 60 years or older. The trained inspector judges the adequacy of the markings to meet his or her nighttime driving needs.

The RAS asset extraction system is not limited to the assets identified above as we can inventory and extract attributes on nearly any asset that can be identified in the images. Other common roadside features for capture include traffic signal inventory, streetlight inventory, fire hydrants, bus stop shelters, medians, pavement markings, pavement striping, drop inlets, speed humps, cabinets, utility poles, medians, manhole covers, culverts, cattleguards, and many others.

Ground Penetrating Radar for Relocating Utilities: 3D GPR

The RAS team available services includes the use of an ImpulseRadar Raptor®, a FCC-certified high-speed 3D GPR array system. When the 3D Raptor system is deployed for data collection, site topographic information can be used to assign approximate elevations to the subsurface utilities detected. The system is the first GPR array to incorporate real-time digital sampling technology that allows the collection of 3D GPR data at posted highway speeds.

The advanced digital technology provides increased depth penetration in most soils and a large bandwidth facilitates greater resolution of utility and other targets. The data is then integrated into ESP's 3D underground utility mapping software. In some cases, depth information collected using single-channel GPR and radio frequency EM pipe and cable locators can also be incorporated. The resulting deliverable is a reconstructed 3D image of detected utilities and other structures that is a fully maneuverable and living 3D model. When appropriate, adding this dimension to utility and utility coordination deliverables can provide a complete illustrative view of proposed utility relocations for stakeholders. With its ability to map large areas quickly, it can be a great benefit for busy job sites, often eliminating the need for traffic control. The goal is to reduce overall project costs by mitigating unforeseen utility conflicts and reducing the need for test holes. The Raptor, coupled with RAS's rigorous approach to using all available technology, is ready to offer 3D GPR solutions to the NCTCOG member cities.

Service Category 3: Pavement Management Analysis

After data is collected in the field and uploaded to the office environment, it is imported using the RAS AI enhanced pavement rating tool **Road TRIP™ (Technical Rating Intelligence Program)**. The import process creates mappings to the data so that users do not need to keep track of where the data is stored on central data server(s). At this stage, the major data processing tasks also occur, such as generation of right-of-way and pavement image streams; calculation of profile, roughness, rutting, detection of cracks, lane-markings, man-made objects, and other distresses. The **RoadTRIP™** application was designed around the ASTM D6433 data collection protocols and contains a **PCI calculator** that uses the ASTM D6433 distress deduct curves and Q-correction. **RoadTRIP™** was programmed with sophisticated algorithms that use sound geometry and distress density to properly classify and quantify pavement distresses. In addition, **RoadTRIP™** is a highly customizable and "open architecture" data processing application that has also been configured for unique rating protocols such as TXDOT, dTIMS, FHWA SHRP LTPP, and could also be configured to accommodate unique condition indices used for participating member agencies.
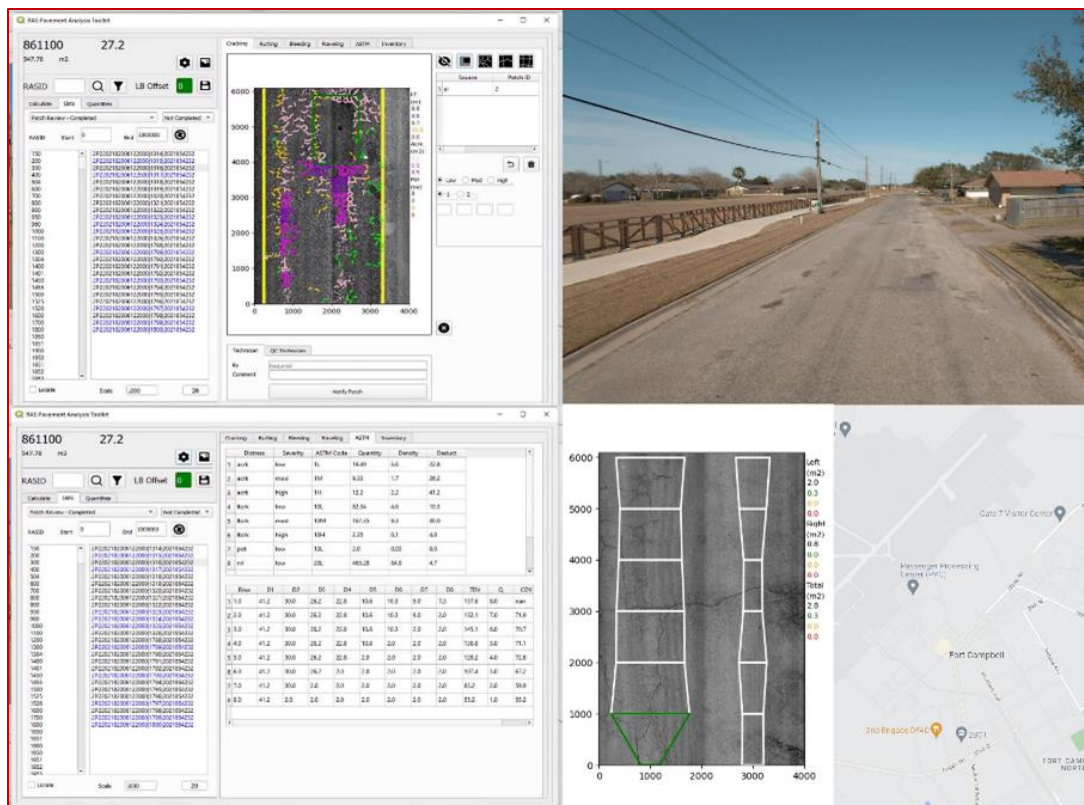
IRI Calculation

RAS has extensive experience utilizing and reporting data per the ASTM E950, ASTM E3303, and ASTM D6433. IRI (International Roughness Index) data is collected using surface profiling systems which meets ASTM E1926 standards and has been independently certified by TTI in July 2022. RAS utilizes the ASTM E1926 for computing the IRI from longitudinal profile measurements. The profiler uses infrared lasers and precision accelerometers to obtain accurate and precise profile measurements at speeds up to 65 mph. Calibration of the laser profiling system includes laser sensor checks and block tests to ensure the accuracy of the height sensors, accelerometer calibration "bounce tests" to verify proper functioning of the height sensors and accelerometers, and distance calibration to ensure accuracy of the DMI. Calibration of the DMI and some accelerometers occurs during field testing, and each is recalibrated on a regular basis.

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Pavement Management Software Expertise

Software selection and implementation should be about the needs of the end user (agency staff) and not the selected consultant. As a full-service asset management consultant, RAS is software agnostic due to the wide-ranging needs of our clients across the Country. With this vast experience in software implementations, RAS commonly implements applications such as custom Microsoft PowerBI dashboards, custom spreadsheets, Cartegraph, PAVER, Streetlogix, Stantec's RoadMatrix, Trimble's Pavement Express, Decision Optimization Technology (DOT), Brightly, and VueWorks. We are also commonly asked to help our clients evaluate the available software solutions and assist them in selecting an application that truly meets their implementation and budgetary needs. To demonstrate our proficiency in third-party pavement management software, RAS has provided a sample listing of clients that required data configuration, implementation, and/or analysis work within the respective software solution.

PMS/AMS Solution	Client
BOSS	Albuquerque, NM
	Salt Lake City, UT
	Galveston, TX
	Pflugerville, TX
	Hutto, TX
	Boerne, TX
	West Lake Hills, TX
	Levelland, TX
	Durham, NC
	Clarksville, TN
	Anderson County, SC
	Worcester County, MD
	Greenville, SC
	Pennington County, SD
	Cheyenne, WY
	Fountain Hills, AZ
	Frederick, CO
Cartegraph	Corpus Christi, TX
	Burleson, TX
	New Braunfels, TX
	Denton, TX
	Forney, TX
	Salt Lake City, UT
	Denver, CO
	Virginia Beach, VA
	Frederick, CO
	Anderson County, SC
	Kingsport, TN
	Mesa County, CO
	Sarasota County, FL

PMS/AMS Solution	Client
VUEWorks	Albuquerque, NM
	CTRMA, TX
	Rochelle, IL
	Amarillo, TX
	Galveston, TX
	Rowlett, TX
	Sioux Falls, SD
PAVER	Lewisville, TX
	Rowlett, TX
	Rockwall, TX
	Wolfforth, TX
	Clarksville, TN
	Durham, NC
	St. Ives Country Club, GA
	Ft. Campbell, KY
CityWorks	Durham, NC
	Charlotte, NC
Lucity	Grand Junction, CO
	Coconino County, AZ
	Yuma, AZ
Streetlogix	Memphis, TN
	Seguin, TX
	Montgomery County, TN
Brightly	Pueblo, CO
	Topeka, KS

Pavement Management Software (PMS) Options
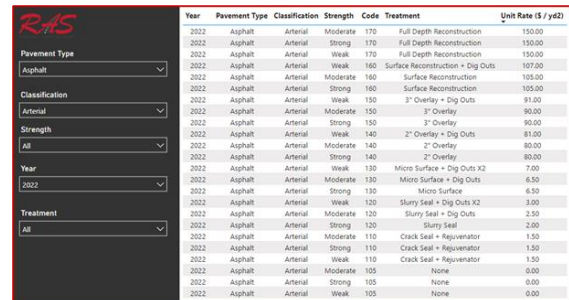
If an agency does not have an existing PMS and wishes to utilize vendor software, RAS can utilize its own pavement management software, **BOSS™**, for the development of budget scenarios, maintenance and rehabilitation plans, custom deterioration curves, and financial optimization using "cost of deferral" analysis. **BOSS™** is an ESRI compatible, cloud-based application with powerful pavement management algorithms behind it, that is capable of exporting the results of the pavement analysis to a user friendly interface such as **Microsoft PowerBI, ESRI storyboard maps, or Excel spreadsheets.**

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BOSS™ is a fully functioning pavement management program that integrates an agency's segment level GIS centerline's, develops real world and actionable projects, runs budgetary models, forecasts to establish trends, financially optimizes the multi-year plan using sound "cost of deferral" constraints, and produces a final 5 or 10-year maintenance and rehabilitation plan for review.

RAS will work with the agency's staff to establish the maintenance and rehabilitation activities, PCI trigger points, costs, decision trees, reset PCI values, completed rehabilitation work since the survey, planned work, existing budgets, pavement deterioration curve development/assignment, and inflation priorities. Project Manager Scot Gordon and Assistant Project Manager Zac Thomason will assist staff with determining the right treatment (prescription) at the right time by reviewing the agency's existing maintenance and rehabilitation strategies and recommending others that may be a good fit. The scope will include developing at least 10 profile budget runs to establish the budget model trend and 5 or 10-year pavement analysis.

The RAS analysis involves the following sequences and client engagements during the process:

- **Current database review** – most issues can be resolved at the initiation of a project by completing a brief review of the agency's existing GIS. Any recommended changes to the segmentation or budgetary model configuration will be discussed during this stage.

- **Maintenance & Rehabilitation Setup** – to ensure the results of the budget model runs meet the agency's expectations, RAS will discuss the current Maintenance and Rehabilitation operation and recommend updates. Scot is well versed with the application of pavement rehabilitation techniques, Min/Max PCI, Breakpoint PCI, decision trees for treatments, costs, real-world impact to PCI, reset PCI values, and life cycles. As a part of this process, RAS will work with the agency to determine the right treatment (prescription) at the right time.

In addition, the RAS analysis retains the ability to use the density of load associated distresses to trigger additional structural patching or an entirely different rehabilitation activity. For example, segments that have greater than a 10% density of load related distresses are generally catagorized as weak, with moderate strength between 2%-10%, and strong less than 2% density.

- **Deterioration Curves** – forecasting pavement conditions requires a detailed set of pavement deterioration curves for each roadway traffic classification, pavement material type, and strength rating as designated by the pavement management system. Scot will review the existing deterioration curves to ensure they reflect realistic degradation rates in the agency. If alterations to the curves are necessary, Scot will lead the update with the

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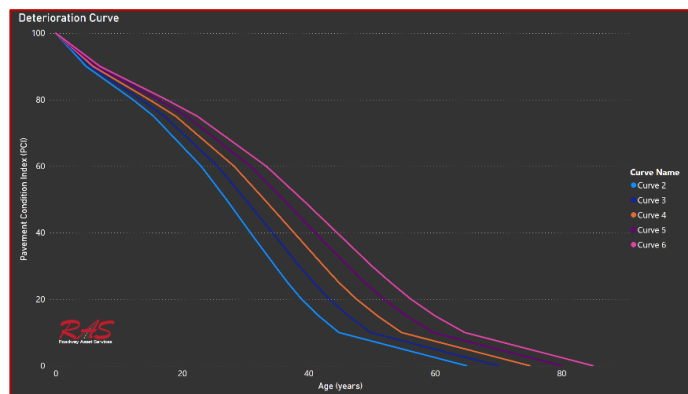
team. Scot Gordon has developed hundreds of deterioration curves based on collected data. Scot will work with the legacy data along with the collected data from this project, to develop updated and further refined deterioration curves for each combination of street classification and pavement surface type, representative of the climate.

- **Project development** – the RAS analysis includes stitching segments (blocks) together to form a logical project, also known as a "management section" or "supersegment". RAS will work with agency staff to review the initial model results and begin "stitching" segments together to form logical projects that best meet the needs of the agency. The benefit of utilizing management sections is that the RAS analysis runs the budgetary scenario at the project level, producing real-world rehabilitation plans that are ready for review, modification, or action. Our team

will also provide recommendations for best practices in developing practically sized management sections to yield model results that can be acted upon. A Microsoft Access database of final configuration, setup, model, etc. will be provided to the agency. In addition, independent projects can be linked to trigger at the same time, allowing for two different rehabilitation activities to take place within a single subdivision if desired.

- **Financial Optimization & Prioritization** – RAS' analysis uses sound engineering and economic logic to prioritize which street candidates are selected throughout the multi-year plan. While most pavement management programs will prioritize by roadway traffic and condition, an RAS analysis takes it a step further and introduces financial optimization into candidate selection through the use of a "Need Year" analysis that identifies each segment's cost of deferral. Understanding the "Cost of Segment Deferral"

allows the analysis to maximize the agency's limited funds in the best manner possible. As seen in the adjacent image, the RAS Microsoft PowerBI Dashboard outputs several graphics that illustrates where the agency's funds are being spent and how many "critical" selections were actually achieved. Critical roadways are simply those that are within 2-4 PCI points of dropping into the next rehabilitation activity.
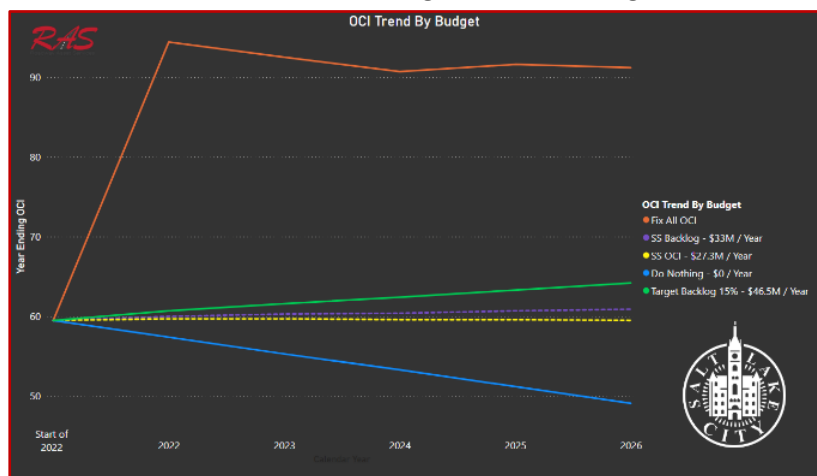
Budget Model Development

The RAS Team separates itself from our competition through our devotion to the most critical aspect of the project, which is collaborating with an agency on how to take the objective condition data and utilize it to make meaningful decisions involving the agency's infrastructure.

RAS follows the "AASHTO Transportation Asset Management Guide – A Focus on Implementation" which provides a framework for organizations to utilize and update the management of their assets to improve decision-making, monitor performance, and support integrated decisions in programming projects. The observed distresses and calculated PCI values will be used within the RAS analysis to rank projects using distress types indicating load, non-load, and environmental related causes of each distress.

Running budgetary models within a pavement management system requires a deep understanding of the database structure behind the application. The RAS approach to budgetary modeling will involve up to 10 pavement management scenarios using different philosophies, budget levels, and distributions. While **RAS will define the scenarios to be run with agency staff, at a minimum the following questions should be answered with the scenarios:**

- What will the overall average pavement condition be if current funding levels remain unchanged for the next three, five, or ten years?
- What funding will be necessary on an annual basis to ensure an average overall pavement condition of 65, 70, 75, or 80 PCI?
- What budget is required to maintain my existing network PCI?
- What budget is required to control the growth in backlog?
- What are the recommended pavement strategies?

RAS will also consult with agency staff to develop models utilizing different types of rehabilitation strategies (worst first, best first, most economic, need year, etc.). RAS understands that getting buy-in from Agency Administrators and Elected Officials means developing a long-range rehabilitation plan that considers local priorities. The RAS team will ensure that already approved rehabilitation work is

programmed into the budgetary models for selection during the run. In addition, RAS will consult with agency staff to identity the total cost (mill, overlay, traffic control, striping, etc.) of each rehabilitation method.
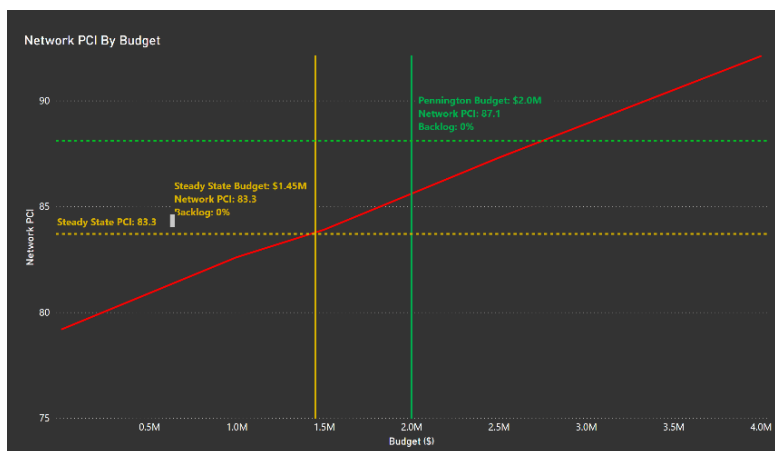
Infusing Innovative Multi-Constraint Optimization into the Analysis

Optimization is a broad-based term that has many different definitions. For most pavement management systems, optimization is the ability to prioritize a multi-year rehabilitation plan using several different

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factors that are important to an agency and based on sound engineering constraints. To further enhance upon optimization, Project Manager and Senior Pavement Engineer, Scot Gordon looks forward to visiting with City staff on other **innovative considerations** to pavement management such as **including PCI of curb and gutter in selecting roads for maintenance; whether or not to deduct for potholes if the City has a pothole repair crew; how to get all council districts above a specific PCI threshold; and focused analysis on top traveled corridors where you are improving the level of service on the roads receiving the greatest traffic while also analyzing the impacts to the remainder of the network.**

For example, Scot performed additional analysis scenarios for the City of San Antonio to identify variable funding needs to achieve and maintain the set goals for each Council District (minimum PCI of 70), based on pavement condition performance. To accomplish this, Mr. Gordon worked with the City to determine the proper mix between preservation and reconstruction within each of the 10 Council Districts to achieve the minimum baseline number of a PCI of 70 per district.

For example, in the City of Fort Worth, Scot worked with City Staff to incorporate curb and gutter as a factor in street selection for maintenance. In addition, the previous evaluation deducted for potholes in their PCI score, while the most recent survey reversed this decision as their crews were repairing these distresses daily and a preference to not have potholes influence the PCI value were expressed.

For the City of Durham, North Carolina we used the most recent census data and the City's Federal Information Processing Series (FIPS) codes to review social-economic factors such as median household income and racial diversity to further factor optimization to ensure equal spread of street maintenance across the City.

Each of the examples above were combined with sound financial optimization that allowed for a truly customized multi-year plan that met the needs of local constituents, elected officials, and City staff.

Service Category 4: Electronic Products

RAS views imagery from the condition assessment as pertinent to an agency's independent quality assurance protocols. As such, RAS will deliver the LCMS-2 imagery and all 5 panoramic views from the Ladybug 360 camera in 20-foot intervals on a USB or the RAS Video Logger. In addition to loading imagery for the agency's ownership, RAS will format data for ingestion into an existing or newly adopted pavement management system. The participating organization will receive data in multiple formats such as ESRI Geodatabase, Google Earth KMZ file, Microsoft Excel spreadsheet, and a hard drive with GPS coordinates to support data consumption in a variety of environments and interfaces.

Basic inventory attributes such as those defined in item 28 a. through i. are all standard elements provided to an RAS client upon delivery of the final pavement database. Pavement widths are measured using aerial photography with measurements taken and logged at every visible width change. At a minimum, each segment will receive several width measurements such that an average width per segment can be calculated.

RAS Video Logger/Map Module

RAS can provide agencies with the RAS Video Logger which is a web hosted full-service image viewer that allows our clients to select a section of roadway from the GIS-based map module to visually display the inventory elements and the results of their survey. The viewer is hosted on a reliable web platform. The RAS Video Logger allows agencies to load pavement and ROW imagery for a specific location within the agency and sequentially travel down the roadway. If needed within the video logger, agencies can load

high-resolution images to provide more detailed site investigation while displaying PCI, IRI, and Rut index data for the selected section. In addition, the Video Logger **houses the Ladybug Panoramic ROW imagery, LCMS downward pavement imagery**, PCI scores, and right of way inventories.
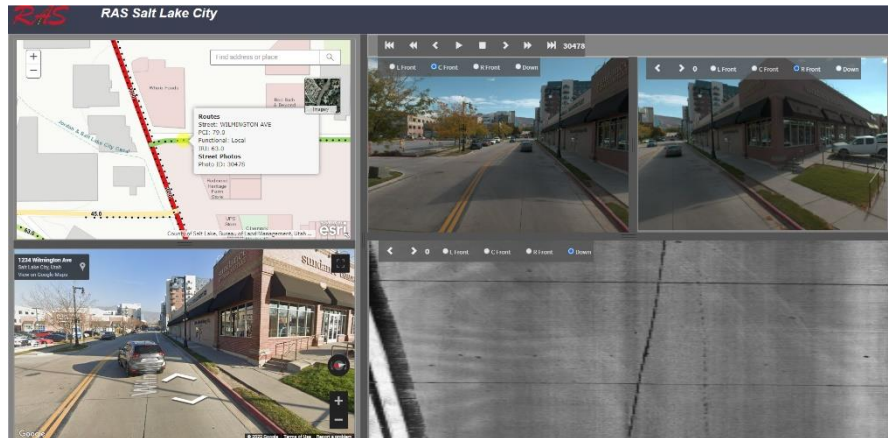
Following the Pavement Condition Assessment, all **LCMS-2 camera imagery** will be loaded to the Video Logger with each image resulting in **1 mm-pixel resolution and horizontal resolution of 4,000 pixels**. The benefit of having the LCMS imagery on the same platform as the Ladybug imagery is the ability to use the forward-facing camera to see what a typical driver would see from a windshield while comparing it against the downward LCMS laser array that focuses only on the pavement surface itself.

Service Category 5: Pavement Structural Analysis Equipment

RAS subconsultant and local engineering firm, HVJ associates, will assist in conducting subgrade analysis work for the evaluation of the structural capacity of pavement layers. HVJ utilizes a **Falling Weight Deflectometer (FWD)** to determine the stiffness related parameters of the pavement structure. Data delivery will be a database that includes the FWD deflection data points collected in the field as well as the Structural Strength Index (SSI) number tagged to the roadway segments. An SSI number will be calculated based on the FWD data using the method developed by TxDOT for use in the Pavement Management Information System (PMIS). This method incorporates deflection data, a traffic estimate, and annual rainfall estimates. The SSI is based on the relationship of the Surface Curvature Index (FWD deflection measured at the load – FWD deflection at the second sensor) and the deflections measured by the FWD sensor furthest from the loaded point. This method was developed for flexible pavements, but the concept can be extended to include rigid pavements.

HVJ Associates, Inc. (HVJ) owns and operates FWD equipment with adjustable sensors that can apply dynamic loads to the pavement from 4,000 to 50,000 pounds on a 12-inch diameter plate. Included in the HVJ equipment is a Dynatest Heavy Falling Weight Deflectometer (HWD). The HWD, more than any

other deflection device in use today, has had extensive theoretical and empirical testing to confirm the accuracy of the equipment and software used to interpret test results. The HWD uses a variable load applied by a small plate to the pavement. A weight is raised to a known height to simulate a wheel loading and is dropped onto the ram tube attached to the load application plate. Small deflections (a few mils – thousandths of an inch), can be measured by up to seven (7) sensors spaced at increasing distances from the maximum load.

The FWD tests will be conducted in accordance with ASTM D4694 "Standard Test Method for Deflection with Falling-Weight-Type Impulse Load Device" and ASTM D4695 "Standard Guide for General Pavement Deflection Measurements". These tests are performed at selected locations. Typical tests target a 9000 lb load with two drops recorded at each point. Deflection readings are recorded at 0", 12", 18", 24", 36", 48", and 60" from the center of the load plate.

The deflection data obtained are analyzed in several ways. First, measurements are grouped according to the existing pavement cross-section and then statistically analyzed to determine mean, standard deviation, and coefficient of variation. These values provide information for the evaluation of pavement sections relative to each other. Plots of deflection measurements versus station number (i.e. location) are used to identify weak pavement areas. Analyses are usually accomplished with the MODULUS computer programs developed by TxDOT for this purpose. The HWD is capable of applying loads from 9,000 up to 54,000 lbs. It is the most widely used unit in the world today.

Ground Penetrating Radar

HVJ can also mobilize a Ground Penetrating Radar (GPR) to provide thickness measurements of the different pavement layers at FWD test locations. This thickness data is used in the back-calculation of the pavement and subgrade layer moduli. GPR is a nondestructive testing tool that uses radio waves to acquire subsurface information. The GPR system can be run at the same time as FWD data is collected, allowing for simultaneous testing and adding no time to FWD data collection. All data is collected and processed in accordance with the ASTM D4748 "10 Standard Test Method for Determining the Thickness of Bound Pavement Layers Using Short-Pulse Radar."

Service Category 6: GIS Related Services

All data collected by RAS in the field is eventually linked to a spatial environment for post-processing and agency integration purposes.

RAS provides GIS Related Services through the development of a GIS file for data collection routing, centerline re-segmentation options, polygon layer development, supersegment layer development, unique identifier assignment, GIS synchronization with a pavement management system, and training on how to get the most out of the RAS GIS deliverable. In addition, RAS' large
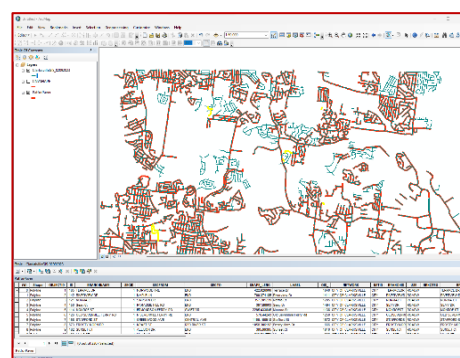
GIS team can serve as an extension of the agency's current GIS department if desired. RAS proposed QA/QC Manager, Mark Kramer, is well versed in GIS training as he previously served as a Director of IT for the Town of Gilbert for over 12 years and the Chief Technological Officer for Maricopa County Assessor's Office.

Service Category 7: Value-Added Services

Full Written Final Report

RAS can provide each agency with a final report/executive summary including study objectives, methodology utilized, project summary, dates of collection, analysis of current pavement management practices, rehabilitation plans, and multi-year budget scenarios. In addition, the agency will receive statistical charts, graphs, and area maps illustrating all PCI results, street segment lengths, widths, pavement type, the overall road quality, and findings from the pavement evaluation.
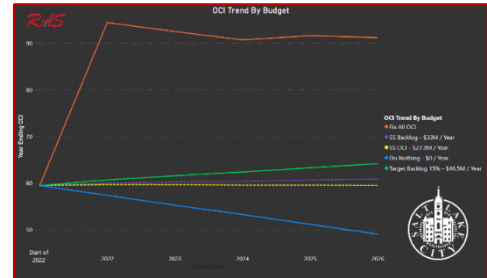
The report will be provided for review by agency staff and will be modified based on comments to produce a final report which will be delivered as a bound report in Microsoft Word (.doc and .docx) and Adobe (.pdf) format. All collected pavement data will be in a format for use with Esri ArcInfo GIS software.

Project Presentations

The RAS team can provide a public presentation to the City Council or Board of County Commissioners, including data, charts, and all final summary report data to showcase the results of the pavement condition survey. Scot and Zac have extensive experience preparing and presenting results of pavement and asset conditions assessments, as well as pavement budget scenarios and maintenance plans as final reports. This is a standard scope that we provide to all our asset management clients. Scot has worked with County Commissions or City Councils with several agencies including Hutto, TX; Rowlett, TX; Corpus Christi, TX; San Antonio, TX; Brownsville, TX; Durham, NC; Pitkin County, CO; Indianapolis, IN; and Laredo, TX to name a few.

Curb Ramp and ADA/Barrier-Free Ramp Compliance

An essential element of mobility and transportation is accessibility for all. As instructed in Title II of the Americans with Disabilities Act (ADA), State and Local entities are to remove barriers that impede access for individuals with physical, cognitive, developmental, and acquired disabilities. In addition to the pedestrian curb ramp inventory development described earlier in this proposal, RAS can also inventory any obstructions of curbs, note if a truncated dome is present (which alerts individuals with visual impairments of a street crossing), and provide measurements to determine if the ramp meets the 4-foot regulatory standards. Information collected by RAS can be utilized to guide facility maintenance and capital improvement programs to remediate the identified barriers and ensure ADA requirements are met.

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To accommodate this scope item, RAS would utilize the curb ramp inventory extracted in service category #2 to develop a comprehensive report that details the condition distribution of ramps, percentage of poor ramps, percentage of ramps missing truncated domes, number of obstructions, number of missing ramps, and many other areas of statistical importance when assessing overall compliance.

Stand Alone Field Operation for Collection of Asset Inventory

Right of Way asset inventory development can be completed with several different methodologies such as feet on ground surveys, photogrammetry, and detailed Lidar surveys. With the availability of mobile technology, feet on ground surveys are typically only needed when something is being inventoried outside of the road right of way. As further discussed in Service Category #2, RAS conducts photogrammetry asset extraction activities utilizing a Ladybug 360-degree camera to evaluate and inventory any asset seen within the ROW including above-ground point assets, above-ground linear assets, at-grade point assets, and at-grade linear assets.

If further accuracy is desired, the RAS Team can also utilize a mobile Lidar unit, as recently completed for the City of Austin's Traffic Sign Inventory Assessment. The RAS team would use one of the five mobile mapping systems available including a Reigl VMX-1HA, Two Trimble MX8s, a Trimble MX9, and a Leica Pegasus Two Ultimate. The mobile lidar the RAS team uses combines premium laser scanning, positioning, and imagery technologies to collect georeferenced point clouds and high-resolution imagery. Rigidly mounted and fully calibrated, the mobile lidar can collect over one million points per second, allowing high fidelity as-built asset and infrastructure modelling.

This mobile mapping system is comprised of survey-grade, dual-head laser scanners, GPS, Applanix IMU, a distance measurement unit (DMI), several on-board cameras (5-megapixel resolution), and a 360-degree spherical camera (total resolution of 30 megapixels). The system delivers 5 to 10 cm absolute positional accuracy and 5 mm of relative precision on hard surfaces with a range of 120m. Positional verification will be accomplished with post collection field survey of photo identifiable points, if necessary. The inherent accuracy, precision, coverage and range of our mobile mapping systems enables extraction of sidewalks and ramps at intersections but also full roadway section, guardrails, signs, digital terrain models, bridge clearances, and any other road furniture in the right of way.

Missing Sidewalks

During RAS sidewalk condition and sidewalk obstruction assessment, RAS can also note gaps in the sidewalk network by adding linework to an existing GIS file or creating a new GIS layer. The goal of this study is to provide safe walking spaces and provide a data-driven snapshot of where new sidewalks will deliver benefits in safety and mobility. A sidewalk gap analysis assists in strategically planning for new sidewalks where they will serve the greatest needs in the community. RAS has conducted a sidewalk gap analysis for the City of Hutto, TX to increase ADA accessibility.

Project Manager's Experience with Similar Projects

G. SCOT GORDON, PE, IAM
PROJECT MANAGER/SENIOR PAVEMENT ENGINEER

Mr. Gordon serves as President and Lead Pavement Engineer at Roadway Asset Services. Mr. Gordon has 30 years of experience in transportation engineering, geotechnical engineering, and construction materials testing including pavement design and optimization for transportation networks. As a professional engineer, he has managed numerous projects such as design/build highway projects, airfield pavement, and other government projects. He is an expert in the design, evaluation, monitoring, and research of pavement, pavement rehabilitation, and soil stabilization. Scot has completed numerous projects related to pavement management system implementation, pavement condition surveys, sign management surveys, sidewalk condition surveys, and road assessments utilizing LiDAR. He is responsible for conducting the RAS field pilot, reviewing pavement distresses identified by AI processing routines, and establishing channels of communication between the RAS team and agency staff.

KEY PROJECTS
City of Fort Worth, Texas – Pavement and ROW Data Collection
Mr. Gordon served as the Project Manager/Pavement Engineer for this project which included software implementation, network database development, automated field surveys, budget analysis, and maintenance optimization for the City's 6,600 lane mile pavement network. This project also included training of the City's engineering and field staff, the development of repair and rehabilitation scenarios, and the creation of budgeting decision trees to assist in optimization. Mr. Gordon provided field QA/QC of pavement, sidewalk, and ramp data to confirm the validity of the mobile data collection.

City of Burleson, Texas- Pavement Condition Survey
Mr. Gordon served as the Project Manager for the City's mobile image data collection project on 310 test miles of paved streets and 426 miles of sidewalks. Imagery and pavement distress information was collected utilizing RAC vehicles, in accordance with the ASTM D6433 methodology. Following data analysis, the RAS team confirmed that the data schema matched the City's Cartegraph database. Mr. Gordon was responsible for developing a pavement report with 1 round of multi-year Budget scenarios. Mr. Gordon was responsible for coordinating project needs, conducting a field validation study of 10 miles, and establishing channels of communication between City Staff and the RAS team.

City of Plano, Texas-Pavement Data Collection and Traffic Signs
Mr. Gordon served as the Project Manager/Pavement Engineer for the City's pavement condition data of 2,200 test miles of roadways. Mr. Gordon was responsible for assuring the quality of the pavement evaluation data. FAdditionally, the City conducted an inventory of its traffic signs located along the City's roadway network to begin its traffic sign management plan.

FIRM
Roadway Asset Services

EXPERIENCE
30 years

LOCATION
Highland Village, Texas

EDUCATION
M.E., Civil Engineering, Texas A&M University, 1990
B.S., Civil Engineering, Texas A&M University, 1989

REGISTRATIONS
-TX Professional Engineer, Certificate Number:88099
-CO Professional Engineer, Certificate Number:30239
-MD Professional Engineer, Certificate Number:33493
-FL Professional Engineer, Certificate Number:83979
-NC Professional Engineer, Certificate Number:46459
-NM Professional Engineer, Certificate Number:26330
-GA Professional Engineer, Certificate Number:45916
-Institute of Asset Management Certified

Professional Affiliations
-American Council of Engineering Companies
-Tarrant County Board of Directors, 2015-present
-American Society of Highway Engineers, DFW Section Treasurer, 2015-2017
-American Council of Engineering Companies, Colorado
Board of Directors, 2000-2001
-Charles County Chamber of Commerce, Board of Directors, 2009-2010

City of Denton, Texas- Parking Lot Condition Survey
Mr. Gordon is serving as the Project Manager for the City's PCI based survey on 117 acres of parking lots. RAC vehicles are utilized to provide imagery and pavement distress information in accordance with the ASTM D6433. Project phases include conducting the condition survey, delivering the condition results in a geodatabase format, and loading the inspection data into Cartegraph OMS database. Mr. Gordon is responsible for conducting a field pilot study for the reviewal of distress interpretations with City Staff.

City of Arlington, Texas-Pavement Data Collection and Integration
Mr. Gordon served as the Project Manager/Pavement Engineer for the City's pavement condition survey of 3,000 lane miles of roadways. Mr. Gordon was responsible for assuring the quality of the pavement evaluation data. Following collection, automated pavement distress extraction occurred with verification/modification by trained pavement extractors. Pavement distress types were based on the ASTM D6433 standard. He also managed the collection of rut and roughness data. The pavement information was integrated into the City's Cartegraph pavement management system. Mr. Gordon analyzed the existing degradation curves and calculated revised curves to reflect the actual measured performance.

City of Corpus Christi, Texas - Pavement Data Collection
Mr. Gordon served as the Project Manager for the City's pavement condition data and ROW inventory for 2,448 miles of roadways. The collection was fulfilled through the utilization of RAC vehicles. Areas assessed include pavement condition, curb and gutter, pavement markings and striping, traffic signs, sidewalks, and ADA ramps. Following collection, pavement information was integrated into Cartegraph. Mr. Gordon was responsible for maintaining communication with City Staff by hosting monthly meetings to review preliminary survey results and project status.

City of Rowlett, Texas - Pavement Condition Assessment and ROW Asset Inventory
Mr. Gordon served as the Project Manager for the City's street network collection of 327 test miles of roadways and 107 miles of alleys. RAS is completing the City's pavement condition assessment with RAC vehicles to collect pavement data, in accordance with the ASTM D6433. Additionally, RAS is completing an extensive ROW asset inventory for the following assets: traffic signs, pavement markings, pavement striping, sidewalks, and ADA ramps. The pavement data was imported into PAVER and VUEWorks.

City of Rockwall, Texas- Pavement Condition Survey
Mr. Gordon serves as the Project Manager for the City's 242 centerline mile network of paved streets and 64 test miles of alley segments. RAC vehicles were utilized to provide roadway imagery and pavement distress in accordance with the ASTM D6433. Mr. Gordon conducted a 10 mile field validation study with City Staff to review processing routines before conducting the full survey. Mr. Gordon was responsible for delivering weekly progress reports and schedule updates to City Staff.

City of Mesquite, Texas – Pavement Analysis Services
Mr. Gordon served as the Project Manager/Pavement Engineer for the City of Mesquite's pavement assessment on 1,251 lane miles of roadway. The project consisted of pavement data collection, condition rating, and sidewalk data collection. As the Project Manager, Mr. Gordon oversaw the development of five-year and ten-year pavement rehabilitation plans for the City.

BART WILLIAMSON, FCLS
PROJECT PRINCIPAL

Mr. Williamson brings over 30 years of management experience in a wide variety of projects and programs that include public works, insurance, and transportation on a national level. He has developed an in-depth understanding of business processes and politics that are germane to governments. Mr. Williamson has assisted with asset management needs assessments, pavement condition surveys, ROW collection projects, and client deliverables. Mr. Williamson is responsible for assigning the necessary equipment and staff to projects. In addition, he confirms agencies receive high-quality deliverables on time and within budget.

FIRM
Roadway Asset Services

EXPERIENCE
30 years

EDUCATION
B.S., Business Marketing Honors and Distinction Indiana University, 1989

KEY PROJECTS

Harris County, Texas- Pavement Condition Survey and ROW Asset Inventory
Mr. Williamson was the Client Services Manager for Harris County's automated data collection project. The network was collected utilizing a fleet of automated data collection vehicles to capture street level images for use in pavement and asset extraction. The study evaluated roadway imagery, pavement distress, pavement condition, sidewalks, and curb ramps for over 12,000 test miles in all 4 political districts.

City of San Antonio, Texas – Pavement Condition Index Modeling Update
Mr. Williamson served as the Project Principal for the City's analysis on PCI rate deterioration between pavement evaluation results inputted into Cartegraph in 2019 and 2022. The project consisted of the RAS team updating deterioration models, recommending improvements for overall maintenance, and providing an average PCI per year per District. RAS developed a multitude of budget scenarios within Cartegraph based on the approved deterioration models.

City of Denton, Texas- Parking Lot Condition Survey
Mr. Williamson is serving as the Project Principal for the City's PCI based survey on 117 acres of parking lots. RAC vehicles are utilized to provide imagery and pavement distress information in accordance with the ASTM D6433. Project phases include conducting the condition survey, delivering the condition results in a geodatabase format, and loading the inspection data into Cartegraph OMS database. Mr. Williamson is responsible for coordinating project needs and maintaining the timeline for deliverables.

City of Corpus Christi, Texas - Pavement Data Collection and Integration
Mr. Williamson served as the Project Principal for the City's pavement condition data and ROW inventory of 2,448 miles of roadways. The collection was fulfilled through the utilization of RAC vehicles. Areas assessed include pavement condition, curb and gutter, pavement markings and striping, traffic signs, sidewalks, and ADA ramps. Following collection, pavement information was integrated into Cartegraph. Mr. Williamson was responsible for hosting virtual meetings with City staff to discuss preliminary findings and project status.

City of New Braunfels, Texas – Pavement Data Collection and ROW Inventory
Mr. Williamson served as the Project Principal for the City's pavement data collection of its more than 469 test miles of roadways. Pavement data was collected utilizing a RAC vehicle that captures images for all pavement and ROW assets. Pavement imagery and data were integrated into Cartegraph.

City of Austin, Texas– Pavement Data Collection (2022) and Traffic Sign Data Collection (2021)

Mr. Williamson served as the Project Principal for the City of Austin's 2021 Traffic Sign Data Collection. The network was collected utilizing mobile LiDAR to provide the City with data and imagery on sign faces, sign structures, sign location, and sign assets. Mr. Williamson is currently serving as the Project Principal for the City's 2022 Pavement Data Collection. This project consists of providing distress data for the City's 3,750 test mile road network. Following collection, RAS will provide the City with a Video Logger for staff to visually display the inventory elements and results of the survey.

Bexar County, Texas – Pavement and ROW Asset Management

Mr. Williamson was the Project Manager of four automated data collection projects for Bexar County. The projects consisted of collecting roadway asset data related to the County's pavement network and traffic infrastructure including 30,837 traffic signs, sidewalks, pavement markings, and guardrails. The network was collected utilizing an automated data collection vehicle to capture street level images for use in pavement and asset extraction. The image database was comprised of industry standard JPEGs, with geo-referenced information being delivered via an Esri geodatabase and linked to Cartegraph.

City of Houston, Texas- Pavement Condition Assessment

Mr. Williamson served as the Assistant Project Manager for the Pavement Condition Survey and ROW asset inventory of 1,231 centerline miles of major streets and 4,918 centerline miles of local streets for two collection cycles. The project consisted of providing the City PCI and IRI data that were rated in accordance with the ASTM D6433 methodology. In addition, street assets including curb and gutter, sidewalks, sidewalk ramps, and sidewalk obstructions were inventoried and assessed. Data was imported into StreetSaver Plus for the City's management of various assets. Mr. Williamson worked alongside City staff to ensure all requirements of the project were met and deliverables were provided in a timely and proper manner.

City of Rowlett, Texas - Pavement Condition Assessment and ROW Asset Inventory

Mr. Williamson served as the Project Principal for the City's street network collection of 327 test miles of pavement condition survey and 107 miles of alley inventory. RAS completed the City's pavement condition assessment utilizing its fleet of RAC vehicles, in accordance with the ASTM D6433. Additionally, RAS completed an extensive ROW asset inventory for the following assets: traffic signs, pavement markings, pavement striping, sidewalks, and ADA ramps. The pavement data was imported into the City's PAVER database and VUEWorks®.

City of Lewisville, Texas – Pavement Analysis Services for Streets and Alleys

Mr. Williamson served as the Client Services Manager on a contract with the City of Lewisville to perform a variety of pavement-related services. The team used an automated data collection vehicle to collect pavement information including distresses, severity, and extent; pavement width; ramps and sidewalks. A Pavement Condition Index (PCI) was also determined for each road segment in accordance with ASTM D6433. A pavement final report was completed and the data was formatted for import into PAVER.

City of Amarillo, Texas- Street and Alley Pavement Assessment

Mr. Williamson is serving as the Project Principal for the City's automated data collection on 2,195 lane miles of paved streets and 511 miles of alleys. RAC vehicles will be utilized to provide pavement imagery and ROW asset imagery for pedestrian curb ramps and curb and gutter. Following data collection, pavement imagery will be imported into Road TRIP for the analysis of automated cracks and calculation of PCI values, in accordance with the ASTM D6433 definitions. Mr. Williamson is responsible for maintaining communication with City Staff by setting up virtual meetings.

Zac Thomason, MBA
ASSISTANT PROJECT MANAGER, SENIOR VICE PRESIDENT

Mr. Thomason brings over 17 years of dedicated pavement and asset management experience where his focus has been on the use of semi-automated and automated technologies for pavement distress surveys, enterprise software implementation, pavement preservation, budget modeling & forecasting, and multi-year rehabilitation plan development. In addition to pavements, Mr. Thomason has vast experience with Right of Way asset inventory development that ranges from roadside features such as signs & supports, sidewalks, pedestrian curb ramps, striping & markings, curb & gutter, guardrail, bike racks, and nearly any asset that can be seen in the right of way. He has also managed complex sidewalk and pedestrian curb ramp inventory assignments that have included off road vehicle data collection, advanced LiDAR surveys to acquire geometric measurements (ramp, landing, & flare), long-range project prioritization sequencing, and project planning. Mr. Thomason will be responsible for pavement maintenance optimization and overall project coordination.

FIRM
Roadway Asset Services

PAVEMENT MANAGEMENT EXPERIENCE
17 years

EDUCATION
M.B.A., Business Administration, University of Phoenix, 2007
B.S., Global Business, Arizona State University, 2005

Municipal Leadership Experience in Texas: Denton, Denton County, Richardson, Cleburne, Flower Mound, Carrollton, Grapevine, Rockwall, Rowlett, The Colony, Hurst, Pearland, Friendswood, Huntsville, Beaumont, Cleburne, Grand Prairie, Keller, and many others.

PROJECT LEADERSHIP ROLES
City of Denton, Texas- Parking Lot Condition Survey
Mr. Thomason is serving as the Assistant Project Manager for the City's PCI based survey on 117 acres of parking lots. RAC vehicles are utilized to provide imagery and pavement distress information in accordance with the ASTM D6433. Project phases include conducting the condition survey, delivering the condition results in a geodatabase format, and loading the inspection data into Cartegraph OMS database. Mr. Thomason is responsible for delivering the data in a format compatible with the City's existing Cartegraph database.

City of Richardson, Texas – Pavement Condition Assessment ROW Asset Inventory
Mr. Thomason served as the Assistant Project Manager for the collection of pavement distress data on 470 centerline miles of roadways and 210 centerline miles of alleys. The data was collected using semi-automated technology, processed at the segment level, and aggregated to a PCI following the ASTM D6433 standards. The condition results were eventually loaded into the Cartegraph Navigator software for pavement analysis and reporting purposes. In addition to the pavement condition data, imagery collected during the survey was utilized to develop an inventory of roadside features such as sidewalks, screening walls, and bridge rails.

City of Flower Mound, Texas– Pavement Condition Survey & Lucity Load
Mr. Thomason served as the Assistant Project Manager for the initial inventory development and collection of pavement distress data that adhered to the ASTM D6433 standard. Data collection was conducted using advanced laser-based technology on over 400 survey miles of roadway. The data was processed at the segment level and aggregated to a Pavement Condition Index (PCI) for reporting purposes. Supersegments (projects) were developed and loaded into the Lucity (CentralSquare) software for the development of budgetary modeling and a multi-year maintenance and rehabilitation plan. Mr. Thomason presented the results of the survey to the Technical Advisory Committee and the City Council.

City of Carrollton, Texas – Pavement Condition Survey & Sidewalk Assessment

Mr. Thomason served as the Assistant Project Manager for the semi-automated data collection of 721 survey miles of arterial, collector, residential, and alley roads. The condition data was collected following the ASTM D6433 protocols and processed into a segment level Pavement Condition Index (PCI). The pavement condition data was then loaded into a custom spreadsheet for the purposes of conducting a detailed analysis, budgetary modeling, deterioration forecasting, and prioritization of the 5-year rehabilitation plan. The results of the survey were documented in a final report and delivered to City staff for input. In addition to the pavement condition survey, a sidewalk assessment was conducted in the City whereby an inventory was developed from the pavement equipment imagery and a modified gas-powered golf cart was mobilized to drive the sidewalks and perform a detailed sidewalk assessment that captured vertical displacements, shattered slabs, sag/tilt/heave, and cracking data to be used in the development of a Citywide sidewalk prioritization plan.

City of Hurst, Texas – Pavement Condition Survey & Pavement Analysis

Mr. Thomason served as the Project Manager for the initial inventory development and collection of pavement distress data that adhered to the ASTM D6433 standard. Data collection was conducted using advanced laser-based technology on over 170 survey miles of roadways. The data was processed at the segment level and aggregated to a PCI for reporting purposes. Projects were developed and loaded into a custom spreadsheet that was utilized to run budgetary modeling and develop a prioritized multi-year rehabilitation plan. Mr. Thomason reported the results of the survey to the City Council at their annual budget retreat.

City of Grand Prairie, Texas – Pavement Condition Survey & Pavement Analysis

Mr. Thomason served as the Assistant Project Manager for the initial inventory development and collection of pavement distress data on 430 survey miles of roadways. The data was processed at the segment level and aggregated to a Pavement Condition Index (PCI) for reporting purposes. Pavement preservation activities were programmed into the City's pavement analysis and loaded into a custom spreadsheet that was synchronized with the City's GIS via a python coded script. This synchronization allowed for the import of pavement condition information from the spreadsheet into Cityworks CMMS software.

City of The Colony, Texas – Pavement Condition Survey & Pavement Analysis

Mr. Thomason served as the Project Manager for the semi-automated data collection of 250 survey miles of arterial, collector, and residential roads. The condition data was processed into a modified ASTM D6433 PCI score and loaded into a custom spreadsheet for budgetary modeling and prioritization of the 5-year rehabilitation plan. The results of the survey were documented in a final report and presented to City Council at a regular public meeting.

City of Rowlett, Texas - Pavement Condition Assessment and ROW Asset Inventory

Mr. Thomason served as the Assistant Project Manager for the City's street network collection of 327 test miles of pavement condition survey and 107 miles of alley inventory. RAS completed the City's pavement condition assessment utilizing its fleet of RAC vehicles, in accordance with the ASTM D6433. Additionally, RAS completed an extensive ROW asset inventory for the following assets: traffic signs, pavement markings, pavement striping, sidewalks, and ADA ramps. Data was being imported into PAVER and VUEWorks®.

City of Rockwall, Texas- Pavement Condition Survey

Mr. Thomason served as the Assistant Project Manager for the City's 242 centerline mile network of paved streets and 64 test miles of alley segments. RAC vehicles were utilized to provide roadway imagery and pavement distress in accordance with the ASTM D6433. Mr. Thomason assisted with the import of data into the City's PAVER database.

Mark Kramer, PE, MBA
QUALITY CONTROL/QUALITY ASSURANCE MANAGER

Mr. Kramer serves as the Chief Data Officer at Roadway Asset Services. Mr. Kramer has 24 years of experience in engineering and information technology projects including pavement condition, sign inventory, and sidewalk condition surveys. He is an expert in commercial off-the-shelf software, data management, data analysis, and delivery of technology projects. Mr. Kramer will review data and coordinate with the pavement evaluation team to ensure data is representative of the agency's street network. The following is a brief list of projects he has managed.

KEY PROJECTS

City of Rowlett, Texas - Pavement Condition Assessment
Mr. Kramer served as the Quality Assurance Manager for the City's street network collection of 327 test miles of pavement condition survey and 107 miles of alley inventory. RAS completed the City's pavement condition assessment with RAC vans to collect pavement data, in accordance with the ASTM D6433. Additionally, RAS is completing an extensive ROW asset inventory for the following assets: traffic signs, pavement markings, pavement striping, sidewalks, and ADA ramps. The pavement data is being imported into PAVER database as well as VUEWorks®. Mr. Kramer led the engineering team's review of automated cracks identified/analyzed through the Road TRIP (Technical Rating Intelligence Program) software.

City of Corpus Christi, Texas - Pavement Data Collection and ROW Asset Inventory
Mr. Kramer served as the Quality Assurance Manager for the City's pavement condition data and ROW inventory for the 2,448 miles of roadways. Using RAC vehicles, data was collected on pavement condition, curb and gutter, pavement markings and striping, traffic signs, sidewalks, and ADA ramps. Following collection, pavement information was imported into Cartegraph.

City of New Braunfels, Texas – Pavement Data Collection
Mr. Kramer served as the Quality Assurance Manager for the City's pavement condition survey of its more than 469 test miles of roadways. Pavement data was collected utilizing an RAC vehicle that captures images for all pavement and ROW assets. Following collection, PCI survey results were analyzed utilizing RAS' Road TRIP software to identify distresses. Pavement imagery and data was integrated into Cartegraph. Mr. Kramer provided pavement condition data review and data checks to ensure the City obtained an accurate scoring of their network.

City of Seguin, TX – Pavement Condition Survey and ROW Asset Inventory
Mr. Kramer was the Quality Assurance Manager for the City of Seguin's pavement condition survey of 200 centerline miles of roadway. The project used a RAC vehicle to collect the City's pavement data and ROW imagery for an inventory of curb ramps and curb and gutter. The project included data collection, five-year analysis and recommendations, and implementation into Streetlogix pavement management software. Mr. Kramer performed data checks to ensure 100% of the network was being analyzed and the imagery collected provided a clear and accurate representation of roadway conditions.

FIRM
Roadway Asset Services

EXPERIENCE
24 years

LOCATION
Phoenix, Arizona

EDUCATION
MBA-IT Western International,2003
B.S., Civil Engineering, Arizona State University, 1998

REGISTRATIONS
-AZ Professional Engineer, Certificate Number: 40225

Professional Certifications
Microsoft SQL Server
Microsoft Power BI

RAFAEL RIVERA
DATA COLLECTION MANAGER

Mr. Rivera has over 12 years of experience in automated data collection of pavement and ROW asset inventories. Mr. Rivera has been involved with the collection and management of over 100,000 miles of roadways. Mr. Rivera's positions have included automated data collection vehicle operator, pavement analyst, LiDAR analyst, and GIS analyst. Mr. Rivera is responsible for the operation of automated equipment and providing route tracking to field operation crews.

KEY PROJECTS

City of Denton, Texas- Parking Lot Condition Survey

Mr. Rivera is serving as the Data Collection Manager for the City's PCI based survey on 117 acres of parking lots. RAC vehicles are utilized to provide imagery and pavement distress information in accordance with the ASTM D6433. Project phases include conducting the condition survey, delivering the condition results in a geodatabase format, and loading the inspection data into Cartegraph OMS database. Mr. Rivera is responsible for the operation of automated data collection vehicles.

Harris County, Texas- Pavement Condition Survey and ROW Asset Inventory

Mr. Rivera was the Data Collection Manager for Harris County's automated data collection project. The network was collected utilizing a fleet of automated data collection vehicles to capture street level images for use in pavement and asset extraction. The study evaluated roadway imagery, pavement distress, pavement condition, sidewalks, and curb ramps for over 12,000 test miles in all 4 political districts.

City of Corpus Christi, Texas - Pavement Data Collection and Integration

Mr. Rivera served as the Data Collection Manager for the City's pavement condition survey and ROW inventory for 2,448 miles of roadways. The collection was fulfilled through the utilization of RAC automated pavement collection vehicles. Areas assessed include pavement condition, curb and gutter, pavement markings and striping, traffic signs, sidewalks and ADA ramps. Following collection, pavement information was integrated into Cartegraph. Mr. Rivera performed data checks to ensure that segments that exhibited low image quality were recollected to provide a full picture of City maintained roads.

City of Amarillo, Texas- Street and Alley Pavement Assessment

Mr. Rivera is serving as the Data Collection Manager for the City's pavement condition assessment on 2,195 lane miles of paved streets and 511 miles of alleys. RAC vehicles are used to collect imagery for the pavement condition assessment and ROW asset inventory of pedestrian curb ramps and curb and gutter. Following collection, data will be imported into Road TRIP (for automated crack analysis and PCI rating based on the ASTM D6433 standards. Mr. Rivera is responsible for route tracking and managing the operation of vehicle systems.

City of Colleyville, Texas-Pavement Condition Assessment

Mr. Rivera was the Data Collection Manager for the City's 334 lane miles of City maintained roads. A pavement condition survey was completed per the ASTM D6433 and the results were imported into StreetSaver and VUEWorks.

FIRM
Roadway Asset Services

EXPERIENCE
12 years

EDUCATION
B.S., Mechanical Engineering, University of Central Florida, 2011
B.S., Aerospace Engineering, University of Central Florida, 2016

R. F. (FRANK) CARMICHAEL, III, PE
SENIOR PROJECT MANAGER

EDUCATION	MS, Civil Engineering, University of Texas at Austin, 1974
	BS, Civil Engineering, University of Texas at Austin, 1973
LICENSE	Professional (Civil) Engineer, Texas – No. 43815 and
	National Council of Engineering Examiners

EXPERIENCE SUMMARY

Mr. R. F. (Frank) Carmichael III is a Civil Engineer with more than 40 years of highway, traffic, transportation, bridge, airport, construction materials, and pavement engineering experience related to civil engineering infrastructure projects. Mr. Carmichael has research and development experience, practical design, and engineering to include plans, specifications and estimates, and construction inspection and management experience. He has been the lead pavement engineer for the evaluation of all the streets maintained by the following Texas cities Houston, San Antonio, New Braunfels, Brownsville, Beaumont, Brownwood, Lancaster, Lubbock, Brady, Nacogdoches, and Laredo and large urban counties including Travis and Fort Bend. Mr. Carmichael served as Sr. Project Manager on the following relevant projects:

RELEVANT EXPERIENCE

City of Grapevine Pavement Condition Survey Training, TX. Developed of pavement condition survey training to assist the City of Grapevine in implementation of the Cartegraph pavement management software. A paper data form which can be scanned or entered into the Cartegraph software is being developed.

President George Bush Turnpike, Dallas County. Completed pavement design calculations for both main lanes and the frontage road of the Turnpike Eastern Extension – Section 31.

City of Cedar Hill Evaluation of City Maintained Pavements. Established pavement visual condition survey procedures and developed a database and computer program to plan maintenance and rehabilitation of City maintained streets based on budget scenarios.

City of Lancaster Infrastructure Maintenance Management Program (IMMP), TX. Developed a complete pavement maintenance management program for the City. The Infrastructure Maintenance Management Program (IMMP) analyzes pavement conditions and prioritizes the selection of street sections (blocks) for rehabilitation and maintenance based on City budgets.

City of Grand Prairie Reconstruction Design of Mayfield Road, TX. Designed a new Portland cement concrete (PCC) pavement for KSA Engineers, Inc for Mayfield Road between the Northbound Frontage Road of SH 360 to Great Southwest Parkway. Determined pavement subgrade requirements based on the geotechnical soil investigations and laboratory testing results.

City of Mesquite Forney Road, TX. Designed reinforced concrete pavement within a highly industrial area. The project is approximately 2800 linear feet with limits from Town East Boulevard to the Union Pacific Railroad Intermodal Facility.

REUBEN C. JAMES, PE
STRUCTURAL TESTING COORDINATOR

EDUCATION   BS, Civil Engineering, Texas A&M University, 2004

LICENSE   Licensed Professional Engineer, Texas (107426)

Location   Austin, TX

EXPERIENCE SUMMARY

Mr. James has more than 18 years of civil engineering experience including 10 years of experience performing and leading Asset Management operations extensively throughout the state of Texas. In addition to his Asset Management expertise, Mr. James has significant experience developing traffic control plans, street reconstruction projects, non-destructive testing operations, and is proficient in CAD, GIS, and a variety of database systems.

RELEVANT PROJECT EXPERIENCE

City of San Antonio, Texas- International Airport Pavement Evaluations: As Project Manager, Mr. James led NDT evaluations utilizing a Heavy Weight Falling Deflectometer of airside pavement including runways and taxiways. Deliverables included NDT measurements for inclusion in the airport's pavement management systems.

City of Austin, Texas- SH 130 Construction Phase Verification: As Project Manager, Mr. James managed NDT evaluations of the SH 130 Toll Road Segments 5 and 6 during construction. FWD measurements were taken on prepared subgrade, base, and final finish layers of the pavement for verification purposes.

City of Fair Oaks Ranch, Texas- Pavement Evaluation: Mr. James served as a Project Manager for the City's Pavement Evaluation. He was responsible for the collection of NDT measurements throughout the entire City of Fair Oaks Ranch. NDT measurements were used for a city-wide pavement evaluation program.

City of San Antonio, Texas- Pavement Management Project: HVJ integrated data collected from the pavement condition survey into the City's pavement management database. Condition data included: rutting, alligator cracking, transverse cracking, longitudinal or edge cracking, patching, raveling, flushing, crack sealant condition for asphalt surfaces; slab cracks, faulting, spalling, scaling, pop-outs, and joint sealant condition for concrete surfaces; sidewalks, shoulders, curb and gutter, bridge rideability, railroad rideability, pavement marking, street signs, and ramps. As Project Manager, Mr. James was responsible for managing the data collection software.

City of Houston, Texas- Data Collection Services: HVJ provided QC services to review the asset data captured throughout the City of Houston. Mr. James was responsible for managing the team of GIS technicians charged with reviewing the data. He provided work flows and specialized data viewing tools that allowed the team to efficiently review large volumes of data. The following asset types were reviewed over the course of this project: Curb & Gutter, Sidewalks, Pedestrian Ramps, and various Right of Way obstructions. All assets were reviewed for accuracy and any discrepancies were noted and reported back

BRADLEY ADAMS, PE

Pavement Program Manager

A. Licensure/Certification
Professional Engineer, Texas No. 79259 (Licensed 28 years)

B. Years with ESP
2

C. Years Experience in Proposed Role
34

D. City of Office Residence
Dallas, TX

Education
BS, Civil Engineering, University of Texas - Arlington

300 Mile Asset inventory, Huntington, West Virginia

Town of Indian Trail, NC Pavement & Asset Inventory and PCI

Mr. Adams has been the lead for large geospatial, pavement, and engineering projects since 2001. He has worked closely with state and municipal agencies since 1990, providing engineering, asset inventory, surveying, aerial mapping, aerial lidar, static lidar, mobile mapping, software development, and technology implementation services.

Key Project Experience

- **Town of Indian Trail, NC Pavement & Asset Inventory, Indian Trail, NC.** Program manager for 77 miles of pavement condition analysis and asset inventory, including a full PCI report for the pavement conditions, plus an inventory of all the signs, sidewalks and curb and gutter in the town.

- **City of Columbia Pavement & Asset Inventory, Columbia, SC.** Project manager for 200+ miles of pavement condition surveys and full asset inventory of sidewalks, handicap ramps, and striping and pavement markings. ESP has deployed their Multi- Sensor Pavement and Asset inventory van with a Digital Laser Profiler, 3D Laser Crack Measurement System, and a Trimble MX 9 mobile mapping unit to collect all the pavement information as well as capturing all the city assets in the road right of way.

- **Pavement Inventory and PCI, Ontario Canada.** Program manager for 3,200 miles of pavement condition analysis for the cities of Ottawa, Kingston, and Peterborough, as a sub consultant to another firm.

- **Bay City Pavement Inventory, Bay City, TX.** Project manager for 106 miles of Bay City, Texas owned and maintained street network. ESP deployed our multi-sensor ICC Iris ProPAVE pavement collection van and to maximize the investment in collection, integrated our Leica Pegasus: Two Ultimate mobile mapping system to collect survey grade lidar and associated imagery. The entire project was collected in less than a week, updating the PCI scores for the roadways.

- **300 Mile Asset Inventory with Mobile Lidar*, Huntington, West Virginia.*** Principal-in-charge for the comprehensive Asset Inventory of the entire city using mobile lidar. Collection was completed in five days and features extracted in two months. Project delivered over 10,000 signs, 1,000 signals, 3,300 storm inlets, 250 tree planters and almost 1,000,000 feet of sidewalks.

* Project performed prior to joining ESP
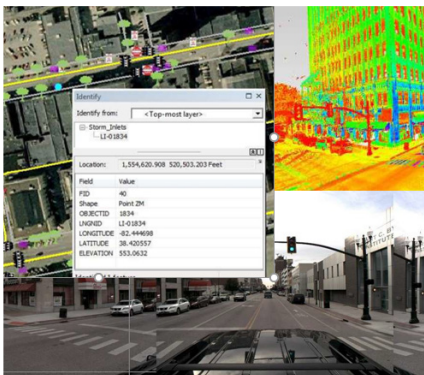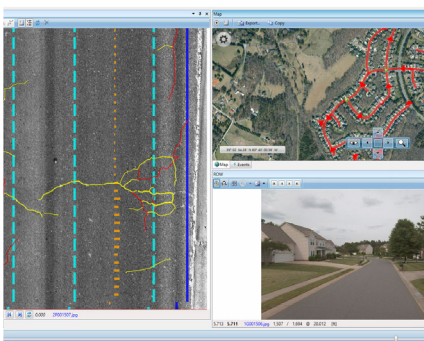
Sandra Marrero, E.I.
PROJECT ENGINEER

Ms. Marrero is a Project Engineer for Roadway Asset Services, where she focuses on pavement analysis for roadway asset collection projects. Sandra has over eight years of experience evaluating pavement conditions, processing pavement ratings, preparing reports, performing maintenance budget scenarios, and reporting the results of project findings in meetings with the Client. Her software experience includes Cartegraph, Streetlogix, PAVER, VUEWorks, ArcGIS, AutoCAD, and Civil 3D. Ms. Marrero will assist in developing a final pavement report.

KEY PROJECTS

City of Burleson, Texas - Pavement Condition Survey
Ms. Marrero served as a Project Engineer for the City's pavement condition survey of 310 test miles and 426 miles of sidewalks. RAS completed the City's pavement condition assessment utilizing its fleet of RAC vehicles to collect pavement data in accordance with ASTM D6433. Additionally, RAS completed a ROW asset inventory for sidewalks and ADA ramps. Following data analysis, the RAS team confirmed that the data schema matched the City's Cartegraph database. Ms. Marrero was responsible for developing the final pavement report.

City of Lewisville, Texas – Pavement Analysis Services for Streets and Alleys
Ms. Marrero served as a Project Engineer for the City of Lewisville's pavement-related services on city streets. Automated data collection vehicles were utilized to collect pavement information including distresses, severity, and extent; pavement width; ramps and sidewalks. A Pavement Condition Index (PCI) was also determined for each road segment in accordance with ASTM D6433. Ms. Marrero provided pavement analysis services on the project including preparing the final report and presenting results.

Town of Little Elm, Texas – Pavement and Asset Data Collection Services
Ms. Marrero served as a Project Engineer for the City's pavement condition assessment on 131 centerline miles. A ROW asset inventory on traffic signs was also conducted to collect the following attributes: location, sign type (MUTCD), sign text, physical condition, and support structure. Ms. Marrero performed quality assurance checks of the pavement data and prepared the final report.

City of Denton, Texas- Roadway and Parking Lot Condition Survey
Ms. Marrero is serving as the Project Engineer for the City's PCI based survey on 117 acres of parking lots. RAC vehicles are utilized to provide imagery and pavement distress information in accordance with the ASTM D6433. Project phases include conducting the condition survey, delivering the condition results in a geodatabase format, and loading the inspection data into Cartegraph OMS database.

City of Rowlett, Texas - Pavement Condition Assessment and ROW Asset Inventory
Ms. Marrero served as the Project Engineer for the City's street network collection of 327 test miles of pavement condition survey and 107 miles of alley inventory. RAS completed the City's pavement condition assessment utilizing its fleet of RAC vehicles, in accordance with the ASTM D6433. Additionally, RAS completed an extensive ROW asset inventory for the following assets: traffic signs, pavement markings, pavement striping, sidewalks, and ADA ramps. The pavement data was imported into the City's PAVER database and VUEWorks®.

FIRM
Roadway Asset Services

EXPERIENCE
8 years

EDUCATION
B.S., Civil Engineering, University of Puerto Rico, 2013

REGISTRATIONS
-FL Engineer Intern, Certificate Number:1100023293

5. Quality Assurance/Quality Control Procedures

Detailed Quality Management Plan

RAS has a detailed **Data Quality Management Plan (DQMP)** to provide our clients with a systemized method for assuring data is representative of the conditions present. Included in the DQMP is a description of condition survey procedures, data collection equipment, system calibration/verification, standards used for processing and collection (ASTM, AASHTO), data checks, roadway segment review, data conversions, and reporting. The breadth of the RAS quality assurance plan enables immediate implementation with data collection projects.

An essential element to RAS QA/QC protocols is the inclusion of a field/pilot study that allows the collection, processing, and review of condition data to ensure that data is representative of the expectations and needs of agency staff. Following this step, corrections to processing routines are made based on standard construction practices/soil conditions.

RAS also has internal processes to take into consideration scoring irregularities before they occur. For instance, steep hills can cause irregularities in the IRI data because if the van rolls back on a hill, the IRI data will contain inconsistencies. To best prevent these issues, RAS recommends collecting roads with steep hills during off peak times so collection can occur in one pass at a constant speed. The less frequently the collection vehicle stops, the lower our probability is for the van to roll back. RAS constantly monitors these types of situations and has determined the best IRI data is collected when you are traveling at a constant speed with little lane departure, no sudden braking, and no rollback. After an internal QC of the data, RAS determines if any inconsistencies are observed and recollects those sections at night to avoid any of the above factors that can affect the profile data. If desired by an agency, RAS can supply the participant with our published DQMP. The document's length and technical nature didn't make it suitable for inclusion in this proposal submission.

Quality Assurance Step #1 – Network Database Review (Completeness / Gap Analysis)

While a simple routine in every project, the cornerstone to project initiation is conducting a complete diagnostic of the roadway network, including a full and thorough assessment of the agency's GIS centerline and PMS inventory database. This will include a review of the agency's data requirements (i.e., what information is needed/desired) and subsequent data gap analysis (what is missing).
RAS will include the following in this initial review:
  a. Base inventory information, (i.e., Functional Class, lengths, areas, surface type, etc.)
  b. Historical condition information
  c. Status of survey history
  d. Construction and maintenance history
  e. Review of activity treatments and unit costs
  f. Review of existing pavement deterioration curves

Quality Assurance Step #2- Field Pilot Validation

The field pilot allows RAS to collect, process, and review condition data with an agency's staff members to ensure accuracy with the data collection and interpretation protocols. The review of the RAS condition data will be hosted by Project Manager, Scot Gordon, in the field, where they will review site conditions with an agency's staff members. Scot uses a field tablet that contains the segment PCI score along with the deduct points assigned to each distress such that everyone understands the PCI impacts of distresses that are present. If issues are confirmed in the field, then corrective action to the initial field pilot will be processed for the agency's review prior to commencing the full network data processing activities. The field pilot allows the RAS team to accommodate local roadway design, soil conditions, modify the distress processing software, and proceed forward with network-level data processing. The results of this comparison will be discussed with an agency's staff members and resolutions to differences between the inspection approach will be developed and resolved.

As a cornerstone to the development of quality data deliverables, Scot Gordon, PE has performed a field pilot data validation study with agency staff on hundreds of pavement condition surveys. Throughout his career, Scot has worked with various agencies on the field pilot data validation including but not limited to:

- Chicago MAP, IL
- Durham, NC
- Houston, TX
- Fort Worth, TX
- San Antonio, TX

- Indianapolis, IN
- Virginia Beach, VA
- Salt Lake City, UT
- Corpus Christi, TX
- Denver, CO

Quality Assurance Step #3 – Subsystem Monitoring In The Field

During the survey, the collection software monitors the GPS subsystems and alerts the operator if the GPS feed drops out or if GPS quality is compromised. The IMU will provide acceleration-based corrections during this time to ensure that GPS accuracy is maintained as much as possible.

The RAS team will also review a randomized sample of images to ensure that it complies with the requirements of the specifications throughout the course of the network matching and event QC. Upon completion of the network matching, an image report shall be generated with the total image count compared with that expected for each road.

Daily progress reports are produced by uploading sensor, GPS, and event data and matching against the road network definition. Progress reports include the following, road sections collected, length discrepancies, and remaining sections to be completed.

Quality Assurance Step #4 – Automated Crack Analysis & Engineer Review

The automated crack analysis in **RoadTRIP™** detects cracks that are overlaid on the pavement images and offset to assist with the verification of the detected cracks. During reporting, the distress cracks are defined by road zone and accumulated according to the units defined in the client specification. The RAS data reduction routine is built into the **RoadTRIP™** software as the application was built to consume the detailed LCMS files and reduce them into individual distress extent and severity scores, based on the defined limits (ASTM D6433). The software takes this an additional step by reducing the detailed distress data into a calculated Pavement Condition Index (PCI) for each segment of roadway maintained by the agency. The severity levels are verified for resolution through visual quality control checks of image files.

Senior Pavement Engineers and Principals of RAS, Mark Kramer, PE and Scot Gordon, PE, will lead a team of experienced pavement inspectors to perform QC to confirm the distresses and severity of the pavement condition data collected by the automated technology. This manual quality review is performed, in accordance with the principles of the ASTM D6433 standard, using the LCMS pavement images gathered during collection with the distresses superimposed and color coded, such as what can be seen in the corresponding image.
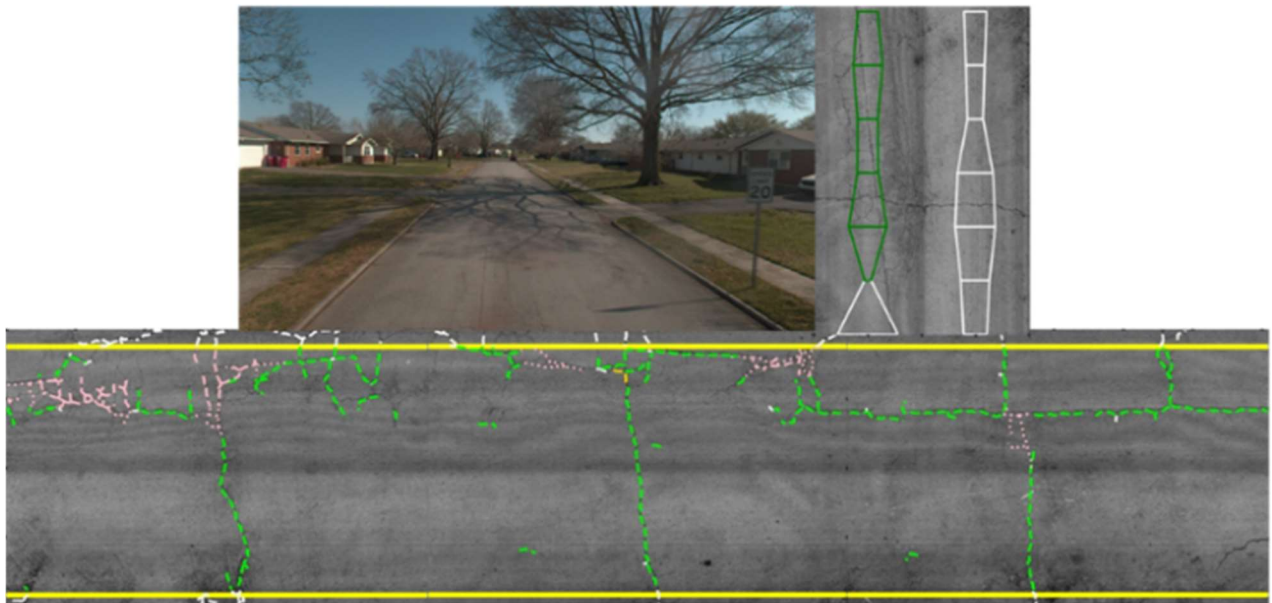
6. Assumptions Made in Responding to the Requirements

RAS has not made any assumptions outside of the scope of services listed by NCTCOG for Pavement Analysis and Related Services.

7. Exceptions to the Requirements

RAS has no exceptions to the presented scope of work.

Tab E: References

Tab E: References

Contact

Troy Farrow
Engineering Technician

City of New Braunfels

550 Landa Street
New Braunfels, TX 78130

(830)221-4018

TFarrow@nbtexas.org

Scope

Time Period: 2022

Project Budget: $168,490

Responsibilities:
- Pavement Evaluation
- PCI Calculation
- IRI Measurement
- GIS Segmentation
- Review Soil Conditions
- Deterioration Curves
- ROW Assets
- Cartegraph Import

RAS Role: RAS served as the Prime Consultant

New Braunfels, TX- Pavement Condition Survey

RAS conducted a pavement condition survey in compliance with the ASTM D6433 pavement rating and assessment for 469 test miles. An RAC vehicle was utilized to perform a two pass collection on arterial, collector, and striped local roads while a one pass collection was performed for residential local roadways. In addition to the pavement condition survey, RAS conducted a ROW asset inventory utilizing the RAC vehicles Ladybug 360 degree camera. Assets inventoried include curb and gutter, traffic sign inventory, pavement striping, and pavement marking.

RAS identified the following attributes for curb and gutter: AssetID, location, photo image link, travel direction, side of road, physical condition rating (good, fair, poor), painted color (none, yellow, red, green, blue, others), and material type.

RAS also identified the following attributes for pavement striping: AssetID, X, Y location, location (street name), type (continuous left, double, hash, etc.), striping color, physical condition rating (good, fair, poor), and length.

Following collection and analysis, RAS delivered a final report consisting of an executive summary, project methodology, street segment PCI, and exhibits displaying PCI, street segment length, lanes, and pavement type. RAS composed a final GIS file geodatabase containing pavement data and PCI values for each segment in a format compatible with Cartegraph OMS software.

As Project Manager, Scot Gordon provided consulting on pavement rehabilitation and maintenance options regarding the street's level of service and anticipated improvements to PCI values.

Contact

Mike Lasby
Asset Manager

City of Rowlett

4310 Industrial St.
Rowlett, TX 75088

O: (972)412-6263
M: (214)885-3001

mlasby@rowlett.com

Scope

Time Period: 2022

Project Budget: $128,998

Responsibilities:

- Pavement Evaluation
- PCI Calculation
- IRI Measurement
- GIS Segmentation
- ROW Assets
- Review Soils Conditions
- Deterioration Curves

RAS Role: RAS served as the Prime Consultant

City of Rowlett, TX- 2022 Pavement Condition Survey

RAS conducted the City of Rowlett's pavement condition survey on 327 test miles of roadways and 107 test miles of alleys. Roadway Asset Collection (RAC) vehicles were utilized to collect pavement distress and ROW asset imagery for an inventory and condition assessment. Imagery for the ROW asset inventory was captured with the Ladybug 360 degree camera on the following assets: alleys, sidewalks, and traffic signs. Following collection, data was imported into RAS' pavement analysis tool Road TRIP for automated crack analysis and calculation of Pavement Condition Index (PCI) based on the ASTM D6433 extent/severity definitions.

RAS identified the following attributes for the City's 8,432 traffic signs: AssetID, X,Y, location, MUTCD code, sign text, photo image link, physical condition rating (good, fair, poor), location (street name assets located on), sign face direction, legend color, back color, and support structure type.

RAS also surveyed the City's 344.59 miles of sidewalks for the following attributes: AssetID, street name, photo image, physical condition rating (good, fair, poor), width, length, and existent (Yes/No).

RAS formatted the data for import into PAVER and ran analysis scenarios for the City's development of maintenance and rehabilitation plans. RAS also provided the City a pavement final report with statistical charts, graphs, and area maps illustrating all PCI results and findings from the pavement evaluation. A draft of the summary report was provided to City staff and modified based on comments to produce a final report delivered in Microsoft word (.doc and .docx) and Adobe format (.pdf).

Contact

John Donnelly
Director of Public Works

City of Seguin

205 N River Street
Seguin, TX 78155

(210)508-4888

jdonnelly@
seguintexas.gov

Scope

Time Period: 2021-2022

Project Budget: $84,800

Responsibilities:
- Pavement Evaluation
- PCI Calculation
- IRI Measurement
- GIS Segmentation
- Review Soil Conditions
- Deterioration Curves
- ROW Assets
- System Training

RAS Role: RAS served as the Prime Consultant

Seguin, TX- Asset Management for Pavement Maintenance

RAS performed the 2021 pavement condition survey for the City of Seguin's 200 centerline mile network. RAS completed the survey using RAC vehicles to provide imagery on pavement conditions. A PCI score was calculated in accordance with the ASTM D6433 standards. RAS provided GIS based deliverables and formatted the data for an import into StreetLogix. In addition, RAS performed a pilot study, provided a final report, and assisted the City in a Council presentation regarding various funding amounts and strategies to improve the City's PCI. RAS also completed an inventory of 76 miles of sidewalks, 1755 ADA ramps, and 181 miles of curb and gutter.

As part of the ADA ramp asset inventory, the following attributes were captured: ramp identification, ramp photograph, GPS location, street name, physical condition rating (good, fair, poor), detectable warning (yes/no), and street segment identification. For curb and gutter, RAS collected the following attributes: asset identification, asset image, curb and gutter type, color, and physical condition rating.

Project Manager, Mr. Gordon, met with City staff to refine the budget requirements and develop a 10-year maintenance plan to improve the efficiency of treatments. Mr. Gordon ran the pavement scenarios and budget requirements within the City's pavement management software, StreetLogix.

Additionally, RAS assisted with the implementation of the selected asset management software, StreetLogix. RAS matched the data schema for the pavement and assets to be successfully imported and managed within StreetLogix providing the City the tools to update changing asset conditions.

City of Salt Lake City, UT-Pavement Condition Survey

RAS performed the 2021 pavement condition survey for Salt Lake City's 730 test mile network. RAS completed the ASTM D6433 based survey using its fleet of RAC vehicles. RAS provided GIS based deliverables and formatted the data for import into Cartegraph. RAS performed a pilot study, provided a final report, and assisted City staff in presenting data to City Council regarding various funding amounts and strategies for improving the City's PCI and its level of service.

RAS produced a Video Logger for the City to take a virtual drive down a roadway for a snapshot of pavement and ROW conditions. The Video Logger provides the client with access to ROW and pavement imagery in an organized manner to quickly make informed decisions on conditions within various areas of the City's network without having to leave the office.

The evaluation project also included a technical report presenting the predominate distresses and statistical analysis of the condition results and repair recommendations. The report provided results based upon surface type and division of functional classification for all roadways.

RAS performed five-year pavement maintenance and preservation program scenarios for the City's consideration using BOSS software. The analysis ran 10 profile models for increasing budgets to define how the City's budget will impact network OCI and network backlog. The scenarios included very small budgets, well below current funding and very large scenarios, well above current funding levels. The results from all scenarios were used to establish a funding level trend.

Contact

David Jones,
Program Manager

City of Salt Lake City

2001 S State St N3-600
Salt Lake City, UT 84190

(801)535-6425

David.jones@slcgov.com

Scope

Time Period: 2021-2022

Project Budget: $202,975

Responsibilities:
- Pavement Evaluation
- IRI Measurement
- Deterioration Curves
- PCI Calculation
- GIS Segmentation
- Cartegraph Import
- RAS Video Logger

RAS Role: RAS served as the Prime Consultant

Contact

Clint Blackburn
Project Manager

City of Durham

101 City Hall Plaza
Durham, NC 27701

(704)301-7193

clint.blackburn@
durhamnc.gov

Scope

Time Period: 2021-2022

Project Budget: $374,712

Responsibilities:
- Pavement Evaluation
- IRI Measurement
- Review Soil Conditions
- Deterioration Curves
- PCI Calculation
- GIS Segmentation
- ROW Assets
- System Training

RAS Role: RAS served as the Prime Consultant

City of Durham, NC- Pavement Condition Survey

RAS performed the 2021 pavement condition survey for the City of Durham's 1,540 lane mile network. The project consisted of a Pavement Condition Index (PCI) Survey and ROW asset inventory covering traffic signs, curb and gutter, and crosswalk slopes. Data collection for the pavement condition survey was completed with Roadway Asset Collection (RAC) vehicles, in accordance with the ASTM D6433. The RAC vehicle is equipped with an inertial profiler for Roughness and Ride measurements, a Second-Generation Pavemetrics Laser Crack Measurement System for pavement imagery, and a Point Gray Ladybug 5+ 30 MP 360 camera for asset capture.

36,416 traffic signs were inventoried and assessed with the following attributes for each sign: X,Y location, street name, Asset ID, Facility ID, photo image link, MUTCD code, physical condition rating, and support type. RAS also assessed curb and gutters for 1,075 lane miles and provided the following attributes: Asset ID, Facility ID, photo image link, physical condition rating, painted color, and material type. The RAS GIS technicians inventoried 1,229 crosswalks.

RAS provided GIS based deliverables and formatted the data for an import into PAVER. The database provided the City with vital information including street name, segment length, surface type, roadway classification, age of the surface, date of observation, PCI score, cracking/distress description, and pavement width.

As the Project Manager, Mr. Gordon met with City Staff to refine budget requirements and develop a 10-year maintenance plan. After presenting results to the engineering staff, Mr. Gordon met with City Council during budget planning meetings to present the findings and the recommended maintenance plan.

Tab F: Pricing Proposal

Attachment A (per Exhibit D) - Pricing Proposal Form

Proposed prices shall include all field inspectors, vehicles, tools, equipment, traffic control, contractor maintenance, and customer service support necessary to provide the desired services.　　　Respondents must not include mobilization fees in their pricing and may not include them in any contract(s) that result from this RFP.

If a respondent elects to submit a percentage discount off their catalog pricing for any or all of their services, the corresponding price for each numbered activity listed in Attachment A must account for the proposed discount listed in Exhibit C.　　　If you are not proposing a percentage-discount, please use your established list price for each for each numbered pavement analysis and related services activity.

[Example: If your catalog price is $100 per unit, and you indicate a 5% discount from catalog pricing in Exhibit C, your pricing form in Attachment A should reflect a unit price of $95.

Conversely, if your catalog price is $100 per unit, and you indicate a 0% discount or N/A in Exhibit C, your pricing form in Attachment A should reflect a unit price of $100.]

Service Category #1: Pavement Data Collection

Activity #	Activity Description	Unit	Unit Base Cost ($)	Unit Cost ($) 0-200 Lane Miles	Unit Cost ($) 201-700 Lane Miles	Unit Cost ($) 700+ Lane Miles	A Total Units	B Agreed Upon Cost ($)/Unit	C=AxB Total Agreed Upon Cost ($)
1	Automatically and continuously measure pavement cracking, texture, rutting and geometrics. Equipment used for rut measurement shall be capable of measuring both wheel track ruts simultaneously.	Lane Mile [1]		$147	$121	$97			0
2	Collect pavement surface distress and structural condition information through automated means for all Participant-owned roadways.	Lane Mile [1]		$1	$1	$1			0
3	Provide a customized digital condition rating system to collect user defined severity/extent based pavement distresses and pertinent roadway attributes to accommodate a standardized approach to collecting data	Lump Sum	$2,500						0
4	Collect dual-wheel path roughness data to International Roughness Index standards.	Lane Mile [1]		$1	$1	$1			0
5	Collect pavement performance information that includes rutting using a minimum of seven (7) sensors (include pricing for nine (9) sensors as well), fatigue cracking, transverse cracking using a minimum of four (4) sensors, and longitudinal cracking	Lane Mile [1]		$1	$1	$1			0
6	Perform friction testing	Lane Mile [1]		$200	$200	$200			0
7	Measure lane striping reflectivity quality	Lane Mile [1]		$70	$65	$60			0

Service Category #2: Assest Inventory

Activity #	Activity Description	Unit	Unit Base Cost ($)	Unit Cost ($) 0-200 Lane Miles	Unit Cost ($) 201-700 Lane Miles	Unit Cost ($) 700+ Lane Miles	A Total Units	B Agreed Upon Cost ($)/Unit	C=AxB Total Agreed Upon Cost ($)
8	Collect sidewalk data to include location, length, width, location in relation to curb and if greenspaces exist between curb and sidewalk, and sidewalk condition to create shape (.shp) files for incorporation into the Participant's GIS system, if applicable	Lane Mile [1]		$50	$45	$40			0
9	Collect sidewalk Barrier Free Ramp data to include location, configuration, presence of truncated domes or other detectable warning feature, and condition and create shape (.shp) files for incorporation into the Participant's GIS system, if applicable	Lane Mile 1	$50						0
10	Collect roadway sign data to include type and location and create shape (.shp) files for incorporation into the Participant's GIS system, if applicable.	Lane Mile 1	$75						0
11	Collect photos of Barrier Free Ramps, sidewalks, curb condition, drive approach, and/or roadway signs inventoried under items 8, 9, and 10 above.	Lane Mile 1	$1						0
12	Collect location of curb and gutter and create shape (.shp) files for incorporation into the Participant's GIS system, if applicable.	Linear Feet	$0.02						0
13	Collect location and type of visible in-pavement features such as valves, manhole covers, etc. and create shape (.shp) files for incorporation into the Participant's GIS system, if applicable.	Lane Mile 1	$40						0
14	Collect locations of trees, including height and spread	Lane Mile 1	$85						0
15	Collect bike lane locations, including width, length, and associated signage and striping.	Linear Feet	$0.02						0
16	Utilize Ground Penetrating Radar for relocating utilities (for maintenance plans).	Linear Feet	$2.35						0
17	Collect data on location and surface condition of bridge approaches	Each	$10.00						0
18	Collect information on bridge deck condition	Each	$5.00						0
19	Perform Parking Lot Pavement Condition Assessment (Thru-Travel Lanes) w/ Inventory, Attribute, & Geodatabase Development	Square Yard	$0.15						0
20 (a-v) below:	Right of Way Assets Database Development (GPS & Camera Configuration):								
20a	Sign & Support Database Development	Each	$3.00						0
20b	Markings & Striping Database Development	Each	$4.00						0
20c	Traffic Signals/ Flashers and Controllers Database Development	Each	$2.50						0
20d	Street Lights Database Development	Each	$2.25						0
20e	Drop Inlets Database Development	Each	$2.25						0
20f	Drivepads Database Development	Each	$2.25						0
20g	Bridges Database Development	Each	$4.00						0
20h	Speed Humps Database Development	Each	$2.50						0
20i	Street Furniture Database Development	Each	$2.75						0
20j	Cattle Guards Database Development	Each	$2.50						0
20k	Guardrails & Roadside Pedestrian Fence Database Development	Each	$4.00						0
20l	Culverts and Ditches Database Development	Each	$2.75						0
20m	Cabinets Database Development	Each	$4.00						0
20n	Utility Poles Database Development	Each	$2.25						0
20o	Fire Hydrant Database Development	Each	$2.25						0
20p	Medians Database Development	Each	$4.00						0
20q	Valves Database Development	Each	$2.25						0

Activity #	Activity Description	Unit	Unit Base Cost ($)	Unit Cost ($) 0-200 Lane Miles	Unit Cost ($) 201-700 Lane Miles	Unit Cost ($) 700+ Lane Miles	Total Units	Agreed Upon Cost ($)/Unit	Total Agreed Upon Cost ($)
20r	Manhole Covers Database Development	Each	$2.25						0
20s	Trees Database Development	Each	$3.50						0
20t	Catch Basins/ Drainage Inlets from Master Drainage Plan Database Development	Each	$2.50						0
20u	Sidewalk Database Development	Each	$3.00						0
20v	Curb & Gutter Database Development	Each	$3.00						0

Service Category #3: Pavement Management Analysis

				Provide Price Per Tiered Group			A	B	C=AxB
Activity #	Activity Description	Unit	Unit Base Cost ($)	Unit Cost ($) 0-200 Lane Miles	Unit Cost ($) 201-700 Lane Miles	Unit Cost ($) 700+ Lane Miles	Total Units	Agreed Upon Cost ($)/Unit	Total Agreed Upon Cost ($)
21	Calculate the International Roughness Index (IRI) for each road segment in accordance with ASTM E1926. Provide results compatible with the Participant's GIS database, if applicable.	Lane Mile [1]		$1	$1	$1			0
22	Calculate a Pavement Condition Index (PCI) score for each road segment using an approved pavement management system and in accordance with ASTM D6433 or ASTM E3303. Provide results compatible with the Participant's GIS database, if applicable.	Lane Mile [1]		$29	$29	$29			0
23	With input from Participant's staff, devise a weighing system taking into account PCI, IRI, average daily traffic for thoroughfares (traffic count raw data provided by Participant), public safety emergency routes, and apply this 0-100 numeric index to the roadway information collected for the entire jurisdiction. Provide results compatible with the Participant's GIS database, if applicable. **Cost includes base cost plus lane mile unit cost.**	Lane Mile [1]	$7,500	$0	$1	$2			0
24	Estimate the annual budget required to meet the long-term goals regarding desired pavement condition levels. **Cost includes base cost plus lane mile unit cost.**	Each Participant	$5,000	$0	$1	$2			0
25	Create a five year and ten year pavement rehabilitation plan with input from Participant's staff. **Cost includes base cost plus lane mile unit cost.**	Each Participant	$2,500	$0	$1	$2			0
26	Recommend the computer hardware and software needed for successful implementation, potentially including recommendations for licenses of pavement management system software and other geodatabase software as needed.	Each Participant	$1,500						0
27	Train Participant staff and provide assistance to the Public Works and IT Department as needed for the use of data collected through the fully automated system. **(20 person maximum per class)**	Day	$3,000						0

Service Category #4: Electronic Products

				Provide Price Per Tiered Group			A	B	C=AxB
Activity #	Activity Description	Unit	Unit Base Cost ($)	Unit Cost ($) 0-200 Lane Miles	Unit Cost ($) 201-700 Lane Miles	Unit Cost ($) 700+ Lane Miles	Total Units	Agreed Upon Cost ($)/Unit	Total Agreed Upon Cost ($)
28	Roadway information that shall be collected and provided to the Participant at a minimum includes items a. through i. in Exhibit B	Lane Mile [1]		$12	$10	$8			0
29	Collect digital images at 25-foot intervals of the road surface condition and link to a geodatabase (minimum forward facing imagery).	Lane Mile [1]		$13	$10	$8			0
30	Load assessment data for all Participant-maintained pavements into a pavement management system required by local government Participant(s), if applicable. (Example: MicroPaver). The assessment data shall include visual observations, photographs and measurements collected by instrumentation. **Cost includes base cost plus lane mile unit cost.**	Each Participant	$5,000	$1	$5	$7			0
31	Implement map module so that pavement condition and other data can be integrated, displayed, and accessed through the map interface in a format consistent with the Participant's horizontal and vertical control network system, if applicable. **Cost includes base cost plus lane mile unit cost.**	Each Participant	$7,000	$1	$5	$10			0
32	Provide to the Participant the pavement condition data in a pavement management system database approved by Participant. Coordinate with the Participant's IT department to provide pavement condition data in a format compatible with the Participant's Environmental Systems Research Institute (ESRI) GIS database, if applicable. **Cost includes base cost plus lane mile unit cost.**	Each Participant	$2,500	$5	$7	$7			0
33	Provide asset management tools or systems (not just collection) (i.e., 15-year plan about how to fix or repair assets). **Cost includes base cost plus lane mile unit cost.**	Each Participant	$7,500	$5	$10	$12			0

Service Category #5: Pavement Structural Analysis

				Provide Price Per Tiered Group			A	B	C=AxB
Activity #	Activity Description	Unit	Unit Base Cost ($)	Unit Cost ($) 0-200 Lane Miles	Unit Cost ($) 201-700 Lane Miles	Unit Cost ($) 700+ Lane Miles	Total Units	Agreed Upon Cost ($)/Unit	Total Agreed Upon Cost ($)
34	Collect and analyze pavement structural condition information through the use of a falling weight deflectometer in accordance with industry standards on designated participant-owned roadways.	**							0
35	Collect and analyze pavement structural condition information through the use of Ground Penetrating Radar (GPR) in accordance with industry standards on designated participant-owned roadways.	**							0
36	Collect and analyze pavement structural condition information through the use of pavement cores in accordance with industry standards on designated participant-owned roadways (traffic control included)[2]	**							0

Service Category #6: GIS Related Services

				Provide Price Per Tiered Group			A	B	C=AxB
Activity #	Activity Description	Unit	Unit Base Cost ($)	Unit Cost ($) 0-200 Lane Miles	Unit Cost ($) 201-700 Lane Miles	Unit Cost ($) 700+ Lane Miles	Total Units	Agreed Upon Cost ($)/Unit	Total Agreed Upon Cost ($)
37	GIS Clean-Up Services	Each Participant	$4,500						0
38	GIS Support Services	Each Participant	$4,500						0
39	GIS Remote Training Sessions from GIS Manager/ Expert (2-Hour Sessions)	Each Participant	$500						0

Service Category #7: Value Added Services

				Provide Price Per Tiered Group			A	B	C=AxB
Activity #	Activity Description	Unit	Unit Base Cost ($)	Unit Cost ($) 0-200 Lane Miles	Unit Cost ($) 201-700 Lane Miles	Unit Cost ($) 700+ Lane Miles	Total Units	Agreed Upon Cost ($)/Unit	Total Agreed Upon Cost ($)

| #	Description	Unit							
40	Full Written Final Report- Firm shall prepare and submit a written project report summarizing the work performed, dates of collection, methodology, and results.	Each Participant	$10,000						0
41	Project Presentation- Firm shall prepare and present a written project report summarizing the work performed, dates of collection, methodology, and results to the Participant's legislative body.	Each Participant	$3,000						0
42	Provide Curb Ramp and ADA/Barrier Free Ramp Compliance Survey	Each Participant	$5,000						0
43a	Stand-alone field operation for collection of asset inventory only, with different levels of position accuracy and abilities to use data for attribute registration and conditions. **Cost includes base cost plus lane mile unit cost.** a.Photogrammetry	Lane Mile [1]	$6,500.00	$123	$105	$95			0
43b	Stand-alone field operation for collection of asset inventory only, with different levels of position accuracy and abilities to use data for attribute registration and conditions. **Cost includes base cost plus lane mile unit cost.** b.Mobile Lidar	Lane Mile [1]	$4,000	$173	$160	$147			0
44	Generic asset types, allowing for any item within line of sight of the collection vehicle. Asset types include items a. through d. in Exhibit B. **Cost includes base cost plus lane mile unit cost.**	Lane Mile [1]	$4,500	$130	$115	$100			0
45	Provide consultancy services to develop linework in GIS for missing sidewalks in order to quantify and identify on a map	Hour	$150						0
							TOTAL		0

[1] Lane mile is to be defined as a mile traveled as

    1. A single pass on alleyways

    2. A centered single pass on residential streets

    3. Includes the outside lane in each direction for collectors and arterials (2 total).

[2]Spacing for pavement cores to be negotiated with each participant.

** The awarded Contractor(s) shall provide all necessary field inspectors, vehicles, tools, equipment, traffic control and other services required to perform this work. No engineering services are available under this contact. Any activities that Participant and/or Contractor deem to require the service(s) of an engineer must be procured separately and are the sole responsibility of that party."
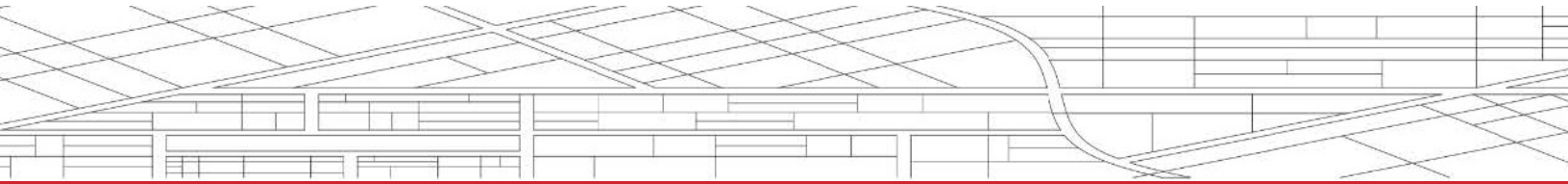
Tab G: Required Attachments

REQUIRED ATTACHMENT CHECKLIST

Please utilize this checklist to ensure that all required attachments are included with your proposal. IF AN ATTACHMENT DOES NOT APPLY, PLEASE MARK AS "**NOT APPLICABLE**" AND SUBMIT WITH THE PROPOSAL. FAILURE TO SUBMIT **ALL REQUIRED DOCUMENTS** MAY NEGATIVELY IMPACT YOUR EVALUATION SCORE.

- ☑ Page X - Cover Sheet

- ☑ Page XX - Attachment I: Instructions for Proposals Compliance and Submittal

- ☑ Page XX - Attachment II: Certification of Offeror

- ☑ Page XX - Attachment III: Certification Regarding Debarment

- ☑ Page XX - Attachment IV: Restrictions on Lobbying

- ☑ Page XX - Attachment V: Drug-Free Workplace Certification

- ☑ Page XX - Attachment VI: Certification Regarding Disclosure of Conflict of Interest

- ☑ Page XX - Attachment VII: Certification of Fair Business Practices

- ☑ Page XX - Attachment VIII: Certification of Good Standing Texas Corporate Franchise Tax Certification

- ☑ Page XX - Attachment IX: Historically Underutilized Businesses, Minority Or Women-Owned Or Disadvantaged Business Enterprises

- ☑ Page XX - Attachment X: Attestation of Contracts Nullifying Activity

- ☑ Page XX - Exhibit A: Service Area Designation Forms

- ☑ Page XX - Exhibit B: Description of Desired Services for Proposed Pricing

- ☑ Page XX - Exhibit C: Service Questionnaire

- ☑ Page XX - Exhibit D: TXShare Pricing Proposal Instructions

- ☑ Respondent recognizes that all proposals must be submitted electronically through Public Purchase by the RFP due date and time. All other forms of submissions will be deemed nonresponsive and will not be opened or considered.

ATTACHMENT I:
INSTRUCTIONS FOR PROPOSALS COMPLIANCE AND SUBMITTAL

Compliance with the Solicitation

Submissions must be in strict compliance with this solicitation. Failure to comply with all provisions of the solicitation may result in disqualification.

Acknowledgment of Insurance Requirements

By signing its submission, Offeror acknowledges that it has read and understands the insurance requirements for the submission. Offeror also understands that the evidence of required insurance may be requested to be submitted within ten (10) working days following notification of its offer being accepted; otherwise, NCTCOG may rescind its acceptance of the Offeror's proposals. The insurance requirements are outlined in Section 6.04.

Name of Organization/Contractor(s):

Roadway Asset Services, LLC

Signature of Authorized Representative:

Date: 2/17/2023

ATTACHMENT II:
CERTIFICATIONS OF OFFEROR

Name of Organization/Contractor(s):

Roadway Asset Services, LLC

Signature of Authorized Representative:

Date: 2/17/2023

ATTACHMENT III:
CERTIFICATION REGARDING DEBARMENT, SUSPENSION AND OTHER RESPONSIBILITY MATTERS

This certification is required by the Federal Regulations Implementing Executive Order 12549, Debarment and Suspension, 45 CFR Part 93, Government-wide Debarment and Suspension, for the Department of Agriculture (7 CFR Part 3017), Department of Labor (29 CFR Part 98), Department of Education (34 CFR Parts 85, 668, 682), Department of Health and Human Services (45 CFR Part 76).

The undersigned certifies, to the best of his or her knowledge and belief, that both it and its principals:

1. Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any federal department or agency;

2. Have not within a three-year period preceding this contract been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State, or Local) transaction or contract under a public transaction, violation of federal or State antitrust statues or commission of embezzlement, theft, forgery, bribery, falsification, or destruction of records, making false Proposals, or receiving stolen property;

3. Are not presently indicated for or otherwise criminally or civilly charged by a government entity with commission of any of the offense enumerated in Paragraph (2) of this certification; and,

4. Have not within a three-year period preceding this contract had one or more public transactions terminated for cause or default.

Where the prospective recipient of federal assistance funds is unable to certify to any of the qualifications in this certification, such prospective recipient shall attach an explanation to this certification form.

Name of Organization/Contractor(s):

Roadway Asset Services, LLC

Signature of Authorized Representative:

[signature]

Date: 2/17/2023

ATTACHMENT IV:
RESTRICTIONS ON LOBBYING

Section 319 of Public Law 101-121 prohibits recipients of federal contracts, grants, and loans exceeding $100,000 at any tier under a federal contract from using appropriated funds for lobbying the Executive or Legislative Branches of the federal government in connection with a specific contract, grant, or loan. Section 319 also requires each person who requests or receives a federal contract or grant in excess of $100,000 to disclose lobbying.

No appropriated funds may be expended by the recipient of a federal contract, loan, or cooperative agreement to pay any person for influencing or attempting to influence an officer or employee of any federal executive department or agency as well as any independent regulatory commission or government corporation, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with any of the following covered federal actions: the awarding of any federal contract, the making of any federal grant, the making of any federal loan the entering into of any cooperative agreement and the extension, continuation, renewal, amendment, or modification of any federal contract, grant, loan, or cooperative agreement.

As a recipient of a federal grant exceeding $100,000, NCTCOG requires its subcontractors of that grant to file a certification, set forth in Appendix B.1, that neither the agency nor its employees have made, or will make, any payment prohibited by the preceding paragraph.

Subcontractors are also required to file with NCTCOG a disclosure form, set forth in Appendix B.2, if the subcontractor or its employees have made or have agreed to make any payment using nonappropriated funds (to include profits from any federal action), which would be prohibited if paid for with appropriated funds.

LOBBYING CERTIFICATION
FOR CONTRACTS, GRANTS, LOANS, AND COOPERATIVE AGREEMENTS

The undersigned certifies, to the best of his or her knowledge or belief, that:

1. No federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an officer or employee of a Member of Congress in connection with the awarding of any federal contract, the making of any federal loan, the entering into of any cooperative Contract, and the extension, continuation, renewal, amendment, or modification or any federal contract, grant, loan, or cooperative contract; and

2. If any funds other than federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this federal contract, grant, loan, and or cooperative contract, the undersigned shall complete and submit Standard Form – LLL, "Disclosure Form to Report Lobbying", in accordance with the instructions.

3. The undersigned shall require that the language of this certification be included in the award documents for all sub-awards at all tiers and that all sub-recipients shall certify accordingly.

Name of Organization/Contractor(s):

Roadway Asset Services, LLC

Signature of Authorized Representative:

Date: 2/17/2023

ATTACHMENT V:
DRUG-FREE WORKPLACE CERTIFICATION

The __Roadway Asset Services, LLC__ (company name) will provide a Drug Free Work Place in compliance with the Drug Free Work Place Act of 1988. The unlawful manufacture, distribution, dispensing, possession or use of a controlled substance is prohibited on the premises of the __Roadway Asset Services, LLC__ (company name) or any of its facilities. Any employee who violates this prohibition will be subject to disciplinary action up to and including termination. All employees, as a condition of employment, will comply with this policy.

CERTIFICATION REGARDING DRUG-FREE WORKPLACE

This certification is required by the Federal Regulations Implementing Sections 5151-5160 of the Drug-Free Workplace Act, 41 U.S.C. 701, for the Department of Agriculture (7 CFR Part 3017), Department of Labor (29 CFR Part 98), Department of Education (34 CFR Parts 85, 668 and 682), Department of Health and Human Services (45 CFR Part 76).

The undersigned subcontractor certifies it will provide a drug-free workplace by:

Publishing a policy Proposal notifying employees that the unlawful manufacture, distribution, dispensing, possession or use of a controlled substance is prohibited in the workplace and specifying the consequences of any such action by an employee;

Establishing an ongoing drug-free awareness program to inform employees of the dangers of drug abuse in the workplace, the subcontractor's policy of maintaining a drug-free workplace, the availability of counseling, rehabilitation and employee assistance programs, and the penalties that may be imposed on employees for drug violations in the workplace;

Providing each employee with a copy of the subcontractor's policy Proposal;

Notifying the employees in the subcontractor's policy Proposal that as a condition of employment under this subcontract, employees shall abide by the terms of the policy Proposal and notifying the subcontractor in writing within five days after any conviction for a violation by the employee of a criminal drug abuse statue in the workplace;

Notifying the Board within ten (10) days of the subcontractor's receipt of a notice of a conviction of any employee; and,

Taking appropriate personnel action against an employee convicted of violating a criminal drug statue or requires such employee to participate in a drug abuse assistance or rehabilitation program.

Name of Organization/Contractor(s):

__Roadway Asset Services, LLC__

Signature of Authorized Representative:

Bat Will

Date: __2/17/2023__

ATTACHMENT VI:
CERTIFICATION REGARDING DISCLOSURE OF CONFLICT OF INTEREST

The undersigned certifies that, to the best of his or her knowledge or belief, that:

"No employee of the contractor, no member of the contractor's governing board or body, and no person who exercises any functions or responsibilities in the review or approval of the undertaking or carrying out of this contract shall participate in any decision relating to this contract which affects his/her personal pecuniary interest.

Executives and employees of contractor shall be particularly aware of the varying degrees of influence that can be exerted by personal friends and associates and, in administering the contract, shall exercise due diligence to avoid situations which give rise to an assertion that favorable treatment is being granted to friends and associates. When it is in the public interest for the contractor to conduct business with a friend or associate of an executive or employee of the contractor, an elected official in the area or a member of the North Central Texas Council of Governments, a permanent record of the transaction shall be retained.

Any executive or employee of the contractor, an elected official in the area or a member of the NCTCOG, shall not solicit or accept money or any other consideration from a third person, for the performance of an act reimbursed in whole or part by contractor or Department. Supplies, tools, materials, equipment or services purchased with contract funds shall be used solely for purposes allowed under this contract. No member of the NCTCOG shall cast a vote on the provision of services by that member (or any organization which that member represents) or vote on any matter which would provide a direct or indirect financial benefit to the member or any business or organization which the member directly represents".

No officer, employee or paid consultant of the contractor is a member of the NCTCOG.

No officer, manager or paid consultant of the contractor is married to a member of the NCTCOG.

No member of NCTCOG directly owns, controls or has interest in the contractor.

The contractor has disclosed any interest, fact, or circumstance that does or may present a potential conflict of interest.

No member of the NCTCOG receives compensation from the contractor for lobbying activities as defined in Chapter 305 of the Texas Government Code.

Should the contractor fail to abide by the foregoing covenants and affirmations regarding conflict of interest, the contractor shall not be entitled to the recovery of any costs or expenses incurred in relation to the contract and shall immediately refund to the North Central Texas Council of Governments any fees or expenses that may have been paid under this contract and shall further be liable for any other costs incurred or damages sustained by the NCTCOG as it relates to this contract.

Name of Organization/Contractor(s):

Roadway Asset Services, LLC

Signature of Authorized Representative:

Date: 2/17/2023

CONFLICT OF INTEREST QUESTIONNAIRE

For vendor doing business with local governmental entity

FORM CIQ

This questionnaire reflects changes made to the law by H.B. 23, 84th Leg., Regular Session.	**OFFICE USE ONLY**

This questionnaire is being filed in accordance with Chapter 176, Local Government Code, by a vendor who has a business relationship as defined by Section 176.001(1-a) with a local governmental entity and the vendor meets requirements under Section 176.006(a).

Date Received

By law this questionnaire must be filed with the records administrator of the local governmental entity not later than the 7th business day after the date the vendor becomes aware of facts that require the statement to be filed. *See* Section 176.006(a-1), Local Government Code.

A vendor commits an offense if the vendor knowingly violates Section 176.006, Local Government Code. An offense under this section is a misdemeanor.

1 **Name of vendor who has a business relationship with local governmental entity.**

Roadway Asset Services, LLC

2 ☐ **Check this box if you are filing an update to a previously filed questionnaire.** (The law requires that you file an updated completed questionnaire with the appropriate filing authority not later than the 7th business day after the date on which you became aware that the originally filed questionnaire was incomplete or inaccurate.)

3 **Name of local government officer about whom the information is being disclosed.**

Not Applicable
_____
Name of Officer

4 **Describe each employment or other business relationship with the local government officer, or a family member of the officer, as described by Section 176.003(a)(2)(A). Also describe any family relationship with the local government officer. Complete subparts A and B for each employment or business relationship described. Attach additional pages to this Form CIQ as necessary.**

A. Is the local government officer or a family member of the officer receiving or likely to receive taxable income, other than investment income, from the vendor?

☐ Yes ☑ No

B. Is the vendor receiving or likely to receive taxable income, other than investment income, from or at the direction of the local government officer or a family member of the officer AND the taxable income is not received from the local governmental entity?

☐ Yes ☑ No

5 **Describe each employment or business relationship that the vendor named in Section 1 maintains with a corporation or other business entity with respect to which the local government officer serves as an officer or director, or holds an ownership interest of one percent or more.**

Not Applicable

6 ☐ Check this box if the vendor has given the local government officer or a family member of the officer one or more gifts as described in Section 176.003(a)(2)(B), excluding gifts described in Section 176.003(a-1).

7

Bart Willis _____   02/17/2023
Signature of vendor doing business with the governmental entity   Date

CONFLICT OF INTEREST QUESTIONNAIRE
For vendor doing business with local governmental entity

A complete copy of Chapter 176 of the Local Government Code may be found at http://www.statutes.legis.state.tx.us/Docs/LG/htm/LG.176.htm. For easy reference, below are some of the sections cited on this form.

Local Government Code § 176.001(1-a): "Business relationship" means a connection between two or more parties based on commercial activity of one of the parties. The term does not include a connection based on:
    (A) a transaction that is subject to rate or fee regulation by a federal, state, or local governmental entity or an agency of a federal, state, or local governmental entity;
    (B) a transaction conducted at a price and subject to terms available to the public; or
    (C) a purchase or lease of goods or services from a person that is chartered by a state or federal agency and that is subject to regular examination by, and reporting to, that agency.

Local Government Code § 176.003(a)(2)(A) and (B):
    (a) A local government officer shall file a conflicts disclosure statement with respect to a vendor if:
        ***
        (2) the vendor:
            (A) has an employment or other business relationship with the local government officer or a family member of the officer that results in the officer or family member receiving taxable income, other than investment income, that exceeds $2,500 during the 12-month period preceding the date that the officer becomes aware that
                (i) a contract between the local governmental entity and vendor has been executed; or
                (ii) the local governmental entity is considering entering into a contract with the vendor;
            (B) has given to the local government officer or a family member of the officer one or more gifts that have an aggregate value of more than $100 in the 12-month period preceding the date the officer becomes aware that:
                (i) a contract between the local governmental entity and vendor has been executed; or
                (ii) the local governmental entity is considering entering into a contract with the vendor.

Local Government Code § 176.006(a) and (a-1)
    (a) A vendor shall file a completed conflict of interest questionnaire if the vendor has a business relationship with a local governmental entity and:
        (1) has an employment or other business relationship with a local government officer of that local governmental entity, or a family member of the officer, described by Section 176.003(a)(2)(A);
        (2) has given a local government officer of that local governmental entity, or a family member of the officer, one or more gifts with the aggregate value specified by Section 176.003(a)(2)(B), excluding any gift described by Section 176.003(a-1); or
        (3) has a family relationship with a local government officer of that local governmental entity.
    (a-1) The completed conflict of interest questionnaire must be filed with the appropriate records administrator not later than the seventh business day after the later of:
        (1) the date that the vendor:
            (A) begins discussions or negotiations to enter into a contract with the local governmental entity; or
            (B) submits to the local governmental entity an application, response to a request for proposals or bids, correspondence, or another writing related to a potential contract with the local governmental entity; or
        (2) the date the vendor becomes aware:
            (A) of an employment or other business relationship with a local government officer, or a family member of the officer, described by Subsection (a);
            (B) that the vendor has given one or more gifts described by Subsection (a); or
            (C) of a family relationship with a local government officer.

ATTACHMENT VII:
CERTIFICATION OF FAIR BUSINESS PRACTICES

That the submitter has not been found guilty of unfair business practices in a judicial or state agency administrative proceeding during the preceding year. The submitter further affirms that no officer of the submitter has served as an officer of any company found guilty of unfair business practices in a judicial or state agency administrative during the preceding year.

Name of Organization/Contractor(s):

Roadway Asset Services, LLC

Signature of Authorized Representative:

Date: 2/17/2023

ATTACHMENT VIII:
CERTIFICATION OF GOOD STANDING
TEXAS CORPORATE FRANCHISE TAX CERTIFICATION

Pursuant to Article 2.45, Texas Business Corporation Act, state agencies may not contract with for profit corporations that are delinquent in making state franchise tax payments. The following certification that the corporation entering into this offer is current in its franchise taxes must be signed by the individual authorized on Form 2031, Corporate Board of Directors Resolution, to sign the contract for the corporation.

The undersigned authorized representative of the corporation making the offer herein certified that the following indicated Proposal is true and correct and that the undersigned understands that making a false Proposal is a material breach of contract and is grounds for contract cancellation.

Indicate the certification that applies to your corporation:

_____X_____   The Corporation is a for-profit corporation and certifies that it is not delinquent in its franchise tax payments to the State of Texas.

_____   The Corporation is a non-profit corporation or is otherwise not subject to payment of franchise taxes to the State of Texas.

Type of Business (if not corporation):   ☐   Sole Proprietor

                                               ☒   Partnership

                                               ☐   Other

Pursuant to Article 2.45, Texas Business Corporation Act, the North Central Texas Council of Governments reserves the right to request information regarding state franchise tax payments.

  Bart Williamson, CEO
_____
(Printed/Typed Name and Title of Authorized Representative)

_Bart Will_____
Signature

Date:___2/17/2023_____

HISTORICALLY UNDERUTILIZED BUSINESSES, MINORITY OR WOMEN-OWNED OR DISADVANTAGED BUSINESS ENTERPRISES

Historically Underutilized Businesses (HUBs), minority or women-owned or disadvantaged businesses enterprises (M/W/DBE) are encouraged to participate in the solicitation process. Representatives from HUB companies should identify themselves and submit a copy of their certification.

NCTCOG recognizes the certifications of both the State of Texas Program and the North Central Texas Regional Certification Agency. Companies seeking information concerning HUB certification are urged to contact:

>State of Texas HUB Program
>Texas Comptroller of Public Accounts
>Lyndon B. Johnson State Office Building
>111 East 17th Street
>Austin, Texas 78774
>(512) 463-6958
>http://www.window.state.tx.us/procurement/prog/hub/

Local businesses seeking M/W/DBE certification should contact:

>North Central Texas Regional Certification Agency
>624 Six Flags Drive, Suite 100
>Arlington, TX 76011
>(817) 640-0606
>http://www.nctrca.org/certification.html

Submitter must include a copy of its minority certification documentation as part of this solicitation. If your company is already certified, attach a copy of your certification to this form and return with your proposal.

Indicate all that apply:

_____Minority-Owned Business Enterprise

_____Women-Owned Business Enterprise   Not Applicable

_____Disadvantaged Business Enterprise

ATTEST TO Attachments of Certification:

_____
Authorized Signature

_____   _____
Typed Name   Date
_____
Subscribed and sworn to before me this _____day of _____ (month), 20__ in

_____ (city), _____ (county), _____ (state).

                                                           SEAL
Notary Public in and for _____ (County),
                State of _____ Commission expires: _____

ATTACHMENT X
ATTESTATION OF CONTRACTS NULLIFYING ACTIVITY

The following provisions are mandated by Federal and/or State of Texas law. Failure to certify to the following will result in disqualification of consideration for contract. Entities or agencies that are not able to comply with the following will be ineligible for consideration of contract award.

PROHIBITED TELECOMMUNICATIONS AND VIDEO SURVEILLANCE SERVICES OR EQUIPMENT CERTIFICATION

This Contract is subject to the Public Law 115-232, Section 889, and 2 Code of Federal Regulations (CFR) Part 200, including §200.216 and §200.471, for prohibition on certain telecommunications and video surveillance or equipment.

Public Law 115-232, Section 889, identifies that restricted telecommunications and video surveillance equipment or services (e.g. phones, internet, video surveillance, cloud servers) include the following:

A) Telecommunications equipment that is produced by Huawei Technologies Company or ZTE Corporation (or any subsidiary or affiliates of such entities).

B) Video surveillance and telecommunications equipment produced by Hytera Communications Corporations, Hangzhou Hikvision Digital Technology Company, or Dahua Technology Company (or any subsidiary or affiliates of such entities).

C) Telecommunications or video surveillance services used by such entities or using such equipment.

D) Telecommunications or video surveillance equipment or services produced or provided by an entity that the Secretary of Defense, Director of the National Intelligence, or the Director of the Federal Bureau of Investigation reasonably believes to be an entity owned or controlled by the government of a covered foreign country.

The entity identified below, through its authorized representative, hereby certifies that no funds under this Contract will be obligated or expended to procure or obtain telecommunication or video surveillance services or equipment or systems that use covered telecommunications equipment or services as a substantial or essential component of any system, or as a critical technology as part of any system prohibited by 2 CFR §200.216 and §200.471, or applicable provisions in Public Law 115-232 Section 889.

☒ The Contractor or Subrecipient hereby certifies that it does comply with the requirements of 2 CFR §200.216 and §200.471, or applicable regulations in Public Law 115-232 Section 889.

SIGNATURE OF AUTHORIZED PERSON: _____

NAME OF AUTHORIZED PERSON: _____ Bart Williamson _____

NAME OF COMPANY: _____ Roadway Asset Services, LLC _____

DATE: _____ 2/17/2023 _____

-OR-

☐ The Contractor or Subrecipient hereby certifies that it cannot comply with the requirements of 2 CFR §200.216 and §200.471, or applicable regulations in Public Law 115-232 Section 889.

SIGNATURE OF AUTHORIZED PERSON: _____

NAME OF AUTHORIZED PERSON: _____

NAME OF COMPANY: _____

DATE: _____

EXHIBIT A
Service Area Designation Forms

RFP 2022-063	Texas Service Area Designation or Identification		
Respondent Name:	Roadway Asset Services, LLC		
Notes:	**Indicate in the appropriate box whether you are proposing to service the entire State of Texas**		
	Will service the entire State of Texas	Will not service the entire State of Texas	
	X		
	If you are not proposing to service the entire State of Texas, designate on the form below the regions that you are proposing to provide goods and/or services to. By designating a region or regions, you are certifying that you are willing and able to provide the proposed goods and services.		
Item	**Region**	**Metropolitan Statistical Areas**	**Designated Service Area**
1.	North Central Texas	16 counties in the Dallas-Fort Worth Metropolitan area	
2.	High Plains	Amarillo Lubbock	
3.	Northwest	Abilene Wichita Falls	
4.	Upper East	Longview Texarkana, TX-AR Metro Area Tyler	
5.	Southeast	Beaumont-Port Arthur	
6.	Gulf Coast	Houston-The Woodlands-Sugar Land	
7.	Central Texas	College Station-Bryan Killeen-Temple Waco	
8.	Capital Texas	Austin-Round Rock	
9.	Alamo	San Antonio-New Braunfels Victoria	
10.	South Texas	Brownsville-Harlingen Corpus Christi Laredo McAllen-Edinburg-Mission	
11.	West Texas	Midland Odessa San Angelo	
12.	Upper Rio Grande	El Paso	

RFP 2022-063	Nationwide Service Area Designation or Identification Form		
Respondent Name:	Roadway Asset Services, LLC		
Notes:	**Indicate in the appropriate box whether you are proposing to provide service to all Fifty (50) States.**		
	Will service all Fifty (50) States	Will not service Fifty (50) States	
	X		
	If you are not proposing to service to all Fifty (50) States, then designate on the form below the States that you will provide service to. By designating a State or States, you are certifying that you are willing and able to provide the proposed goods and services in those States. **If you are only proposing to service a specific region, metropolitan statistical area (MSA), or city in a State, then indicate as such in the appropriate column box.**		

Item	State	Region/MSA/City	Designated as a Service Area
1.	Alabama		
2.	Alaska		
3.	Arizona		
4.	Arkansas		
5.	California		
6.	Colorado		
7.	Connecticut		
8.	Delaware		
9.	Florida		
10.	Georgia		
11.	Hawaii		
12.	Idaho		
13.	Illinois		
14.	Indiana		
15.	Iowa		
16.	Kansas		
17.	Kentucky		
18.	Louisiana		
19.	Maine		
20.	Maryland		
21.	Massachusetts		

22.	Michigan		
23.	Minnesota		
24.	Mississippi		
25.	Missouri		
26.	Montana		
27.	Nebraska		
28.	Nevada		
29.	New Hampshire		
30.	New Jersey		
31.	New Mexico		
32.	New York		
33.	North Carolina		
34.	North Dakota		
35.	Ohio		
36.	Oregon		
37.	Oklahoma		
38.	Pennsylvania		
39.	Rhode Island		
40.	South Carolina		
41.	South Dakota		
42.	Tennessee		
43.	Texas		
44.	Utah		
45.	Vermont		
46.	Virginia		
47.	Washington		
48.	West Virginia		
49.	Wisconsin		
50.	Wyoming		

EXHIBIT B
Description of Desired Services for Proposed Pricing

Responses to this Exhibit should be addressed in Tab D: Technical Proposal.

Respondents should furnish a proposal that specifies pricing (as **Exhibit D**) for the services they propose.

Responses are encouraged from vendors who can only provide a handful of products and services. Respondents are not expected to be able to provide the entirety of the desired services, though are welcome to if they are able!

The following categories of pavement analysis services comprise the essential elements of the desired services:
- Pavement Data Collection
- Asset Inventory
- Pavement Management Analysis
- Electronic Products
- Pavement Structural Analysis
- GIS Related Services
- Value Added Services

Service Category #1: Pavement Data Collection
Respondents should detail their specific skill sets and/or range of capabilities for carrying out the following related activities in their proposal for Service Category #1:

1. Automatically and continuously measure pavement cracking, texture, rutting and geometrics. Equipment used for rut measurement shall be capable of measuring both wheel track ruts simultaneously.

2. Collect pavement surface distress and structural condition information through automated means for all Participant-owned roadways.

3. Provide a customized digital condition rating system to collect user defined severity/extent-based pavement distresses and pertinent roadway attributes to accommodate a standardized approach to collecting data.

4. Collect dual-wheel path roughness data to International Roughness Index standards.

5. Collect pavement performance information that includes rutting using a minimum of seven (7) sensors (include pricing for nine (9) sensors as well), fatigue cracking, transverse cracking using a minimum of four (4) sensors, and longitudinal cracking

6. Perform friction testing

7. Measure lane striping reflectivity quality

Service Category #2- Asset Inventory:
Respondents should detail their specific skill sets and/or range of capabilities for carrying out the following related activities in their proposal for Service Category #2:

8. Collect sidewalk data to include location, length, width, location in relation to curb and if greenspaces exist between curb and sidewalk, and sidewalk condition to create shapefiles (.shp) for incorporation into the Participant's GIS system, if applicable.

9. Collect sidewalk Barrier Free Ramp data to include location, configuration, presence of truncated domes or other detectable warning feature, and condition and create shapefiles (.shp) for incorporation into the Participant's GIS system, if applicable.

10. Collect roadway sign data to include type and location and create shapefiles (.shp) for incorporation into the Participant's GIS system, if applicable.

11. Collect photos of Barrier Free Ramps, sidewalks, curb condition, drive approach, and/or roadway signs inventoried under items 8, 9, and 10 above.

12. Collect location of curb and gutter and create shapefiles (.shp) for incorporation into the Participant's GIS system, if applicable.

13. Collect location and type of visible in-pavement features such as valves, manhole covers, etc. and create shapefiles (.shp) for incorporation into the Participant's GIS system, if applicable.

14. Collect locations of trees, including height and spread

15. Collect bike lane locations, including width, length, and associated signage and striping.

16. Utilize Ground Penetrating Radar for relocating utilities (for maintenance plans).

17. Collect data on location and surface condition of bridge approaches

18. Collect information on bridge deck condition

19. Perform Parking Lot Pavement Condition Assessment (Thru-Travel Lanes) w/ Inventory, Attribute, & Geodatabase Development

20. Right of Way Assets Database Development (GPS & Camera Configuration):
    a.   Sign & Support Database Development
    b.   Markings & Striping Database Development
    c.   Traffic Signals/ Flashers. Controllers Database Development
    d.   Street Lights Database Development
    e.   Drop Inlets Database Development
    f.   Drivepads Database Development
    g.   Bridges Database Development
    h.   Speed Humps Database Development
    i.   Street Furniture Database Development
    j.   Cattle Guards Database Development
    k.   Guardrails & Roadside Pedestrian Fence Database Development
    l.   Culverts and Ditches
    m.   Cabinets
    n.   Utility Poles
    o.   Fire Hydrant
    p.   Medians Database
    q.   Valves
    r.   Manhole Covers
    s.   Trees
    t.   Catch Basins/ Drainage Inlets from Master Drainage Plan
    u.   Sidewalk Database Development
    v.   Curb & Gutter Database Development

Service Category #3- Pavement Management Analysis:
Respondents should detail their specific skill sets and/or range of capabilities for carrying out the following related activities in their proposal for Service Category #3:

21. Calculate the International Roughness Index (IRI) for each road segment in accordance with ASTM E1926. Provide results compatible with the Participant's GIS database, if applicable.

22. Calculate a Pavement Condition Index (PCI) score for each road segment using an approved pavement management system and in accordance with ASTM D6433 or ASTM E3303. Provide results compatible with the Participant's GIS database, if applicable.

23. With input from Participant's staff, devise a weighing system taking into account PCI, IRI, average daily traffic for thoroughfares (traffic count raw data provided by Participant), public safety emergency routes, and apply this 0-100 numeric index to the roadway information

collected for the entire jurisdiction. Provide results compatible with the Participant's GIS database, if applicable.

24. Estimate the annual budget required to meet the long-term goals regarding desired pavement condition levels.

25. Create a five-year and ten-year pavement rehabilitation plan with input from Participant's staff.

26. Recommend the computer hardware and software needed for successful implementation, potentially including recommendations for licenses of pavement management system software and other geodatabase software as needed.

27. Train Participant staff and provide assistance to the Public Works and IT Department as needed for the use of data collected through the fully automated system.

Service Category #4: Electronic Products
Respondents should detail their specific skill sets and/or range of capabilities for carrying out the following related activities in their proposal for Service Category #4:

28. Roadway information that shall be collected and provided to the Participant at a minimum includes:

    a. Street Name
    b. Endpoint One, Endpoint Two, and Segment ID
    c. Segment Length and Pavement Width
    d. Inventory Date
    e. Pavement Type
    f. Segment Functional Classification
    g. Pavement condition scored depending on the requirements of local government Participant(s) (Example: Pavement condition scored as one of the MicroPaver 19 surface distress codes with corresponding unit of measure scored every 100 feet longitudinally)
    h. Pavement performance information that includes rutting, fatigue cracking, transverse cracking, and longitudinal cracking
    i. Pavement age (if necessary to develop pavement life curves)

29. Collect digital images at 25-foot intervals of the road surface condition and link to a geodatabase (minimum forward facing imagery).

30. Load assessment data for all Participant-maintained pavements into a pavement management system required by local government Participant(s), if applicable. (Example: MicroPaver). The assessment data shall include visual observations, photographs and measurements collected by instrumentation.

31. Implement map module so that pavement condition and other data can be integrated, displayed, and accessed through the map interface in a format consistent with the Participant's horizontal and vertical control network system, if applicable.

32. Provide to the Participant the pavement condition data in a pavement management system database approved by Participant. Coordinate with the Participant's IT department to provide pavement condition data in a format compatible with the Participant's Environmental Systems Research Institute (ESRI) GIS database, if applicable.

33. Asset management tools or systems (not just collection) (i.e. 15-year plan about how to fix or repair assets).

Service Category #5- Pavement Structural Analysis:
Respondents should detail their specific skill sets and/or range of capabilities for carrying out the following related activities in their proposal for Service Category #5:

34. Collect and analyze pavement structural condition information through the use of a falling weight deflectometer in accordance with industry standards on designated participant-owned roadways.

35. Collect and analyze pavement structural condition information through the use of Ground Penetrating Radar (GPR) in accordance with industry standards on designated participant-owned roadways.

36. Collect and analyze pavement structural condition information through the use of pavement cores in accordance with industry standards on designated participant-owned roadways (traffic control included).

Service Category #6- GIS Related Services:
Respondents should detail their specific skill sets and/or range of capabilities for carrying out the Following related activities in their proposal for Service Category #6:

37. GIS Clean-Up Services

38. GIS Support Services

39. GIS Remote Training Sessions from GIS Manager/ Expert (2-Hour Sessions)

Service Category #7- Value Added Services:
Respondents should detail their specific skill sets and/or range of capabilities for carrying out the following related activities in their proposal for Service Category #7:

40. Full Written Final Report- Firm shall prepare and submit a written project report summarizing the work performed, dates of collection, methodology, and results.

41. Project Presentation- Firm shall prepare and present a written project report summarizing the work performed, dates of collection, methodology, and results to the Participant's legislative body.

42. Provide Curb Ramp and ADA/Barrier Free Ramp Compliance Survey.

43. Stand-alone field operation for collection of asset inventory only, with different levels of position accuracy and abilities to use data for attribute registration and conditions.
    a. Photogrammetry
    b. Mobile Lidar

44. Generic asset types, allowing for any item within line of sight of the collection vehicle.
    a. Above ground point asset
    b. Above ground linear asset
    c. At grade point asset
    d. At grade linear asset

45. Provide consultancy services to develop linework in GIS for missing sidewalks in order to quantify and identify on a map.

The awarded Contractor(s) shall provide all necessary field inspectors, vehicles, tools, equipment, traffic control and other services required to perform this work. No engineering services are available under this contact. Any activities that Participant and/or Contractor deem to require the service(s) of an engineer must be procured separately and are the sole responsibility of that party.

EXHIBIT C
Service Questionnaire

Respondents are encouraged to consider that cooperative contracts are able to be offered to any public-sector agency that can benefit from them, anywhere in the nation.

For any or all of their services, respondents may therefore provide a percentage discount off of catalog pricing. A 0% discount must still be denoted on the line item(s) with the number zero. Respondents are **not** required to propose a discount.

Indicate the services you are able to offer, as well as any proposed discounts. If you are not proposing a percentage-discount, please mark that field N/A.

Category #	Description	Yes	No	Proposed % Discount
1	Pavement Data Collection	✓		10 %
2	Asset Inventory Management	✓		10 %
3	Pavement Management Analysis	✓		10 %
4	Electronic Products	✓		10 %
5	Pavement Structural Evaluations	✓		10 %
6	GIS Related Services	✓		15 %
7	Value Added Services	✓		10 %

Respondents should address the following items in Tab D: Technical Proposal if they are applicable for the service(s) being proposed.

- Respondents are asked to identify services that they are able to provide.
- Respondents are not required to be able to respond to all services in order to provide a proposal to this RFP.
- Those Respondents that are capable of providing more than a single service, indicate which in the table above, and provide an individual narrative relating to the needs of each Service Category as described in Exhibit B.
- Responses should consist of detailed descriptions of what a Respondent's firm is capable of providing to the TXShare Public Purchasing Cooperative. The numbered activities in each Service Category must be addressed, but Respondents are encouraged to provide additional detail about their operation and capabilities.
- Respondents who wish to propose additional services or pavement analysis services are encouraged to do so by attaching additional (as many as necessary) to describe said products or services and their associated pricing structures.

Note: Respondent is not required to complete any questions that are not applicable to the services you are bidding.

EXHIBIT D
Pricing Proposal/Attachment A Instructions

Submissions must include Attachment A, RFP 2022-063 Pricing Proposal Form, which is located on the Public Purchase project page. Respondents may provide pricing that is the most compatible with their business model if they maintain consideration for geographic coverage for TXSHARE participants and evolution of the service throughout the contract lifecycle

Attachment A contains predetermined criteria for your firm to price. Respondents are to provide tiered pricing based on the base cost and/or range of lane miles for each numbered pavement analysis and related services activity.

**Respondents must not include mobilization fees in their pricing and may not include them in any contract(s) that result from this RFP.

If a respondent elects to submit a percentage discount off their catalog pricing for any or all of their services, the corresponding price for each numbered activity listed in Attachment A must account for the proposed discount listed in Exhibit C. If you are not proposing a percentage-discount, please use your established list price for each numbered pavement analysis and related services activity.

Example: If your catalog price is $100 per unit, and you indicate a 5% discount from catalog pricing in Exhibit C, your pricing form in Attachment A should reflect a unit price of $95. Conversely, if your catalog price is $100 per unit, and you indicate a 0% discount or N/A in Exhibit C, your pricing form in Attachment A should reflect a unit price of $100.

CERTIFICATE OF INTERESTED PARTIES

FORM 1295

1 of 1

Complete Nos. 1 - 4 and 6 if there are interested parties.
Complete Nos. 1, 2, 3, 5, and 6 if there are no interested parties.

1 **Name of business entity filing form, and the city, state and country of the business entity's place of business.**

Roadway Asset Services, LLC

Austin, TX United States

2 **Name of governmental entity or state agency that is a party to the contract for which the form is being filed.**

North Central Texas Council of Governments

3 **Provide the identification number used by the governmental entity or state agency to track or identify the contract, and provide a description of the services, goods, or other property to be provided under the contract.**

RFP 2022-063

Pavement Analysis and Related Services

4 **Name of Interested Party**	**City, State, Country (place of business)**	**Nature of interest (check applicable)**	
		Controlling	**Intermediary**
Williamson, Bart	Austin, TX United States	X	
Gordon, Scot	Austin, TX United States	X	
Rivera, Rafael	Austin, TX United States	X	
Thomason , Zachary	Austin, TX United States	X	
Kramer, Mark	Austin, TX United States	X	

5 **Check only if there is NO Interested Party.** ☐

6 **UNSWORN DECLARATION**

My name is _____Bart Williamson_____, and my date of birth is _____11/02/1966_____.

My address is _____7913 Turnback Ledge Trail_____, _____Lago Vista_____, _TX_, _78645_, _US_.
(street) (city) (state) (zip code) (country)

I declare under penalty of perjury that the foregoing is true and correct.

Executed in _____Travis_____ County, State of _____Texas_____, on the _16_ day of _February_, 20_23_.
(month) (year)

_____
Signature of authorized agent of contracting business entity
(Declarant)

DISCRIMINATION AGAINST FIREARMS ENTITIES OR FIREARMS TRADE ASSOCIATIONS

This contract is subject to the Texas Local Government Code chapter 2274, Subtitle F, Title 10, prohibiting contracts with companies who discriminate against firearm and ammunition industries.

TLGC chapter 2274, Subtitle F, Title 10, identifies that "discrimination against a firearm entity or firearm trade association" includes the following:

A) means, with respect to the entity or association, to:
    I.   refuse to engage in the trade of any goods or services with the entity or association based solely on its status as a firearm entity or firearm trade association; and
    II.   refrain from continuing an existing business relationship with the entity or association based solely on its status as a firearm entity or firearm trade association; or
    III.   terminate an existing business relationship with the entity or association based solely on its status as a firearm entity or firearm trade association.

B) An exception to this provision excludes the following:
    I.   contracts with a sole-source provider; or
    II.   the government entity does not receive bids from companies who can provide written verification.

The entity identified below, through its authorized representative, hereby certifies that they have no practice, policy, guidance, or directive that discriminates against a firearm entity or firearm trade association; and that they will not discriminate during the term of the contract against a firearm entity or firearm trade association as prohibited by Chapter 2274, Subtitle F, Title 10 of the Texas Local Government Code.

☑ The Contractor or Subrecipient hereby certifies that it does comply with the requirements of Chapter 2274, Subtitle F, Title 10.

SIGNATURE OF AUTHORIZED PERSON: _Bart Williamson_

NAME OF AUTHORIZED PERSON: Bart Williamson

NAME OF COMPANY: Roadway Asset Services, LLC

DATE: 2/17/2023

-OR-

☐ The Contractor or Subrecipient hereby certifies that it cannot comply with the requirements of Chapter 2274, Subtitle F, Title 10.

SIGNATURE OF AUTHORIZED PERSON: _____

NAME OF AUTHORIZED PERSON: _____

NAME OF COMPANY: _____

DATE: _____

BOYCOTTING OF CERTAIN ENERGY COMPANIES

This contract is subject to the Texas Local Government Code chapter 809, Subtitle A, Title 8, prohibiting contracts with companies who boycott certain energy companies.

TLGC chapter Code chapter 809, Subtitle A, Title 8, identifies that "boycott energy company" means, without an ordinary business purpose, refusing to deal with, terminating business activities with, or otherwise taking any action that is intended to penalize, inflict economic harm on, or limit commercial relations with a company because the company:

    I.   engages in the exploration, production, utilization, transportation, sale, or manufacturing of fossil fuel-based energy and does not commit or pledge to meet environmental standards beyond applicable federal and state law; and

    II.   does business with a company described by paragraph (I).

The entity identified below, through its authorized representative, hereby certifies that they do not boycott energy companies, and that they will not boycott energy companies during the term of the contract as prohibited by Chapter 809, Subtitle A, Title 8 of the Texas Local Government Code.

☑ The Contractor or Subrecipient hereby certifies that it does comply with the requirements of Chapter 809, Subtitle A, Title 8.

SIGNATURE OF AUTHORIZED PERSON: _Bart Willi_____

NAME OF AUTHORIZED PERSON:

    Bart Williamson

NAME OF COMPANY:

    Roadway Asset Services, LLC

DATE:

    2/17/2023

-OR-

☐ The Contractor or Subrecipient hereby certifies that it cannot comply with the requirements of Chapter 809, Subtitle A, Title 8.

SIGNATURE OF AUTHORIZED PERSON: _____

NAME OF AUTHORIZED PERSON: _____

NAME OF COMPANY: _____

DATE: _____

House Bill 89 Verification Form

Prohibition on Contracts with Companies Boycotting Israel

The 85th Texas Legislature approved new legislation, effective Sept. 1, 2017, which amends Texas Local Government Code Section 1. Subtitle F, Title 10, Government Code by adding Chapter 2270 which states that a governmental entity may not enter into a contract with a company for goods or services unless the contract contains a written verification from the company that it:

1) does not boycott Israel; and
2) will not boycott Israel during the term of the contract

Pursuant to Section 2270.001, Texas Government Code:

1. "Boycott Israel" means refusing to deal with, terminating business activities with, or otherwise taking any action that is intended to penalize, inflict economic harm on, or limit commercial relations specifically with Israel, or with a person or entity doing business in Israel or in an Israeli-controlled territory, but does not include an action made for ordinary business purposes; and

2. "Company" means a for-profit sole proprietorship, organization, association, corporation, partnership, joint venture, limited partnership, limited liability partnership, or any limited liability company, including a wholly owned subsidiary, majority-owned subsidiary, parent company or affiliate of those entities or business associations that exist to make a profit.

I, (authorized official) _____ **Bart Williamson** _____, do hereby depose and verify the truthfulness and accuracy of the contents of the statements submitted on this certification under the provisions of Subtitle F, Title 10, Government Code Chapter 2270 and that the company named below:

1) does not boycott Israel currently; and
2) will not boycott Israel during the term of the contract; and
3) is not currently listed on the State of Texas Comptroller's Companies that Boycott Israel List located at https://comptroller.texas.gov/purchasing/publications/divestment.php

Roadway Asset Services, LLC
_____
Company Name

_____
Signature of Authorized Official

Chief Executive Officer _____ 02/17/23 _____
Title of Authorized Official   Date

North ⚙ Texas
SHARE
Your Public Sector Solutions Center

**ADDENDUM TO THE
REQUEST FOR PROPOSALS
Pavement Analysis and Related Services**

ADDENDUM NO. 1   DATE ISSUED: February 14, 2023

**REQUEST FOR PROPOSALS NUMBER: NCT-2022-063
ORIGINAL RFP SUBMISSION DATE: February 21, 2023
REVISED RFP SUBMISSION DATE: February 24, 2023 (Revised)**

RFP NCT-2022-063, dated January 20, 2023, is hereby amended to incorporate in full text the following provisions:

Section 1.1: Purpose
Section 1.1, Paragraph Two is hereby struck and replaced with the following:

> Qualified respondents must be able to conduct, instruct, and/or implement Pavement Analysis Analyses and/or Asset Management Inventory for publicly-maintained roadways, including arterial and collector streets, streets with concrete, asphalt, and/or dirt/gravel, and alleyways. Qualified Respondents must also be able to conduct surveys of sidewalk networks and ADA ramps, if applicable. Qualified firms are invited to submit proposals, based on the information provided in this RFP. NCTCOG intends to establish one or more contracts that will maximize the resources of all parties to most effectively meet the needs of NCTCOG and public sector entities of the TXShare Cooperative.

Section 4.5 Proposal Evaluation Criteria
Typographical Error – The "Description" field for Technical Proposal lists a total of "0%" as the maximum points. This is hereby corrected to 30% to match the data to the right in the 'Points' field.

Attachment A – Price Proposal
Service Category II – Asset Inventory: Unit modification from "each" to "lane mile". Items 9, 10, 11, 13, and 14 are hereby so modified. Attachment A has been updated in Public Purchase as Attachment A Revised. Please utilize this document for your proposal purposes.

Questions and Answers

The following questions were submitted by potential proposers and are answered below. Questions are indicated by standard type and answers indicated by **bold-face type.**

Question #1
Must the vendors provide services using a van? What if we have an alternative type of collection, like using vehicles that are already on the road?

Answer 1: As long as your collection method meets the standard described within the RFP, it should not be a disqualifying factor.

Question #2
Mobilization is not anticipated in this RFP, isn't that correct?

Answer 2: That is correct – mobilization fees are not to be included in this offering.

Question #3
Don't activities in Service Category 3 constitute engineering services?

Answer 3: No, those do not.

Question #4
there are multiple service areas you can select which ones you're going to respond to and tabs B there's an executive summary. I would assume that would be an overarching, but some of the Tab D specifically technical proposal. Would there be a tab for each service area that one is proposing, or would there be a tab that covers all service areas that one is proposing on?
Answer 4: Please provide a single Attachment A for all service areas you are able to provide to. Please be advised that you may provide services wherever you are capable fo doing so – but you are not obligated to service areas simply because you've listed them on your RFP response. For example, if your Firm cannot provide services today in Washington State, but you identify that you will service all 50 states because you anticipate expansion in the future – that is fine. You cannot be obligated to perform services in an area that you are not physically present in, but it may be a benefit to have that option during the multiple-year long term of the contract.

Question #5
In regards to Service Category 1, #1. Can you define what is meant by "geometrics"?

[Automatically and continuously measure pavement cracking, texture, rutting and geometrics. Equipment used for rut measurement shall be capable of measuring both wheel track ruts simultaneously.]

Answer 5: "Geometrics" refers to the dimensions and arrangements of roadway features, including, but not limited to, width, presence of curb, shoulders, and intersections.

Question #6
In regards to category 4, #28. After the bid is awarded, can the selected vendor(s) receive historical data on inventory date and pavement age?

Answer 6: Existing TxShare Member Entities who are former consumers of this project may elect to provide their historical data to any awarded firm that they select to provide services. The NCTCOG does not possess or maintain any data related to the delivery of Pavement Analysis services delivered to TxShare Member Entities under these contracts.

Question #7
In regards to category 7, #44. What is meant by point asset vs. linear asset?

1.   [From Exhibit B in narrative: Generic asset types, allowing for any item within line of sight of the collection vehicle.

   a. Above ground point asset

   b. Above ground linear asset

   c. At grade point asset

   d. At grade linear asset]

Answer 7: A point asset exists in one location and does not extend to an additional location. An example would be a stop sign. A linear asset extends between multiple points. An example would be striping.

Question #8
Is a Texas engineering registration required to submit a proposal or is this something we can acquire after award?

Answer 8: Engineering services are not included as a part of this solicitation or any resulting Master Services Agreement.

Question #9
Is it possible to seek an extension of proposal submission timeline by a week?

Answer 9: NCTCOG will extend the proposal submission timeline to 2:00 PM CT, February 24, 2023.

Question #10
Does NCTCOG have a tangible project for any of the service categories?

Answer 10: The Pavement Analysis Services program allows TXShare-participating entities to choose from selected vendor/s to contract for pavement analysis services. This service has been provided by NCTCOG for more than five years and has been utilized by multiple member governments. NCTCOG itself will not procure services from the vendor/s.

Question #11
Can we have access to the recording of the Pre-Proposal Meeting from January 27th? It is currently saved on the NCTCOG SharePoint and is inaccessible to members outside of NCTCOG.
Answer 11: The recording can be sent to entities who request a copy of it. It is 400 megabytes in size – so it will have to send using FTP transfer.

Question #12
NCTCOG has provided RFP Attachment A, Pricing Proposal Form. The unit used for said Excel file is either Lane Mile, Linear Foot, Each, etc. These units can be unclear for agencies and vendors. The term lane miles does not correlate to "test miles" because for some functional classes, we would only collect one pass, while on others we would collect two passes. It is easier to come up with the number of test miles when working with the agency and finalizing a contract. In the previous contract, some vendors had a unit of test mile. Can we provide price per test mile rather than lane mile?

Answer 12: Please see the footnote 1. Lane miles are the selected choice of measurement.

Question #13
With regards to collecting assets, it is difficult to calculate cost based on a unit of "each." Most agencies do not know the number of assets (e.g., trees, curb ramp, etc.) at the start of a project. Typically, this is the first time they are doing an asset type inventory and we would not know the number of assets to finalize a contract with an agency. In the previous contract, some vendors had the unit of test mile for assets as well. Can we provide price per test mile rather than per each asset?

Answer 13: Please see revised Attachment A, which modifies some activities to use a unit of "lane miles" instead of "each."

Question #14

In RFP Exhibit B, Service Category #1, Item 5, the RFP states that pavement performance information such as rutting should have a minimum of seven sensors (include pricing for nine sensors as well) fatigue cracking, transverse cracking using a minimum of four sensors, and longitudinal cracking.

Most vendors use LCMS to automatically geo-tag, measure, detect, and quantify all key functional parameters of pavement in a single pass, including (but not limited to): cracking, rutting, texture, potholes, bleeding, shoving, raveling, and roughness. With regards to rutting, we would only use the LCMS system (two sensors to calculate rutting for each wheel track ruts. Similarly, for fatigue cracking, transverse cracking, and longitudinal cracking, we use our LCMS system. Please provide clarification.

Answer 14: If LCMS provides with two sensors output that is equivalent to output of the seven and four sensors described above, please document this in the proposal.

Craigan Johnson
Senior Purchasing Manager

Proposers: Please acknowledge and return a copy of this Addendum with your proposal.

COMPANY NAME: _Roadway Asset Services, LLC_____

SIGNATURE: ___Bart Willis_____

NOTE: Company name and signature must be the same as on the RFP documents.

The Texas Comptroller of Public Accounts (CPA) administers the Statewide Historically Underutilized Business (HUB) Program for the State of Texas, which includes certifying minority, woman, and service disabled veteran-owned businesses as HUBs and facilitates the use of HUBs in state procurement and provides them with information on the state's procurement process.

We are pleased to inform you that your application for certification/re-certification as a HUB has been approved. Your company's profile is listed in the State of Texas HUB Directory and may be viewed online at https://mycpa.cpa.state.tx.us/tpasscmblsearch/index.jsp. Provided that your company continues to meet HUB eligibility requirements, the attached HUB certificate is valid for the time period specified.

You must notify the HUB Program in writing of any changes affecting your company's compliance with the HUB eligibility requirements, including changes in ownership, day-to-day management, control and/or principal place of business. *Note: Any changes made to your company's information may require the HUB Program to re-evaluate your company's eligibility.*

Please visit our website at http://comptroller.texas.gov/procurement/prog/hub/ and reference our publications (i.e. Grow Your Business pamphlet, HUB Brochure and Vendor Guide) providing addition information on state procurement resources that can increase your company's chances of doing business with the state.

Thank you for your participation in the HUB Program! If you have any questions, you may contact a HUB Program representative at 512-463-5872 or toll-free in Texas at 1-888-863-5881.

Texas Historically Underutilized Business (HUB) Certificate

HUB
Statewide Historically Underutilized Business Program

Certificate/VID Number:	**1812684643700**
File/Vendor Number:	**498395**
Approval Date:	**18-MAY-2020**
Scheduled Expiration Date:	**18-MAY-2024**

The Texas Comptroller of Public Accounts (CPA), hereby certifies that

HVJ SOUTH CENTRAL TEXAS - M&J, INC.

has successfully met the established requirements of the State of Texas Historically Underutilized Business (HUB) Program to be recognized as a HUB. This certificate printed 22-MAY-2020, supersedes any registration and certificate previously issued by the HUB Program. If there are any changes regarding the information (i.e., business structure, ownership, day-to-day management, operational control, business location) provided in the submission of the business' application for registration/certification as a HUB, you must immediately (within 30 days of such changes) notify the HUB Program in writing. The CPA reserves the right to conduct a compliance review at any time to confirm HUB eligibility. HUB certification may be suspended or revoked upon findings of ineligibility.

Statewide HUB Program
Statewide Procurement Division

Note: In order for State agencies and institutions of higher education (universities) to be credited for utilizing this business as a HUB, they must award payment under the Certificate/VID Number identified above. Agencies, universities and prime contractors are encouraged to verify the company's HUB certification prior to issuing a notice of award by accessing the Internet (**https://mycpa.cpa.state.tx.us/tpasscmblsearch/index.jsp**) or by contacting the HUB Program at **512-463-5872** or toll-free in Texas at **1-888-863-5881**.

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