

Advertised: **SEPTEMBER 01, 2019****NO ADDENDUM NECESSARY /
NO ADDENDUM ISSUED.****Highway Operations -- Operations Program Management -- Pavement
Management Section****REVIEWED**

By Robert J. Stroup, PE at 8:21 am, Sep 12, 2019

REQUEST for LETTERS of INTEREST (RFLOI)**2019 Quality Assurance for High Speed Data Collection**

TITLE: 2019 Quality Assurance for High Speed Data Collection

USING AGENCY: North Carolina Department of Transportation
Highway Operations -- Operations Program Management -- PMS

ISSUE DATE: **SEPTEMBER 01, 2019**

SUBMITTAL DEADLINE: **12:00PM, SEPTEMBER 27, 2019**

ISSUING AGENCY: North Carolina Department of Transportation
Technical Services Division
Professional Services Management Unit

SYNOPSIS**SUBCONSULTANTS ARE NOT PERMITTED UNDER THIS CONTRACT.**

The primary and/or subconsultant firm(s) (*if Subconsultants are allowed under this RFLOI*) shall be pre-qualified to perform ALL of the work codes listed below for the NCDOT Operations Program Management / PMS. Work Codes required are:

- **405 – Quality Assurance for High Speed Data Collection**

WORK CODES for each primary and/or subconsultant firm(s) (*if Subconsultants are allowed under this RFLOI*) **SHALL** be listed on the respective RS-2 FORMS (see section 'SUBMISSION ORGANIZATION AND INFORMATION REQUIREMENTS').

This RFLOI is to solicit responses (LETTERS of INTEREST, or LOIs) from qualified firms to provide professional consulting services to:

The **CONSULTANT** is to represent the agency in assuring that the High Speed Data Collection and Processing effort meets the requirements of the contract. The **CONSULTANT** should be thoroughly familiar with the RFP/RFOI issued for "2019 High Speed Data Collection and Processing for Pavement Management Section (PMS)" (located here:

[https://connect.ncdot.gov/letting/Private%20Engineering%20Firm%20Advertisement/PVM_2019%20High%20Speed%20Data%20Collection%20and%20Processing%20for%20Pavement%20Management%20Section_Binder1%20--%20FINAL%20\(06.01.2019\)%20\(NO%20ADDENDUM\).pdf](https://connect.ncdot.gov/letting/Private%20Engineering%20Firm%20Advertisement/PVM_2019%20High%20Speed%20Data%20Collection%20and%20Processing%20for%20Pavement%20Management%20Section_Binder1%20--%20FINAL%20(06.01.2019)%20(NO%20ADDENDUM).pdf)),

the NCDOT High Speed Data collection Manual, as well as any additional final requirements and standards that are developed in agreement with the data collection contractor.

Except as provided below any firm wishing to be considered must be properly registered with the Office of the Secretary of State and with the North Carolina Board of Examiners for Engineers and Surveyors. Any firm proposing to use corporate subsidiaries or subcontractors must include a statement that these companies are properly registered with the North Carolina Board of Examiners for Engineers and Surveyors and/or the NC Board for Licensing of Geologists. The Engineers performing the work and in responsible charge of the work must be registered Professional Engineers in the State of North Carolina and must have a good ethical and professional standing. It will be the responsibility of the selected private firm to verify the registration of any corporate subsidiary or subcontractor prior to submitting a Letter of Interest. Firms which are not providing engineering services need not be registered with the North Carolina Board of Examiners for Engineers and Surveyors. Some of the services being solicited may not require a license. It is the responsibility of each firm to adhere to all laws of the State of North Carolina.

The firm must have the financial ability to undertake the work and assume the liability. The selected firm(s) will be required to furnish proof of Professional Liability insurance coverage in the minimum amount of \$1,000,000.00. The firm(s) must have an adequate accounting system to identify costs chargeable to the project.

SCOPE OF WORK

The North Carolina Department of Transportation (NCDOT) is soliciting proposals for the services of a firm/team for the following contract scope of work:

SEE ATTACHMENT: "2019 Quality Assurance for High Speed Data Collection – Scope of Work and Deliverables (FINAL 09.01.2019)" for Scope of Work Details.

PROPOSED CONTRACT TIME: ONE (1) YEAR and FOUR (4) ONE-YEAR EXTENSIONS possible.

PROPOSED CONTRACT PAYMENT TYPE: Cost-Plus payment structure.

SUBMITTAL REQUIREMENTS

All LOIs are limited to **FIFTEEN (15)** pages (RS-2 forms are not included in the page count) inclusive of the cover sheet, and shall be typed on 8-1/2" x 11" sheets, single-spaced, one-sided.

LOIs containing more than FIFTEEN (15) pages will not be considered.

WORK CODES for each primary and/or subconsultant firm(s) (*if Subconsultants are allowed under this RFLOI*) **SHALL** be listed on the respective RS-2 FORMS (see section 'SUBMISSION ORGANIZATION AND INFORMATION REQUIREMENTS').

ONLY ELECTRONIC LOIs WILL BE ACCEPTED.

LOIs should be submitted in .pdf format using software such as Adobe, CutePDF PDF Writer, DocuDesk deskPDF, etc.

One copy of the LOI should be sent as a .pdf file, **through NCDOT's FTS System**, to: psmu-411@ncdot.gov. The FTS system will send you an electronic receipt when your LOI is **uploaded** to NCDOT's FTS system. Paper copies are not required. The subject line should contain the Firm's Name, and **"LOI for 2019 Quality Assurance for High Speed Data Collection"**.

If an interested firm does not have an FTS account they should send a request through regular e-mail to psmu-411@ncdot.gov. A response will be sent via the FTS system that will provide a login username, password, and login procedures.

LOIs SHALL be received electronically no later than 12:00 P.M., SEPTEMBER 27, 2019.

LOIs received after this deadline will not be considered.

Firms submitting LOIs are encouraged to carefully check them for conformance to the requirements stated above (and any other requirements in this Advertisement). If LOIs are submitted late, exceed the maximum number of pages, are sent by any means other than NCDOT's FTS system, or are sent to any address other than psmu-411@ncdot.gov they will be disqualified.

The Department reserves the right to reject all LOIs and not proceed with procurement.

The Department reserves the right to waive any technicality in LOIs, or notify the Firm(s) of such technicality and allow the Firm(s) up to two (2) business days to rectify the technicality.

SELECTION PROCESS

Following is a general description of the selection process:

- The NCDOT Selection Committee will review all qualifying LOI submittals.

- For Limited Services Contracts (On-Call type contracts), the NCDOT Selection Committee MAY, at the Department's discretion, choose any number of firms to provide the services being solicited.
- For Project-Specific Contracts (non On-Call type contracts), the Selection Committee MAY, at the Department's discretion, shortlist a minimum of three (3) firms to be interviewed. IF APPLICABLE, dates of shortlisting and dates for interviews are shown in the section SUBMISSION SCHEDULE AND KEY DATES at the end of this RFLOI.
- In order to be considered for selection, consultants must submit a complete response to this RFLOI prior to the specified deadlines. Failure to submit all information in a timely manner will result in disqualification.

TITLE VI NONDISCRIMINATION NOTIFICATION

The *North Carolina Department of Transportation*, in accordance with the provisions of Title VI of the Civil Rights Act of 1964 (78 Stat. 252, 42 U.S.C. §§ 2000d to 2000d-4) and the Regulations, hereby notifies all RESPONDENTS that it will affirmatively ensure that any contract entered into pursuant to this advertisement, disadvantaged business enterprises will be afforded full and fair opportunity to submit LETTERS of INTEREST (LOIs) in response to this ADVERTISEMENT and will not be discriminated against on the grounds of race, color, or national origin in consideration for an award.

SMALL PROFESSIONAL SERVICE FIRM (SPSF) PARTICIPATION

The Department encourages the use of Small Professional Services Firms (SPSF). Small businesses determined to be eligible for participation in the SPSF program are those meeting size standards defined by Small Business Administration (SBA) regulations, 13 CFR Part 121 in Sector 54 under the North American Industrial Classification System (NAICS). The SPSF program is a race, ethnicity, and gender neutral program designed to increase the availability of contracting opportunities for small businesses on federal, state or locally funded contracts. SPSF participation is not contingent upon the funding source.

The Firm, at the time the Letter of Interest is submitted, shall submit a listing of all known SPSF firms that will participate in the performance of the identified work. The participation shall be submitted on the Department's Subconsultant Form RS-2. RS-2 forms may be accessed on the Department's website at [NCDOT Connect Guidelines & Forms](#).

The SPSF must be qualified with the Department to perform the work for which they are listed.

Real-time information about firms doing business with the Department and firms that are SPSF certified through the Contractual Services Unit is available in the Directory of Transportation Firms. The Directory can be accessed on the Department's website at [Directory of Firms](#) -- Complete listing of certified and prequalified firms.

The listing of an individual firm in the Department's directory shall not be construed as an endorsement of the firm.

PREQUALIFICATION

The Department maintains on file the qualifications and key personnel for each approved discipline, as well as any required samples of work. Each year on the anniversary date of the company, the firm shall renew their prequalified disciplines. If your firm has not renewed its application as required by your anniversary date or if your firm is not currently prequalified, please submit an application to the Department **prior to submittal of your LOI**. An application may be accessed on the Department's website at [Prequalifying Private Consulting Firms](#) -- Learn how to become Prequalified as a Private Consulting Firm with NCDOT. Having this data on file with the Department eliminates the need to resubmit this data with each letter of interest.

Even though specific DBE/MBE/WBE goals are not required for this project, the Department of Transportation is committed to providing opportunity for small and disadvantaged businesses to perform on its contracts through established Department goals. The Firm, subconsultant and subfirm shall not discriminate on the basis of race, religion, color, national origin, age, disability or sex in the performance of this contract.

SELECTION CRITERIA

All prequalified firms who submit responsive letters of interest will be considered.

In selecting a firm/team, the selection committee will take into consideration qualification information including such factors as:

1. **50%** = The firm's understanding of high speed data collection and processing and approach to provide the required services.
2. **50%** = The firm's experience and staff to perform the type of work required.
3. **N/A%** = N/A.
4. **N/A%** = N/A.
5. **N/A%** = N/A.

After reviewing qualifications, if firms are equal on the evaluation review, then those qualified firms with proposed SPSF participation will be given priority consideration.

SUBMISSION ORGANIZATION AND INFORMATION REQUIREMENTS

The LOI should be addressed to **Mr. Robert J. Stroup, PE -- State Professional Services Engineer** and must include the name, address, telephone number, and e-mail address of the prime consultant's contact person for this RFLOI.

The LOI must also include the information outlined below:

Chapter 1 - Introduction

The Introduction should demonstrate the consultant's overall qualifications to fulfill the requirements of the scope of work and should contain the following elements of information:

- Expression of firm's interest in the work;
- Statement of whether firm is on register;
- Date of most recent private engineering firm qualification;
- Statement regarding firm's(') possible conflict of interest for the work; and
- Summation of information contained in the letter of interest.

Chapter 2 - Team Qualifications

This chapter should elaborate on the general information presented in the introduction, to establish the credentials and experience of the consultant to undertake this type of effort. The following must be included:

1. Identify recent, similar projects the firm, acting as the prime contractor, has conducted which demonstrates its ability to conduct and manage the project. Provide a synopsis of each project and include the date completed, and contact person.
2. If subconsultants are involved, provide corresponding information describing their qualifications as requested in bullet number 1 above.

Chapter 3 - Team Experience

This chapter must provide the names, classifications, and location of the firm's North Carolina employees and resources to be assigned to the advertised work; and the professional credentials and experience of the persons assigned to the project, along with any unique qualifications of key personnel. Although standard personnel resumes may be included, identify pertinent team experience to be applied to this project. Specifically, the Department is interested in the experience, expertise, and total quality of the consultant's proposed team. If principals of the firm will not be actively involved in the study/contract/project, do not list them. The submittal shall clearly indicate the Consultant's Project Manager, other key Team Members and his/her qualifications for the proposed work. Also, include the team's organization chart for the Project / Plan. A Capacity Chart / Graph (available work force) should also be included. Any other pertinent information should also be listed in this section.

Note: If a project team or subconsultant encounters personnel changes, or any other changes of significance dealing with the company, NCDOT should be notified immediately.

Chapter 4 - Technical Approach

The consultant shall provide information on its understanding of, and approach to accomplish, this project, including their envisioned scope for the work and any innovative ideas/approaches, and a schedule to achieve the dates outlined in this RFLOI (if any project-specific dates are outlined below).

All QA reports shall be delivered Division-by-Division when completed and the final Division no later than September 30, 2020.

APPENDICES-

CONSULTANT CERTIFICATION Form RS-2

Completed Form RS-2 forms SHALL be submitted with the firm's letter of interest. This section is limited to the number of pages required to provide the requested information.

Submit Form RS-2 forms for the following:

- **Prime Consultant firm**
 - Prime Consultant Form RS-2 Rev 1/14/08; and
- **ANY/ALL Subconsultant firms** (*If Subconsultants are allowed under this RFLOI*) to be, or anticipated to be, utilized by your firm.
 - Subconsultant Form RS-2 Rev 1/15/08.
 - In the event the firm has no subconsultant, it is required that this be indicated on the Subconsultant Form RS-2 by entering the word "None" or the number "ZERO" and signing the form.

Complete and sign each Form RS-2 (instructions are listed on the form).

The required forms are available on the Department's website at:

<https://connect.ncdot.gov/business/consultants/Pages/Guidelines-Forms.aspx>

[Prime Consultant Form RS-2](#)

[Subconsultant Form RS-2](#)

All submissions, correspondence, and questions concerning this RFLOI should be directed to **Mr. Robert J. Stroup, PE** at rjstroup@ncdot.gov. However, the LOI itself must be submitted to 'psmu-411@ncdot.gov' via NCDOT's FTS System.

IF APPLICABLE, questions may be submitted electronically only, to the contact above. Responses will be issued in the form of an addendum available to all interested parties. Interested parties should also send a request, by email only, to the person listed above to be placed on a public correspondence list to ensure future updates regarding the RFP or other project information can be conveyed. Questions must be submitted to the person listed above no later than **5:00pm, SEPTEMBER 10, 2019**. The last addendum will be issued no later than **SEPTEMBER 18, 2019**.

NOTE: To adhere to the Timeframe, a Notice to Proceed is expected to be issued shortly after (a) firm(s)/team(s) is/are selected. All firm(s)/team(s) submitting a LETTER OF INTEREST should make sure that their rates and overheads are current and have been audited by NCDOT.

SUBMISSION SCHEDULE AND KEY DATES

RFLOI Release – **SEPTEMBER 01, 2019.**

Deadline for Questions – **5:00pm, SEPTEMBER 10, 2019.**

Issue Final Addendum – **SEPTEMBER 18, 2019.**

Deadline for LOI Submission – **12:00PM, SEPTEMBER 27, 2019**

Shortlist Announced * - **on or before OCTOBER 11, 2019 (if the Department elects this option).**

Interviews - the week of **OCTOBER 28, 2019 (if the Department elects this option).**

Firm Selection and Notification ** - **TBD.**

Anticipated Notice to Proceed – **TBD.**

* Notification will **ONLY** be sent to shortlisted firms.

** Notification will **ONLY** be sent to selected firms.

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I.A. Description of Work Required

GENERAL

I.A.1. Statement of Needs

I.A.1.a.

The CONSULTANT is to represent the agency in assuring that the High Speed Data Collection and Processing effort meets the requirements of the contract. The CONSULTANT should be thoroughly familiar with the RFP/RFOI issued for "2019 High Speed Data Collection and Processing for Pavement Management Section (PMS)" (located here: [https://connect.ncdot.gov/letting/Private%20Engineering%20Firm%20Advertisement/PVM_2019%20High%20Speed%20Data%20Collection%20and%20Processing%20for%20Pavement%20Management%20Section_Binder1%20--%20FINAL%20\(06.01.2019\)%20\(NO%20ADDENDUM\).pdf](https://connect.ncdot.gov/letting/Private%20Engineering%20Firm%20Advertisement/PVM_2019%20High%20Speed%20Data%20Collection%20and%20Processing%20for%20Pavement%20Management%20Section_Binder1%20--%20FINAL%20(06.01.2019)%20(NO%20ADDENDUM).pdf)), the NCDOT High Speed Data collection Manual, as well as any additional final requirements and standards that are developed in agreement with the data collection contractor.

I.A.1.b.

An annual start up activity should be conducted, reported and approved by NCDOT before production data collection occurs. At a minimum, the startup activity consists of the following:

I.A.1.b.i.

An initial pavement data collection/processing validation, verification and calibration exercise that shall be carried out on no more than 20 roadway sections selected by NCDOT. During this exercise, precision and bias tests will be conducted for all data items.

I.A.1.b.ii.

Calibration procedures, camera angles and coverage, data calculation methods and standard operating procedures used by the data collection contractor will be verified.

I.A.1.b.iii.

All start up work shall be reported to NCDOT at one time in a well-documented, concisely written report. The CONSULTANT shall review and report to NCDOT on the adequacy and acceptability of the results, based on limits provided in the data collection RFP.

I.A.1.c.

The CONSULTANT shall develop a quality assurance sampling plan to assure that all data elements meet contract requirements. These elements include, but are not limited to, images, international Roughness index (IRI), rutting, and cracking. This plan must include sampling methodology for each data element, tests to be performed and acceptance criteria. It is expected that the data collection/automated distress contractor will submit results to NCDOT as each Division is completed.

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The CONSULTANT should consider using Division by Division sampling for monitoring purposes and should also produce an assessment of overall, statewide quality for the final product. The quality assurance plan must be approved by the NCDOT project manager prior to beginning production data review.

I.A.1.d.

The CONSULTANT shall apply their plan on an ongoing basis. If their comparisons to the data collection contractor show consistent errors, they should notify the NCDOT Project Manager immediately so that corrective action can be taken. The goal is to collect high quality data and minimize retesting as much as possible. All incidents of identified retesting or equipment recalibration must be reported through the project manager.

I.A.2. CONSULTANT Reporting Requirements

During the process of data collection and/or processing of pavement condition data, the CONSULTANT shall provide the NCDOT Project Manager the following:

I.A.2.a.

Weekly and monthly reports of all quality assurance checks and any reports of needed retesting or recalibration.

I.A.2.b.

Quality Assurance report on the Start Up process as outlined above. A letter report to the NCDOT Project Manager will suffice.

I.A.2.c.

Quality Assurance plan for Division by Division and statewide tracking.

I.A.2.d.

Division reports on quality assurance within a Division.

I.A.2.e.

Statewide final quality assurance report outlining sampling, Division by Division quality assurance for each data type, and statewide overall quality assurance results. This report should include recommendations, if any, to improve the quality of data in the next round of data collection and processing and any areas where increased quality assurance may be desirable.

I.A.3. Quality Assurance Personnel Requirements

The CONSULTANT shall provide adequate staff to perform the quality assurance checks on an on-going basis. Resumes of key personnel shall be included in the proposal.

I.A.3.a. Quality Assurance Manager

A Quality Assurance Manager shall lead all work on the contract, including development of the Quality Assurance Plan, development of sampling frequencies and methods, review of the start-up process by the data collection contractor, review of the data collection and analysis processes, and verification of the adequacy and accuracy of the collected data. This individual

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must have a strong background in statistics and have a minimum of 5 years of pavement data collection and quality assurance experience.

TASKS

Task 1 - Agency Representation

The CONSULTANT will represent the STATE and its interests in ensuring that only complete and accurate pavement distress data is provided to the PMS and that all vendor delivered data meets the requirements of the High Speed Data Collection and Processing contract.

The CONSULTANT becomes familiar with the services offered by the selected data collection vendor, and through discussion with them understands their data collection proposal.

The CONSULTANT will review the final contract awarded to the selected data collection vendor as well as any additional standards or requirements that the STATE has provided. The CONSULTANT will review the vendor submitted quality control plan and SOPs.

Specific task 1 items include:

1. Project Start-up Meeting in North Carolina
2. Review selected data collection vendor contract, QA procedures and standard operating procedures
3. Review existing distress manuals
4. Participate in the Annual Close-out meeting and provide a year-end report

Task 2 - Development of Quality Assurance Plan

The CONSULTANT will develop a specific Data Quality Management plan for the overall control and delivery of data for this project. The development of a sound data sampling plan will be carried out to assure that the data collected is representative of the section of pavement the sample ultimately represents. The sampling plan will define the extent (such as percent of pavement sections or samples within a section) and frequency for quality checks. The anticipated intervals and benchmarks are provided in the following table.

Data Element	Sampling Interval	Benchmark Criteria
Images	5%	95%
IRI	Weekly	+/- 5% of Average
Rutting	Weekly	+/- 5% of Average
Faulting	Weekly	+/- 5% of Average
Cracking	5%	TBD

The sampling intervals will be based upon random selection techniques applied to each lot of data delivered. If the delivered lots are not division specific, then a stratified sampling will be completed to assure each division is equally represented.

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A final key element of a QA plan is to have established feedback loops for any corrective actions. When the QA process reveals random errors in the data, the data must be reprocessed. However, when systematic errors are identified, large quantities of data, even those previously sampled might need to be reprocessed. Corrective action must be taken on all potentially affected data. In addition, the corrected action must be documented and shared with the entire project team through the STATE's Project Manager with the goals of ensuring reliable data delivery to the STATE, and that the same error is not repeated in subsequent deliverables.

The quality control plan developed will be submitted to and approved by the STATE's Project Manager prior to beginning production data collection and review.

Additional Task 2 items include:

1. Review existing PMS decision trees and evaluate the sensitivity of distress type, severity and quantity.
2. Provide three (3) ratings of all distress control sites as part of the rater pool data.
3. Set-up and receive training on the data collection vendor rating software.
4. Develop and/or update the Data Quality Manual and determine allowable control limits for the distress QA efforts, based upon analysis of the rater pool data.

Task 3 - Annual Startup Activities

The annual start up activities must be conducted, reported, and approved by the STATE prior to production data collection. This activity is critical to assuring the quality of the pavement data collection. Up to 20 roadway sections selected by the STATE will be used for the startup activities. The select data collection vendor will be required to make multiple data collection passes over each calibration section. Bias will be based on the runs made by the data collection vendor vehicles.

The CONSULTANT will observe the entire data collection vendor process ranging from sensor calibrations through data delivery to ensure the SOPs are being followed. Forward and downward images will be checked to confirm proper camera angles and coverage, and data calculation methods verified. This effort will be completed on two (2) data collection vehicles.

Sensor Data

The selected data vendor will need to perform a minimum of five (5) repeat runs on each of the calibration sections with each data collection vehicle. Once this data has validated that the equipment meets the requirements of the RFP, the CONSULTANT will then utilize the multiple run information to determine the precision and bias of the collected data.

By collecting multiple runs on the same site, with the same equipment, at nearly the same time, valuable information is generated regarding the repeatability of the sensor data. When combined with the "ground truth" data (to be provided by the STATE) it will be the basis for determining the statistical precision and bias limits.

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Distress Data

Distress control sites must be established for use in developing control of the rating process. A consensus rating of the control sections will be on workstations using data and imagery provided by the data collection vendor. This should be a combination of the STATE's, the CONSULTANT's and data collection personnel. This will provide the "ground truth" to the actual distresses observable in the field. This will allow determination of variability and provide a means for establishing criteria for future QC/QA reviews based on images. Both distress and rater variability will be evaluated from these control site ratings. A sound methodology for controlling the rating process results from this exercise. Precision and bias statements are developed using this methodology.

Annual Startup Report

The results of the control site reviews, evaluations, and precision and bias statements will be thoroughly documented in one succinct report submitted to the STATE's Project Manager. The report will provide all data collected, processed, and analyzed and will include a recommendation on the suitability of the equipment, personnel, and processes to begin production level data collection. This document will include the determined precision and bias statements for both within truck and between truck variation analysis for IRI, rutting, faulting and cracking measurements.

Specific task 3 items include:

1. Provide suggestions and recommendations to the STATE on the number and type of control sites for each data element.
2. At the STATE's discretion, provide on-site personnel during the data collection startup process for two (2) vehicles, includes observing equipment calibration and data collection efforts.
3. Determine precision and bias statements for IRI, rutting faulting and cracking measurements from the control site data analysis.
4. Develop and submit a comprehensive startup report, prior to any production level data collection.

Task 4 - On-going Independent Quality Assurance of Reported Data

As each batch of pavement data is delivered by the selected data collection vendor, the CONSULTANT will provide the incremental data QA review. Initially, the CONSULTANT anticipates this review being completed on 5% of the delivered data. Data will be sampled randomly from each lot of data delivered, with each of the 14 divisions sampled equally.

The quality of collected IRI, rutting, and faulting data will be evaluated weekly via control site checks. The CONSULTANT will request and review this data at random times to ensure that the process is being completed, and confirm that the equipment continues to perform as designed.

The CONSULTANT's staff will provide independent, external quality assurance of the pavement distress data. This QA review will be performed to ensure an adequate level of data accuracy is being achieved. Checks will be made of the STATE's distress values, to ensure the results provided are consistent, reliable, and useable. The plan for performing quality assurance testing on the delivered pavement distress data will be carried out by trained pavement distress raters completing distress take-offs from

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the digital images for the sampled sections. This method allows for rapid QA checks in a safe and efficient manner. The QA rating will be conducted using manual interpretation methods by two (2) independent raters for each homogenous section. Two 50% sample ratings will be collected, and the index results averaged for use in comparison with the vendor results. This independent sample approach adds further validity to the process.

Weekly and monthly reports of all quality assurance checks, including the need to recalibrate or retest will be provided to the STATE's Project Manager. Ongoing quality assurance results will also be provided in both division and statewide summary formats. A final QA report outlining sampling, division-by-division QA results for each data type, as well as statewide results will be provided, along with suggested improvements for future data collection to the STATE's Project Manager.

Specific task 4 items include:

1. Review 100% of the delivered data for completeness and reasonableness.
2. Review 5% of the delivered distress data for conformance with the DQM.
3. Review weekly/monthly sensor calibration results.
4. Provide weekly status reports to the STATE's Project Manager.
5. Provide monthly status reports to the STATE's Project Manager.
6. Provide QA feedback reports by division or more frequently if needed.
7. Provide division by division summary QA reports.
8. Provide statewide summary QA report.