SOUTH JERSEY TRANSPORTATION PLANNING ORGANIZATION

ITEM 1807-16: Approving the Selection of Advanced Infrastructure Design, Inc. as the Consultant for the Regional Pavement Condition Data Collection Study

PROPOSAL

At its July 9, 2018 meeting, the SJTPO Technical Advisory Committee recommended that the Policy Board approve the selection of Advanced Infrastructure Design, Inc. (DBE), with subconsultant AECOM, for the Regional Pavement Condition Data Collection technical study.

BACKGROUND

The Request for Proposal (RFP) for the technical study was issued on May 16, 2018. With the request, SJTPO was seeking qualified firm(s) to is to collect, process, and map pavement condition data on approximately 1,491 miles of county roadway in the SJTPO Region. The Notice of Availability of Requests was sent to 214 contacts.

A total of four (4) proposals were received on June 13, 2018. Proposals were reviewed and scored by the TAC-designated Consultant Selection Committee with representatives from SJTPO, NJDOT, Atlantic County, Cumberland County, Cape May County, SJTA, and City of Vineland. Proposals were evaluated cost-blind, based on the technical approach, firm and staff qualifications, and DBE participation. Scores for each reviewer were converted to a rank, which was then averaged amongst all reviewers with **Advanced Infrastructure Design, Inc.** emerging as the top-ranked firm. Advanced Infrastructure Design, Inc. is a DBE firm, and is partnering with subconsultant AECOM. The proposed cost is **$171,366.39**, with 84.9% DBE participation. The contract end date will be June 30, 2019.

If this contract is awarded, the SJTPO DBE/ESBE participation rate for FY 2019 would be 84.9% as this is the first technical study in FY 2019. The attached resolution authorizes the Executive Director to negotiate minor revisions to the scope of work and fee to best advance the goals and intent of the project.

This study is to be funded through Task 19/401 Regional Pavement Condition Data Collection in SJTPO's UPWP for FY 2019 with $173,957 in available budget.

June 13, 2018

Advanced Infrastructure Design, Inc.

Andrew Tracy, Program Engineer
South Jersey Transportation Planning Organization
782 South Brewster Road, Unit B6
Vineland, NJ 08361

Re: Proposal – Regional Pavement Condition Data Collection Project- 1,491 miles of County Roadways

Dear Mr. Tracy:

Advanced Infrastructure Design, Inc. (AID) is pleased to submit our proposal in response to the subject SJTPO solicitation. As a small business in central New Jersey with pavement testing and engineering as its core services, you can be assured there will be no learning curve if we are selected for this project. Having completed many similar projects, including work for Union, Middlesex and Burlington Counties, the Atlantic City Expressway and NJ Turnpike Authority, we are poised to hit the pavement running and **deliver on-time pavement condition data *and treatments*** for the four SJTPO counties to put them on the fast track to making informed programming decisions and advancing pavement preservation on their roads.

AID will lead approximately 85% of the work on this project as a certified NJ DBE/ESBE. Our Project Manager for this proposal is **Dr. Manuel Celaya, Ph.D., P.E.**, who heads AID's Nondestructive Testing (NDT) division and is at the forefront of applying cutting edge technology to evaluate infrastructure, including roadway pavements, bridges (decks and substructures), and tunnels. Manuel has managed pavement data collection, analysis, and management assignments at the network and project levels on more than 10,000 roadway miles. Assisting Dr. Celaya will be AID's **Mr. Michael Frabizzio, M.S.C.E., P.E.,** a well-known and well-respected pavement engineer with almost 20 years of pavement evaluation and design experience. Michael has provided pavement data QA/QC and pavement treatment support on AID's various pavement management system projects and overseen about 500 NJDOT and NJ county pavement engineering projects.

Continuing a rich teaming history, AID welcomes AECOM to the AID Team as its subconsultant for GIS support. As an experienced GIS Analyst and Cartographer, **Mr. Christopher Salvatico, GISP** of AECOM will lead the AID Team's GIS work. **Mr. Samuel Donelson, P.E.**, former Executive Director and Chief Engineer of the South Jersey Transportation Authority and current AECOM VP, will also be actively involved on the AID Team. Sam's valuable experience with SJTA and SJTPO will be leveraged to ensure seamless project coordination, administration, and management.

By this letter, AID acknowledges review and acceptance of the SJTPO Standard Contract Agreement.

We have the state of the art equipment, staff expertise with similar experience, and a sound understanding of what the SJTPO and its constituent counties need under this project. We look forward to the opportunity to deliver this project to you and exceed your expectations. Please feel free to contact me at (609)-838-2216, ext. 205) should you have any questions or need any additional information.

Sincerely,

Kaz Tabrizi, Ph.D., P.E.
Executive Vice President

Project Understanding

The South Jersey Transportation Planning Organization (SJTPO) has posted an RFP for a "Regional Pavement Condition Data Collection Project." As clearly stated in the RFP, the purpose of this project is to collect pavement condition data to enable its constituent counties to make informed programming decisions and advance pavement preservation techniques. Accordingly, Advanced Infrastructure Design, Inc. (AID) has developed this proposal to provide a value-focused deliverables package that aims to hand the counties the data they need and put them on the fast track to optimizing their networks through pavement preservation.

To this end, the AID Team will collect pavement condition data that ***meets the FHWA's Highway Performance Monitoring System (HPMS)***. The following proposed activities will satisfy all of the requirements in the RFP and supplement those with value-focused additions to readily **provide the Counties with treatment recommendations for implementation of FHWA's Every Day Counts "Pavement Preservation" initiative:**

- **Collection of Automated Pavement Condition Data:** Collect comprehensive, automated pavement data with AID's Integrated Testing Vehicle (ITV) that includes IRI measurement, 3D distress mapping, video imagery, and Ground Penetrating Radar (GPR) data. This data will be collected on approximately 1,491 centerline miles of roadways in the SJTPO region across Atlantic, Cape May, Cumberland, and Salem Counties.
- **HPMS Condition Data Processing:** Process network-level pavement condition data that includes International Roughness Index (IRI) data as well as key supplemental data – cracking percent, rutting, faulting, and Present Serviceability Rating (PSR). These data parameters are the only pavement condition data specified in FHWA's HPMS, which sets the national standard for network-level pavement performance monitoring and thus serves as the basis for New Jersey DOT's Pavement Management System (PMS) data collection. GPR data will also be collected and available for processing if pavement thickness data is desired.
- **Identification of Pavement Preservation Candidates for Entire Network:** Identify appropriate pavement treatment types based on the collected pavement condition data in a simple and transparent spreadsheet format. Here, pavement sections will be flagged as candidates for either specific pavement preservation treatments (e.g., micro-surfacing, micro-milling, thin overlay, and crack sealing) or more intensive rehabilitation (e.g., resurfacing).
- **GIS Mapping:** Map the pavement condition data and corresponding pavement treatments in an ESRI ArcGIS 10 format to enable user-friendly viewing and visualization by all stakeholders.

As a regional leader in pavement engineering, AID is intimately aware of the capabilities of automated pavement condition assessment technology. We have thus formulated the above activities to take advantage of data that can be ***efficiently***, ***safely***, and ***reliably*** collected and processed. Assignment of additional distress types and indices beyond the above parameters introduces a source of potential inconsistency and requires additional labor and time, as it is done through semi-automated methods (human raters reviewing automated images). The savings realized by our approach will be leveraged to deliver pavement treatment identification that will put the counties on the fast track to optimizing their pavement programming decisions.

Approach

The AID Team will combine AID's Integrated Testing Vehicle, which is an all-encompassing automated pavement condition and thickness data collection van, with an experienced group of pavement engineers and GIS specialists to not only collect and report pavement condition data but also take the next step by offering pavement treatment suggestions for the SJTPO counties. This high-value approach will provide objective, defensible performance data, satisfy HPMS requirements, and put the counties on the fast track towards network optimization via pavement preservation techniques.

We first will introduce our team and the technology to be employed, then we will detail our approach and deliverables by task, as outlined in the RFP.

<u>The AID Team</u>

The go-to expert in pavement engineering for NJDOT over the past two decades, AID is a consulting engineering firm located in central New Jersey that specializes in pavement testing, evaluation, design, and management. Acting as the Prime/Lead Consultant for the AID Team, AID looks forward to this opportunity to serve SJTPO and its constituent counties through this project. The objective is to provide a low-cost automated pavement data collection method as a way to provide SJTPO sub-regions with the data needed to make informed programming decisions. A New Jersey certified DBE/ESBE firm, AID will commit the required resources, including staff and equipment, to deliver the pertinent data for this project on time, within budget, and to the highest quality standards.

We have assembled a team with expertise and vast experience in delivering the scope of work outlined above and responsive to the purpose and intent of the work conveyed in the RFP. All equipment needed for this project, including AID's ITV, is stored at AID's office in Hamilton, NJ, where the bulk of all data processing and analysis will take place as well. AID's Dr. Manuel Celaya, P.E. will serve as our Project Manager. Dr. Celaya has completed network-level, automated pavement condition data collection on more than 10,000 roadway miles as AID's

PM, including similar projects for Union, Middlesex, and Burlington Counties as well as the Atlantic City Expressway and the entirety of the NJ Turnpike and Garden State Parkway. A talented team of pavement engineers and technicians is available to support Dr. Celaya. Among this support team is Mr. Michael Frabizzio, M.S.C.E., P.E., who has served as AID's Project Manager in leading NJDOT's Pavement Engineering term agreements over the past 12+ years. In fact, AID assisted NJDOT with developing its IRI ride quality specifications and subsequent updates over the years.

AID welcomes AECOM to its team as a Sub-consultant to provide support regarding GIS activities and project coordination. AID and AECOM share a rich history of partnering on NJ-based pavement projects. Mr. Samuel Donelson, P.E. will lead the work on behalf of AECOM out of its Piscataway, NJ office. As the former Executive Director and Chief Engineer of the South Jersey Transportation Authority (SJTA), Mr. Donelson is intimately familiar with SJTA and SJTPO protocols, and as such, will advise the AID Team to facilitate project coordination and administration. AECOM has a long record of planning projects in South Jersey, including many projects for SJTPO. These projects include updating the Regional Transportation Plan (RTP) and working on the travel demand model.

Leading Technology

Beyond its experienced team of pavement engineers and GIS specialists, the AID Team brings a unique asset to the table for this project – dedicated equipment, locally housed and ready for use at a moment's notice. The AID Team proposes to collect all pavement condition data simultaneously at posted roadway speeds without interruption to traffic using AID's ITV. Data to be collected with this vehicle includes: high-resolution video images; continuous IRI, rut depth, faulting, and cracking using a Laser Crack Measurement System (LCMS); and, continuous GPR data that can be used to estimate pavement thickness. The GPR raw data will be collected at no additional cost. Should SJTPO be interested in the analysis of this raw data for pavement thickness, either in full or for select pavement sections, a separate cost estimate can be provided. All this information will be recorded with GPS coordinates (latitude and longitude) having sub-centimeter accuracy to allow for easy integration with the counties' geodatabases. AID's ITV is equipped with an Applanix POS LV 420 unit to enhance its GPS capabilities. This is one of the most reliable and advanced precision locating sensing systems that will enable our data collection to be performed reliably and accurately in the most difficult GNSS/GPS conditions to produce sub-centimeter accuracy.

AID Integrated Testing Vehicle (ITV) Equipped with LCMS, HD Cameras, GPS & Applanix System, GPR Antennas and DMI

The proposed scope of work includes collection of IRI in conformance with the RFP. The AID Team also proposes to collect Cracking Percent, rut depth, faulting, and PSR as complementary data to IRI, as this distress data combined with the ride quality data will help provide a complete picture of the existing pavement condition. While it is intuitively expected that poor distress condition (e.g., cracking) will manifest in a poor IRI, experience has taught us that this is not necessarily true. In fact, pavements with extensive cracking may have an acceptable IRI, and vice versa, pavements with poor IRI may not exhibit much cracking. IRI is thus only one piece of the puzzle. Hence, considering only IRI may lead to inappropriate decisions on pavement treatment selection, resulting in wasted expenditures and premature pavement failures. For this reason, NJDOT considers both IRI and a distress index (Surface Distress Index, SDI, similar to PSR) in rating its pavements under its Pavement Management System. Cracking percent, rut depth, and faulting, all collected at posted speeds, will be processed along with PSR using automated algorithms, affording a cost-effective, time-efficient means of completing the pavement condition puzzle, marrying ride quality (IRI) with the distress data. The resulting data

provides a framework for making informed programming decisions that consider both the functional and structural needs of the pavement.

Our approach will fully satisfy SJTPO's data gathering requirements with regard to FHWA's HPMS reporting and actually help SJTPO in optimizing the condition of its pavement network. Our efforts will enable the SJTPO counties to develop optimized roadway improvement programs that consider the needs of the pavement network and current or anticipated funding levels. Optimization involves maximizing the long-term performance of the pavement network within the forecasted budget by selecting a mix of fixes for a prioritized listing of project segments. As an added value, the AID Team will identify appropriate pavement treatment types for each data reporting interval (every tenth mile) based on the collected pavement condition data.

The pavement condition database will be delivered in a GIS format that will contain the collected data mapped to the pavement segments. The GIS deliverable will be compatible with ESRI ArcGIS 10. The resulting database will be developed in such a manner to allow easy access and use by SJTPO/County staff, officials, and freeholders. Quality assurance/quality control (QA/QC) will be incorporated into all facets of the project from data planning to collection to analysis and compilation through data delivery.

Task 1: Project Coordination

The AID Team will initiate the project by coordinating a kick-off meeting and follow-up meetings as necessary to gather the project requirements and ensure that all stakeholder concerns and interests are fully understood. These meetings will bring together representatives from the SJTPO, counties, and the AID Team and be held at either the SJTPO office in Vineland, NJ or at Vineland City Hall. It is also envisioned that lessons learned by both the SJTPO/Counties and the consultant team will be shared. All of these efforts will help to ensure successful execution of the project and satisfaction of the SJTPO/Counties with the deliverables. The AID Team will use this information to fine-tune its plan for collection, processing, QA/QC, and delivery of the desired pavement condition data. Once developed, the draft processes and deliverables format will be presented to the stakeholders at a draft deliverables format meeting for acceptance before initiating full-scale data collection on the project.

AID's Project Manager will submit a project status update to SJTPO's Project Manager every two weeks via email. These updates will describe work completed during the expiring interval, upcoming tasks for the next four weeks, any delays or other occurrences that could potentially affect the schedule, and any assistance that is anticipated to be needed from stakeholders in the coming weeks. In addition, AID's PM will keep SJTPO's PM updated on any pertinent project information and schedule meetings when appropriate. Upon completion of all data processing,

a draft deliverables meeting will be held to guide the SJTPO and Counties through the deliverables. A subsequent, final meeting will be conducted to present the final deliverables. The AID Team will prepare agenda for all meetings and prompt minutes summarizing the discussions and actionable items that took place during meetings. In addition, all project correspondence will be documented and available for submission to the SJTPO/Counties, including emails and written summaries of key decisions made during phone conversations.

AID will follow its project management protocols in the execution of this project. Such protocols include: monitoring of the scope, schedule, and costs on the project; quality assurance and quality control checks throughout the life-cycle of the project per AID's Quality Management Plan; documentation of all communications; assessment and control of risks to the project; and management of all other aspects of the project (e.g., contracts, project documents, etc.).

Leveraging his valuable experience with SJTA and past work with SJTPO, Sam Donelson will serve as an additional source of advice for AID's PM to ensure seamless project coordination, administration, and management.

Task 1 Deliverables:

- Agenda and minutes for: project kick-off meeting, presentation of draft deliverables format, project progress meetings, and presentation of draft deliverables
- Project status updates every 2 weeks and as otherwise necessary
- Monthly invoices
- Other project documents (on file available for submission)

<u>Task 2: Pavement Condition Data Collection</u>

This task constitutes the bulk of the work on this project, where the pavement condition data will be collected and the primary deliverables will be developed. As noted previously, the AID Team proposes to collect the following data items on the approximately 1,491 centerline miles of county roads in the SJTPO region:

- IRI
- Cracking Percent (both within wheel paths and within entire lane width)
- Rutting
- Faulting (for rigid/concrete pavements)
- PSR
- Video images
- LCMS images

While only IRI is required under the RFP, collection of the above data has been carefully considered, as these parameters 1) can be ***efficiently***, ***safely***, and ***reliably*** measured by automated means, and 2) provide a comprehensive picture of pavement condition for network-level programming of pavement treatments. We have divided this task into three sub-tasks – Project Setup, Data Collection, and Data Processing and Reporting, each of which is discussed below.

Project Setup

Under the project setup sub-task, the following one-time work efforts will be undertaken prior to data collection:

1. Obtain LRS (Linear Referencing System) from the SJTPO/Counties.

The project team will meet with SJTPO and County staff to discuss and acquire information regarding the roadways to be inventoried for this project. The team will also review any other available information pertaining to the data collection. The existing Linear Referencing System (LRS) – i.e., mileposts per Straight Line Diagrams – will be reviewed to identify the components of the system.

2. Obtain County maps and geodatabase files with the roadway network and determine segment beginning and end points.

Similar to the LRS, geodatabase files will be compiled to identify the limits of all County roads that will be inspected. The shapefiles provided through the RFP website will be reviewed to ensure files for all roads are available. In addition, all associated information within the geodatabase will be reviewed in detail and the AID Team will discuss with the Counties to ensure a full understanding of the design, and if applicable, connecting attributes between systems. It is our understanding that milepost and geocoded information for most County roads is available via Straight Line Diagrams. Such information will be used to define control points and establish the baseline for each road.

In addition, beginning and end points of all County roads to be inspected will be determined in close coordination with the SJTPO/County staff. The County road LRS, Google Earth georeferenced imagery, available basemaps from the U.S. Geological Survey, NJDOT Straight Line Diagrams, and other sources will also be used as references. Attributes that link to the County's current GIS application will be provided.

3. Create data tables for each travel lane, divided into existing segments.

The team will then outline how the pavement database will be designed. The process of how the data will be organized will also be outlined. The geodatabase model will be set up with standard domains, tracking pavement attributes that will describe the condition of pavement (i.e., IRI, cracking percent, rutting, etc.) and positional information. In this regard, a spreadsheet template will be developed and its format will be provided to SJTPO/County staff for approval prior to data collection efforts. Tentatively, one master spreadsheet that includes the County roadway network divided by segments will be provided for each of the four counties.

4. Develop data fields to be populated with fixed and variable pavement information.

The information obtained during the field data collection, including IRI, cracking percent, rutting, faulting, and PSR, will be integrated into the master summary spreadsheets. As previously noted, GPR data will also be collected simultaneously with the noted data. Such data will be available (at additional cost) for processing to obtain the pavement thickness either for sections or the entirety of the County networks at the discretion of the SJTPO/Counties. Fixed data to be compiled will include pertinent inventory data such as route and direction identifiers, NHS status, age since last rehabilitation, and traffic volume. Video and LCMS images will also be compiled and made available through a separate database with summary spreadsheets. In these spreadsheets, image links, GPS coordinates, date and time of data collection, and vehicle speed will be provided for every recorded image.

5. Develop plan for data collection routes and schedule and consult with the SJPTO/Counties for suggestions regarding obstacles to data collection on heavily trafficked routes.

The team will generate route mapping from the data received from the Counties and SJTPO. The route mapping will act as the visual management component to depict the mission planning of field data collection. A test plan will be developed by the project team in close coordination with the SJTPO/County staff. The objective of this task will be to identify the order of preference and schedule of the County roads to be inspected. If heavy traffic, construction, or other impediments for data collection are anticipated for specific roads, these issues will be discussed and resolved between the project team and the SJTPO/County staff. Nevertheless, AID will dedicate its resources, including staff and equipment, to ensure timely collection of the field data and minimize mobilization/demobilization costs. In addition, weather conditions will be monitored during the scheduling process to ensure that data is collected when the roadways are free of rain or snow.

6. Establish data collection and formatting protocols.

Data will be collected and delivered to the SJTPO/Counties in an agreed upon electronic format. Specifically, the following data will be collected and reported for each roadway segment: IRI per ASTM E 950-09 and E 1926-08 and AASHTO M 328-10-UL and R 057-10-UL with reporting of left and right wheel paths and the average of both wheel paths; rut depth with reporting of left and right wheel paths, the average of both wheel paths, and the maximum value within every roadway segment; faulting with reporting of the average absolute faulting of the right wheel path; cracking percent with reporting of the percentage of cracking within wheel paths only (HPMS requirement) and for the entire tested lane width; and, PSR for the tested lane. The average asphalt pavement thickness of the lane can also be computed per ASTM D 4748 at additional cost at the discretion of the SJTPO/Counties. GPS coordinates to sub-centimeter accuracy, including latitude and longitude, will be reported along with locations per each County's LRS. Moreover, roadway video images will be recorded at regular intervals (typically 20 ft.). In addition, 3D surface images with the LCMS system will be obtained. Video and LCMS images will be stitched together to provide a more comprehensive view of the pavement investigated.

Regarding reliability of IRI measurements, as a rule of thumb, 15.5 mph (25 km/hr.) should be viewed as a lower limit for obtaining profiles for "typical" analyses such as IRI (*The Little Book of Profiling*, Sayers, M., W. and Karamihas, S., M., 1998). For roadway segments where measured IRI is not reliable (low speed, road impediments, others), a note will be made on the summary master spreadsheet. It should be noted that FHWA's final rules for establishing performance measures for Metropolitan Planning Organizations (MPO's) added the use of PSR to determine pavement condition where posted speed limit is less than 40 mph. Because the AID Team will be providing both IRI and PSR for all sections, both data parameters will be readily available.

7. Establish Quality Management Plan for project.

AID recognizes the importance of QA/QC at every step of a successful project. A Quality Management Plan will be prepared and submitted to the SJTPO/Counties at the outset of the project. This plan will be distributed and reviewed with all members of the AID Team to ensure an understanding of the required procedures to be followed in ensuring quality. QA/QC will occur at each stage of the project – field data collection, processing of field data, analysis of field data, data compilation, and reporting. QA/QC will include following standards and

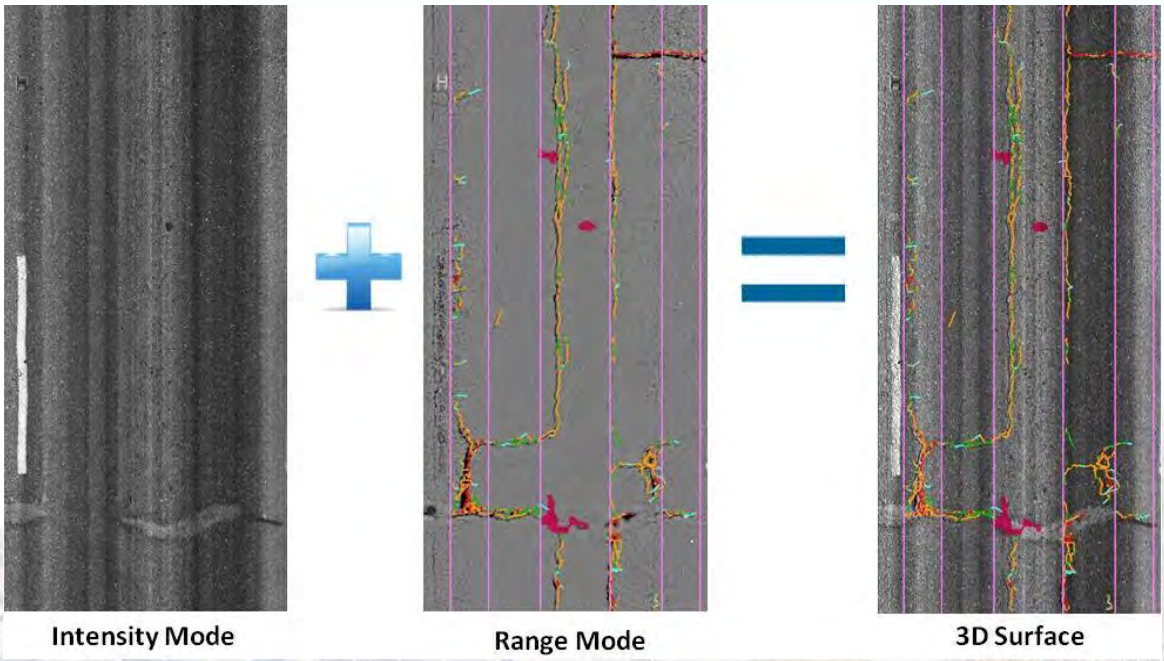
operations to control quality as well as carrying out random inspections and other techniques to assure quality.

Data Collection

The AID Team will carry out the data collection for this project using its all-in-one Integrated Testing Vehicle (ITV). The ITV vehicle integrates linear distance measurement and GPS, a wide-angle high-resolution video camera, a Laser Crack Measurement System (LCMS), and Ground Penetrating Radar (GPR) antennas. The AID Team intends on utilizing this vehicle to collect the data listed at the beginning of the Task 2 discussion. Because GPR data can be collected simultaneously with no additional effort, we will also collect this data at no additional cost and store the raw data for future use by the SJPTO/Counties, if desired.

AID's LCMS system scans the pavement surface using transverse profiles collected at 5 mm intervals. Every individual transverse profile is composed of 4,160 data points. The surface profile can be analyzed to generate the longitudinal profiles for measuring roughness (IRI) and faulting and transverse profiles for assessing rut depth. Additionally, the LCMS system allows collecting surface distress data (Cracking Percentage) via automated crack detection algorithms.

AID's LCMS unit meets and exceeds ASTM E 950 Class I profiler requirements and has been tested and verified by the Maryland State Highway Administration (MDSHA). The LCMS enables collecting IRI data within a speed range of 15-60 mph. AID will follow ASTM standards in collecting IRI data for this project. Moreover, the LCMS' 3D imaging system is recognized under Code 1 for IRI equipment type by FHWA's *HPMS Field Manual (Dec. 2016)*. Typical visual output from the LCMS system, showing the Intensity, Range, and Combined 3D Surface laser images (with distresses superimposed), is shown below for illustrative purposes.



LCMS Processed Image Sample

Thanks to extensive experience, including thousands of miles of road condition inventorying, AID has perfected its ITV data collection protocols. Such data collection will be performed by two people – a driver of the testing vehicle and an experienced engineer who will monitor and control the data collection. The engineer will monitor the roadway videolog data collection in-progress to ensure proper settings to optimize video quality accounting for sun angles and tree cover. No Maintenance and Protection of Traffic (MPT) is required for the data collection efforts.

Video will be collected with a high-resolution camera affixed to the roof of the ITV. The video camera is retrofitted with a wide-angle lens to provide near panoramic viewing (~120° field view) of the roadway pavement. AID has developed a state-of-the-art post-processing system that allows imprints on the collected video. Location information (roadway or street ID, direction, lane, linear referencing system, and GPS coordinates), date, logos, and images are a few examples of data that can easily be imprinted on the video (see sample below). The camera system in use includes a Lumenera LT425C camera with USB 3.0, Gigabit (GigE) and Ethernet capabilities, which provides 4.2 Megapixel images and allow for an efficient interface with the host computer. The HD image quality of the Lumenera camera ensures precise measurement and detection of small features and also allows better location accuracy and faster scanning of larger objects. This camera is versatile in its adaptability with various lens types. For this project video will be collected in the field then post-processed in the office to show the roadway

information on-screen. Tentatively, roadway video images will be recorded at 20 ft. intervals, although this can be adjusted to suit the SJTPO/Counties' needs. In addition, AID has developed an all-in-one viewing deliverable, whereby right-of-way roadway images are viewed with their corresponding LCMS images. Accordingly, 3D surface images obtained with the LCMS system will be stitched together to provide a more comprehensive view of the pavement investigated. A typical example of a screen shot from two raw images (video and LCMS) is shown below.

Integration of Single Camera Image (Wide-Angle Lens) and LCMS Data

The total mileage of the network to be collected is 1,491 centerline miles, approximately divided among the four constituent counties as follows:

- 373 miles in Atlantic County
- 213 miles in Cape May County
- 542 miles in Cumberland County
- 363 miles in Salem County

It should be noted that data will be collected within County roads as follows:

- On two-lane roadways, data will be collected in one travel direction with AID's ITV on

each roadway segment

- On multi-lane roadways, data will be collected within the most heavily used lane (i.e., generally the right lane) in each travel direction
- Unpaved/dirt roads will not be investigated

The AID Team stands ready to begin work on this project immediately upon Notice to Proceed, anticipated to be in early August 2018 per the RFP. Upon NTP we will initiate project coordination and concurrently begin appropriate project setup work. Allowing 4 weeks for coordination and setup tasks, it is anticipated that field data collection can begin at approximately Week 5 from NTP. We anticipate a duration of up to 10 weeks for data collection, allowing time for weather and other potential unforeseen circumstances, resulting in completion of such data collection within 14 weeks from NTP. AID's engineers and technicians are highly trained in the use of our testing equipment and well-versed with the maintenance requirements of the various devices and technologies utilized. This expertise, coupled with their experience on data collection projects, enables our staff to troubleshoot equipment malfunctions, mitigating risks to the schedule. At the project outset, the AID Team will contact each county to request notice of roadway construction or other events that may impact data collection. Such information will be considered in developing the data collection plan for each county. Prior to beginning field data collection, the AID Team will then contact each county again to provide advance notice, obtain updates on conditions that may affect data collection, and receive approval to proceed.

Data Processing and Reporting

Data from the field will be processed in the office to provide pavement condition parameters for every roadway segment, where locations will be referenced to both the Counties' LRS and GPS coordinates. This involves: processing of LCMS data using the system's software and processing of LCMS and video images using AID's proprietary programs. The results yielded by LCMS data processing include IRI, cracking percent (within wheel paths only and within entire lane width), rutting, and faulting (for rigid/concrete pavements) for every tenth mile of each road segment. The PSR will be likewise computed for each tenth mile by relating these four parameters to the PSR's 0-5 scale per the verbal descriptions in the *HPMS Field Manual (Dec. 2016)*. The image processing will yield stitched images showing ROW roadway view and LCMS distress mapping side-by-side every 20 ft.

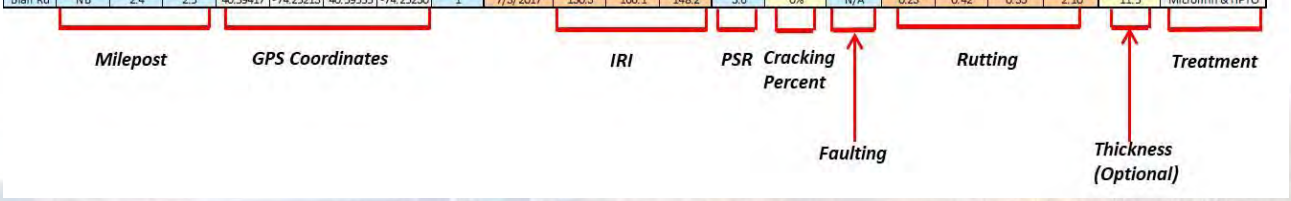
Taking advantage of the capabilities (but not extending beyond them, which would require intervention by human raters) of the currently available technology, all of the above data and images will thus be processed using fully automated methods. This translates into time savings, which will be leveraged to deliver pavement treatment identification. Decision treatment logic

will be formulated with input from the SJPTO/Counties to identify treatment types to be considered (with a focus on pavement preservation techniques, such as micro-surfacing, micro-milling, thin overlay, and crack sealing) and relate the pavement condition and other pertinent data to treatment selection. For example, a pavement section with a PSR above 3.5, age greater than 5 years, and IRI less than 285 in./mi. may be assigned for micro-surfacing to seal surface distresses, prevent moisture intrusion, fill shallow ruts, and provide a new riding surface. If the same conditions exist but the IRI was greater than 285 in./mi., micro-milling and application of a thin overlay could be assigned to enhance the ride quality in addition to the previously mentioned improvements. The AID Team thus proposes to develop and apply decision treatment logic to the tenth mile sections of each road segment to identify pavement treatment types, thus putting the counties on the fast track to optimizing their pavement programming decisions. This treatment logic will consider the attributes and relative costs of the treatment alternatives. Based on its experience on other NJ county projects, the AID Team has compiled the following typical unit costs per square yard: crack sealing ($2.60), micro-surfacing/slurry seal ($4.10), micro-milling plus thin overlay ($11.90), mill 2”/pave 2” ($13.90), and mill 4”/pave 4” ($23.40).

The pavement condition, treatment, and inventory data will be provided in MS Excel format for every tenth mile of each road segment and allow for easy syncing back into the Counties’ geodatabases (see sample below). In addition, stitched LCMS and video image files and links via MS Excel will be provided every 20 ft., similar to that shown below.

For QA of the cracking percentage the AID Team will simultaneously review video and LCMS cracking images at a sampling rate of approximately 5% of the images on a random basis within each tenth mile of road. AID will use the Excel files and the accompanying images to verify the accuracy of all automated condition parameters at a sampling rate of approximately 5%. AID’s Quality Management Plan will detail action plans for correcting all errors, both random and systematic.

Rte	Dir	MPFrom	MPTo	GPSFrom		GPSTo		LaneDes	ProfilerDate	LIRI	RIRI	AIRI	PSR	Crack %	Faulting	LRut	RRut	ARut	MRut	ACThick	Treatment Type
Blair Rd	NB	0.7	0.8	40.57042	-74.25901	40.57180	-74.25849	1	7/3/2017	618.6	730.3	674.4	3.1	0%	N/A	0.58	0.24	0.41	1.66	11.0	Microsurface
Blair Rd	NB	0.8	0.9	40.57180	-74.25849	40.57318	-74.25789	1	7/3/2017	711.8	608.2	660.0	0.8	0%	N/A	0.37	0.47	0.42	2.13	11.0	Microsurface
Blair Rd	NB	0.9	1.0	40.57318	-74.25789	40.57456	-74.25728	1	7/3/2017	466.2	371.3	418.7	3.3	0%	N/A	0.30	0.13	0.22	1.80	11.0	Microsurface
Blair Rd	NB	1.0	1.1	40.57456	-74.25728	40.57592	-74.25664	1	7/3/2017	531.8	449.3	490.6	2.1	0%	N/A	0.22	0.12	0.17	1.38	11.0	Microsurface
Blair Rd	NB	1.1	1.2	40.57592	-74.25664	40.57729	-74.25599	1	7/3/2017	538.2	506.8	522.5	2.2	60%	N/A	0.31	0.13	0.22	1.00	11.0	Microsurface
Blair Rd	NB	1.2	1.3	40.57729	-74.25599	40.57865	-74.25536	1	7/3/2017	500.8	433.5	467.2	2.3	0%	N/A	0.39	0.12	0.26	2.09	11.0	Crack seal
Blair Rd	NB	1.3	1.4	40.57865	-74.25536	40.58002	-74.25478	1	7/3/2017	487.6	548.5	518.0	1.6	0%	N/A	0.40	0.30	0.35	2.73	8.0	Microsurface
Blair Rd	NB	1.4	1.5	40.58002	-74.25478	40.58142	-74.25419	1	7/3/2017	324.3	358.8	341.5	2.4	0%	N/A	0.51	0.29	0.40	0.99	11.5	Microsurface
Blair Rd	NB	1.5	1.6	40.58142	-74.25419	40.58281	-74.25368	1	7/3/2017	226.6	280.3	253.4	3.6	0%	N/A	0.23	0.19	0.21	1.61	11.5	Microsurface
Blair Rd	NB	1.6	1.7	40.58281	-74.25368	40.58419	-74.25335	1	7/3/2017	376.9	450.2	413.5	3.9	0%	N/A	0.20	0.20	0.20	1.73	11.5	Microsurface
Blair Rd	NB	1.7	1.8	40.58419	-74.25335	40.58566	-74.25302	1	7/3/2017	255.7	378.4	317.0	3.5	0%	N/A	0.30	0.27	0.29	1.18	11.5	Microsurface
Blair Rd	NB	1.8	1.9	40.58566	-74.25302	40.58707	-74.25271	1	7/3/2017	383.5	368.3	375.9	3.8	0%	N/A	0.21	0.22	0.22	1.99	11.5	Micromill & HPTO
Blair Rd	NB	1.9	2.0	40.58707	-74.25271	40.58854	-74.25274	1	7/3/2017	189.8	195.0	192.4	3.7	0%	N/A	0.30	0.27	0.29	0.66	11.5	Micromill & HPTO
Blair Rd	NB	2.0	2.1	40.58854	-74.25274	40.58996	-74.25304	1	7/3/2017	231.3	310.2	270.8	3.6	0%	N/A	0.23	0.25	0.24	2.61	11.5	Micromill & HPTO
Blair Rd	NB	2.1	2.2	40.58996	-74.25304	40.59136	-74.25264	1	7/3/2017	168.2	216.6	192.4	3.9	0%	N/A	0.22	0.20	0.21	0.62	11.5	Micromill & HPTO
Blair Rd	NB	2.2	2.3	40.59136	-74.25264	40.59271	-74.25213	1	7/3/2017	142.9	196.6	169.8	3.5	0%	N/A	0.26	0.25	0.26	0.50	11.5	Micromill & HPTO
Blair Rd	NB	2.3	2.4	40.59271	-74.25213	40.59417	-74.25213	1	7/3/2017	142.9	196.6	169.8	3.8	0%	N/A	0.23	0.24	0.24	0.56	11.5	Micromill & HPTO
Blair Rd	NB	2.4	2.5	40.59417	-74.25213	40.59555	-74.25230	1	7/3/2017	130.3	166.1	148.2	3.6	0%	N/A	0.23	0.42	0.33	2.10	11.5	Micromill & HPTO



Typical Summary Spreadsheet Showing Pavement Condition Data

For QA of the videolog images the AID Team will examine the images to identify and catalog abnormalities. Items to look for in the imagery include distortion, sun overexposure, darkness, occasions when parts of the collection vehicle is visible in the image, and others. 5% of the images will be randomly selected and reviewed initially for QA purposes. AID's Quality Management Plan will detail action plans for correcting all detected errors, both random and systematic.

With regard to the schedule for the data processing and reporting, this task will begin at approximately Week 5 from NTP and be completed by Week 14 from NTP, at which time draft deliverables for the entirety of the project will be submitted to the SJTPO/Counties. This schedule has been devised to allow 2 weeks for review of the draft deliverables by the SJTPO/Counties and an additional 3 weeks for the AID Team to resolve comments and submit the final deliverables, leaving a comfortable time window for completion of all work ahead of February 20, 2019.

Image File	LaneDes	Latitude	Longitude	Veh. Speed (mph)	Date of Testing	Time of Testing
Stone_Rd_EB_Lane1_-146.jpg	1	39.82432	-75.01228	28.9	8/14/2017	2:04:03 PM
Stone_Rd_EB_Lane1_-126.jpg	1	39.82427	-75.01223	27.9	8/14/2017	2:04:03 PM
Stone_Rd_EB_Lane1_-105.jpg	1	39.82423	-75.01218	26.8	8/14/2017	2:04:04 PM
Stone_Rd_EB_Lane1_-84.jpg	1	39.82418	-75.01214	25.8	8/14/2017	2:04:04 PM
Stone_Rd_EB_Lane1_-65.jpg	1	39.82414	-75.01209	25.5	8/14/2017	2:04:05 PM
Stone_Rd_EB_Lane1_-25.jpg	1	39.82406	-75.01200	26.0	8/14/2017	2:04:06 PM
Stone_Rd_EB_Lane1_-21.jpg	1	39.82405	-75.01199	26.0	8/14/2017	2:04:06 PM
Stone_Rd_EB_Lane1_0.jpg	1	39.82401	-75.01194	26.2	8/14/2017	2:04:06 PM
Stone_Rd_EB_Lane1_20.jpg	1	39.82398	-75.01188	26.5	8/14/2017	2:04:07 PM
Stone_Rd_EB_Lane1_41.jpg	1	39.82394	-75.01182	26.7	8/14/2017	2:04:07 PM
Stone_Rd_EB_Lane1_62.jpg	1	39.82391	-75.01176	27.6	8/14/2017	2:04:08 PM
Stone_Rd_EB_Lane1_81.jpg	1	39.82389	-75.01170	28.5	8/14/2017	2:04:08 PM
Stone_Rd_EB_Lane1_102.jpg	1	39.82386	-75.01164	29.3	8/14/2017	2:04:09 PM
Stone_Rd_EB_Lane1_123.jpg	1	39.82384	-75.01157	30.1	8/14/2017	2:04:09 PM
Stone_Rd_EB_Lane1_144.jpg	1	39.82381	-75.01150	30.6	8/14/2017	2:04:10 PM
Stone_Rd_EB_Lane1_...jpg	1					
Stone_Rd_EB_Lane1_185...g	1					
Stone_Rd_EB_Lane1_205.jpg	1					
Stone_Rd_EB_Lane1_227.jpg	1					
Stone_Rd_EB_Lane1_247.jpg	1					
Stone_Rd_EB_Lane1_266.jpg	1					
Stone_Rd_EB_Lane1_287.jpg	1					
Stone_Rd_EB_Lane1_308.jpg	1					

Typical Summary Spreadsheet (and Image Link) for Video Images

Task 2 Deliverables:

- MS Excel spreadsheet for each road segment within each of 4 SJTPO counties, including following data for each tenth of a mile:
  - Positional data (route, direction, lane, milepost, GPS coordinates)
  - Pertinent inventory data (NHS status, age, traffic volume, etc.)
  - IRI, Cracking Percent, Rutting, Faulting, PSR
  - Pavement treatment type (per decision logic)
- MS Excel spreadsheet for each road segment within each of 4 SJTPO counties, including links to stitched video and LCMS images every 20 ft. and the following information:
  - Positional data (route, direction, lane, milepost, GPS coordinates)
  - Date and time of testing
  - Vehicle speed

Task 3: GIS

Building upon the data collected and processed under the previous tasks, during Task 3 the AID Team will produce and deliver a GIS database and accompanying metadata containing existing and collected roadway pavement condition data referenced to roadway segments. To address the different challenges of the project and achieve its objectives, the team will complete the GIS task using a multi-pronged approach. This will provide for technical expert input and approval, a robust quality control methodology, and ample opportunities for subject matter experts throughout the process.

Develop Specifications

The AID Team will discuss with SJTPO/Counties, an appropriate database schema to ensure a consistent dataset among all four counties. The agreed-upon geometric network for representing roadways is expected to consist of point and linear features that will have pre-defined connectivity based on existing world relationships. As such, existing New Jersey road centerline data and specifications will help to serve as the foundation upon which the SJTPO/Counties roadway data specification is built.

Data Integration

This work will focus on integrating the collected data (IRI, rut depth, faulting, cracking percent, PSR, and video/LCMS images) into the roadway geodatabase. The AID Team will coordinate its data collection efforts to ensure a smooth transfer of information between the collection, processing, and GIS tasks.

Quality Control

The AID Team will conduct data clean-up and implement quality control methods. Metadata for all datasets (geospatial, tabular, etc.) will be generated at this point. The final deliverables will consist of the spatial datasets in geodatabase format compatible with ESRI ArcGIS 10.4, and previous versions as necessary, as well as the metadata generated for those files. The AID Team will organize the data package and deliverables in such a manner that SJTPO and County staff will easily be able to create their own maps within ArcMap. The data will be presented and summarized as defined in the GIS specifications developed in the subtask above, with an example of IRI data representation provided below. The AID Team will also be available to SJTPO/County GIS staff to assist in integrating the new data and answering questions about the database.

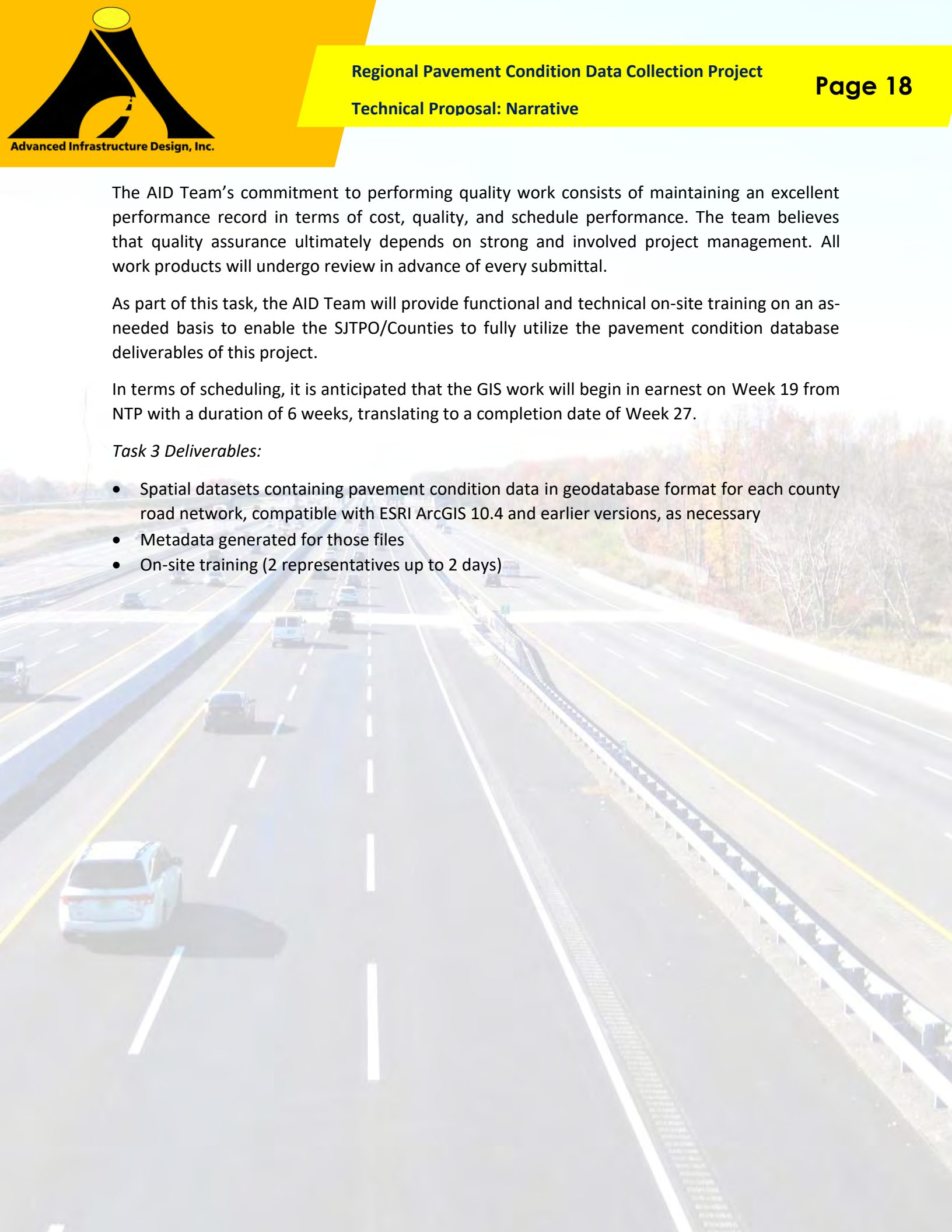
The AID Team's commitment to performing quality work consists of maintaining an excellent performance record in terms of cost, quality, and schedule performance. The team believes that quality assurance ultimately depends on strong and involved project management. All work products will undergo review in advance of every submittal.

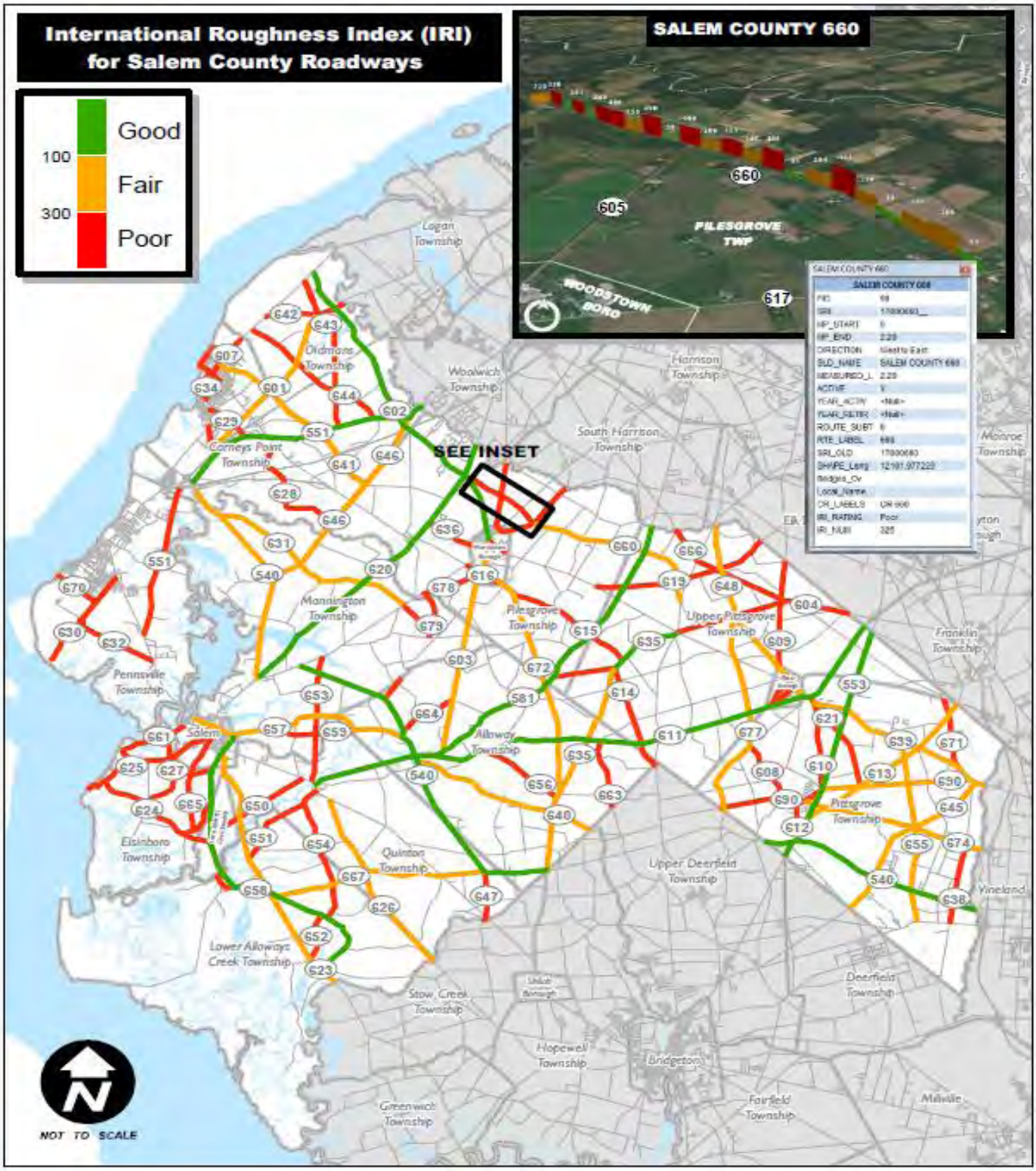
As part of this task, the AID Team will provide functional and technical on-site training on an as-needed basis to enable the SJTPO/Counties to fully utilize the pavement condition database deliverables of this project.

In terms of scheduling, it is anticipated that the GIS work will begin in earnest on Week 19 from NTP with a duration of 6 weeks, translating to a completion date of Week 27.

Task 3 Deliverables:

- Spatial datasets containing pavement condition data in geodatabase format for each county road network, compatible with ESRI ArcGIS 10.4 and earlier versions, as necessary
- Metadata generated for those files
- On-site training (2 representatives up to 2 days)





Proposed IRI Data Presentation (for illustrative purposes only, not actual data)

ADVANCED INFRASTRUCTURE DESIGN, INC.

South Jersey Transportation Planning Organization

REGIONAL PAVEMENT CONDITION DATA COLLECTION PROJECT

	AID								***AECOM***			
Project Tasks:	***ALL TASKS***	***ALL TASKS***	***2: Data Collection & Processing***	***2: Data Collection & Processing***	***2: Data Collection & Processing***	***2: Data Collection & Processing***	***2: Data Collection & Processing***		***1: Project Coordination***	***3: GIS***	***3: GIS***	
Role on Tasks:	***Project Manager***	***Principal in Charge***	***Data Processing***	***Data Processing***	***QA/QC & Pavement Treatment***	***Pavement Treatment***	***Pavement Treatment***		***Project Coordination***	***GIS QA/QC & Pavement Eng.***	***GIS***	
Project Titles/ASCE Grade/Name of Staff Proposed:	**Project Manager ASCE V Manuel Celaya, PhD, PE**	**Principal in Charge ASCE VIII Kaz Tabrizi, PhD, PE**	**Data Collection/ Processing Lead ASCE IV Hadi Rashidi, PhD, PE**	**Engineer I ASCE I Danny Gomez**	**Data QA/QC Lead ASCE VII Mike Frabizzio, PE**	**Senior Engineer ASCE III Abu Faruk**	**Engineer I ASCE I Kai Waechter**	**Total Hrs.**	**AECOM Sam Donelson**	**AECOM Kathy Keegan**	**AECOM Christopher Salvatico**	**Total Hrs.**
Task 1: Project Coordination & Setup	40	8	8	8	16			**80**	10			**10**
Task 2: Pavement Condition Data Collection, Processing & Reporting												
Data Collection (includes coordination)	16		8	80				**104**				**0**
QC	24	4	16		16			**60**				**0**
Data Processing & Reporting	40		16	80				**136**				**0**
QC	24	4	16		16			**60**				**0**
Treatment Analysis (including decision tree)	2				40	40	40	**122**		2		**2**
QC	8				16	16		**40**				**0**
Task 3: Geographic Information System	8							**8**		10	154	**164**
Meetings	24	8	8		16			**56**			16	**16**
Total Staff Hrs. by Company	186	24	72	168	120	56	40	**666**	10	12	170	**176**
Total Staff Hrs.- Grand Total	**842**											

June 13, 2018

Andrew Tracy, Program Engineer
South Jersey Transportation Planning Organization
782 South Brewster Road, Unit B6
Vineland, NJ 08361

Re: Cost Proposal – Regional Pavement Condition Data Collection Project- 1,491 miles of County Roadways

Dear Mr. Tracy:

Advanced Infrastructure Design, Inc. (AID) is pleased to submit our cost proposal in response to the subject SJTPO solicitation.

AID will lead approximately 85% of the work on this project as a certified NJ DBE/ESBE. As such, AID's proposed staff will meet and exceed the 12.44% DBE/ESBE goal. AID welcomes AECOM to the AID Team as its subconsultant for GIS support. AECOM brings a wealth of data collection and GIS experience to our team and couple with our expertise and experience, we are confident that we will deliver on all the requirements set forth in the RFP.

We look forward to the opportunity to deliver this project to you and exceed your expectations. Please feel free to contact me at (609)-838-2216, ext. 205) should you have any questions or need any additional information.

Sincerely,

Kaz Tabrizi, Ph.D., P.E.
Executive Vice President

ADVANCED INFRASTRUCTURE DESIGN, INC.

South Jersey Transportation Planning Organization

REGIONAL PAVEMENT CONDITION DATA COLLECTION PROJECT

	AID								***AECOM***			
Project Tasks:	***ALL TASKS***	***ALL TASKS***	***2: Data Collection & Processing***	***2: Data Collection & Processing***	***2: Data Collection & Processing***	***2: Data Collection & Processing***	***2: Data Collection & Processing***		***1: Project Coordination***	***3: GIS***	***3: GIS***	
Role on Tasks:	***Project Manager***	***Principal in Charge***	***Data Processing***	***Data Processing***	***QA/QC & Pavement Treatment***	***Pavement Treatment***	***Pavement Treatment***		***Project Coordination***	***GIS QA/QC & Pavement Eng.***	***GIS***	
Project Titles/ASCE Grade/Name of Staff Proposed:	**Project Manager ASCE V Manuel Celaya, PhD, PE**	**Principal in Charge ASCE VIII Kaz Tabrizi, PhD, PE**	**Data Collection/ Processing Lead ASCE IV Hadi Rashidi, PhD, PE**	**Engineer I ASCE I Danny Gomez**	**Data QA/QC Lead ASCE VII Mike Frabizzio, PE**	**Senior Engineer ASCE III Abu Faruk**	**Engineer I ASCE I Kai Waechter**	**Total Hrs.**	**AECOM Sam Donelson**	**AECOM Kathy Keegan**	**AECOM Christopher Salvatico**	**Total Hrs.**
Task 1: Project Coordination & Setup	40	8	8	8	16			**80**	10			**10**
Task 2: Pavement Condition Data Collection, Processing & Reporting												
Data Collection (includes coordination)	16		8	80				**104**				**0**
QC	24	4	16		16			**60**				**0**
Data Processing & Reporting	40		16	80				**136**				**0**
QC	24	4	16		16			**60**				**0**
Treatment Analysis (including decision tree)	2				40	40	40	**122**		2		**2**
QC	8				16	16		**40**				**0**
Task 3: Geographic Information System	8							**8**		10	154	**164**
Meetings	24	8	8		16			**56**			16	**16**
Total Staff Hrs.	186	24	72	168	120	56	40	**666**	10	12	170	**176**
Hourly Rate (Average ASCE Grade)	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]		[redacted]	[redacted]	[redacted]	
Direct Labor Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]		[redacted]	[redacted]	[redacted]	

Total Direct Labor Cost	**$30,316.22**	**Total Direct Labor Cost**	**$10,208.20**
Overhead (150%)	**$45,474.33**	**Overhead (132.81%)**	**$13,557.51**
Fixed Fee (21% of Labor)	**$6,366.41**	**Fixed Fee (21% of Labor)**	**$2,143.72**
TOTAL AID	**$82,156.96**	**TOTAL AECOM**	**$25,909.43**

Direct Expenses

LCMS Rental including data collection ($1,500 per day)	40	$60,000.00
Travel to Job-site & Meetings ($0.55/mile)	6000	$3,300.00
Total Direct Expense		**$63,300.00**

AID Staff will perform approximately 85% of the project and as a certified DBE/ESBE we will meet and exceed the 12.44% goal

GRAND TOTAL		**$171,366.39**

SOUTH JERSEY TRANSPORTATION PLANNING ORGANIZATION

RESOLUTION 1807-16: Approving the Selection of Advanced Infrastructure Design, Inc. as the Consultant for the Regional Pavement Condition Data Collection Study

WHEREAS, the South Jersey Transportation Planning Organization (SJTPO) is the Metropolitan Planning Organization (MPO) designated under Federal law for the southern region of New Jersey including Atlantic, Cape May, Cumberland, and Salem Counties; and

WHEREAS, the Fiscal Year 2019 SJTPO Unified Planning Work Program includes Federal Highway Administration planning funds for this project; and

WHEREAS, the Notice of Availability of Requests was sent to approximately 214 contacts on May 16, 2018; and

WHEREAS, the Request for Proposal (RFP) announcement and supplemental materials were also posted on the publicly accessible SJTPO website; and

WHEREAS, four (4) proposals were received; and

WHEREAS, the SJTPO Technical Advisory Committee endorsed the consultant selection committee with representatives from SJTPO, NJDOT, Atlantic County, Cumberland County, Cape May County, SJTA, and City of Vineland, who reviewed and evaluated the proposals in accordance with SJTPO's published criteria; and

WHEREAS, the Consultant Selection Committee recommends Advanced Infrastructure Design, Inc. (DBE) in association with AECOM serving as subconsultant; and

WHEREAS, the SJTPO TAC, at their July 9, 2018 meeting, endorsed the recommendation of the Consultant Selection Committee;

NOW THEREFORE BE IT RESOLVED, that the Policy Board of the South Jersey Transportation Planning Organization hereby approves the above selection for the Regional Signal Timing Initiative Study, with a maximum fee of $171,366.39 and 84.9% DBE participation; and

BE IT FURTHER RESOLVED, that the Policy Board authorizes the Executive Director to execute scope of work and cost modifications to the original contract amount, provided that funding is available.

BE IT FURTHER RESOLVED, that the Policy Board requests that the South Jersey Transportation Authority execute the appropriate contractual arrangements with the consultant on behalf of the SJTPO.

Certification

I hereby certify that the foregoing is a correct and true copy of a resolution adopted by the Policy Board of the South Jersey Transportation Planning Organization at its meeting of July 23, 2018.

John W. Risley /MB

John W. Risley, Secretary/Treasurer