SOUTH JERSEY TRANSPORTATION PLANNING ORGANIZATION

ITEM 1901-03: Amending the Scope of Services and Approving a Contract Modification for the Regional Pavement Data Collection Technical Study

PROPOSAL

At its January 14, 2019 meeting, the SJTPO Technical Advisory Committee recommended that the Policy Board amend the originally approved scope of services and approve a modification to the contract for the Regional Pavement Data Collection technical study.

BACKGROUND

On July 23, 2018, with Resolution 1807-16 (Approving the Selection of Advanced Infrastructure Design, Inc. as Consultant for the Regional Pavement Condition Data Collection Technical Study), the Policy Board approved the selection of the consultant with a maximum fee of $171,366.39. On July 31, 2018, a Subcontract Agreement was fully executed between Advanced Infrastructure Design, Inc. and the South Jersey Transportation Authority authorizing work to commence on the technical study.

On behalf of SJTPO's four counties, SJTPO is overseeing Regional Pavement Data Collection services. The technical study will collect, process, and map pavement condition data on approximately 1,500 miles of county roadways in Atlantic, Cape May, Cumberland, and Salem Counties.

Data collection has been completed in Atlantic and Cape May Counties, with collection in Salem and Cumberland Counties nearly complete; after which data processing will occur. The current scope of work includes processing only for the pavement condition data. However, because right-of-way imagery is being collected, there is an opportunity to collect asset inventory data. The counties have expressed interest in having the locations of sidewalks, intersection ramps, guardrails, inlets, and manholes inventoried from the right-of-way (ROW) imagery.

As such, Advanced Infrastructure Design, Inc. prepared a revised scope, outlining the proposed technical approach along with an associated cost. The increased scope would result in an additional $68,452.00; increasing the total of the contract from $171,366.39 to $239,818.39.

While a Contract Modification is required, a request for additional funds from NJDOT is not needed. A letter notifying NJDOT and FHWA of the change in scope and cost will be provided as information only. The increase will be funded through balances remaining from Task 18/406: Program Support Data Collection and Task 19/402: Program Support Data Collection.

Project Understanding

As part of the ongoing "Regional Pavement Condition Data Collection Project", the South Jersey Transportation Planning Organization (SJTPO) has requested an addendum proposal from Advanced Infrastructure Design, Inc. (AID) that complements the ongoing study. The objective of the additional scope is to extract assets of interest from the georeferenced data that is being collected as part the project. Assets that will be extracted include sidewalks, ADA (Americans with Disabilities Act) ramps, guiderails, and optionally, manholes and inlets. Identified assets will be populated into a comprehensive database with georeferenced information that will be easily integrated into each of the four (4) SJTPO County GIS databases.

For the ongoing project, comprehensive pavement data with AID's Integrated Testing Vehicle (ITV) is being collected. This data includes International Roughness Index (IRI) measurements, 3D distress mapping, video imagery, and Ground Penetrating Radar (GPR) data. AID's ITV also records GPS coordinates (latitude and longitude) to allow for easy integration of pavement data with the Counties' geodatabases. This data is being collected on approximately 1,491 centerline miles of roadways in the SJTPO region across Atlantic, Cape May, Cumberland, and Salem Counties.

To extract assets of interest and populate each County's database, AID will use an in-house developed software application to extract assets from the georeferenced imagery database. All this information will be tied to GPS coordinates and exported as a GIS database.

Approach

The AID Team will take advantage of the data being collected from AID's Integrated Testing Vehicle, which is an all-encompassing automated pavement condition and thickness data collection van, with the capability to also collect right-of-way data. The available data will be utilized, coupled with the expertise of an experienced group of engineers and GIS specialists to extract asset data from the SJTPO County Routes. This cost-effective approach will provide a network level database for all assets of interest, eliminating the need to travel all four (4) County roadway networks again.

The additional scope of work is detailed in the following tasks:

Task 1: Collection of Georeferenced Videolog

As noted above, AID's ITV is currently collecting pavement data as part of the ongoing "Regional Pavement Condition Data Collection Project".

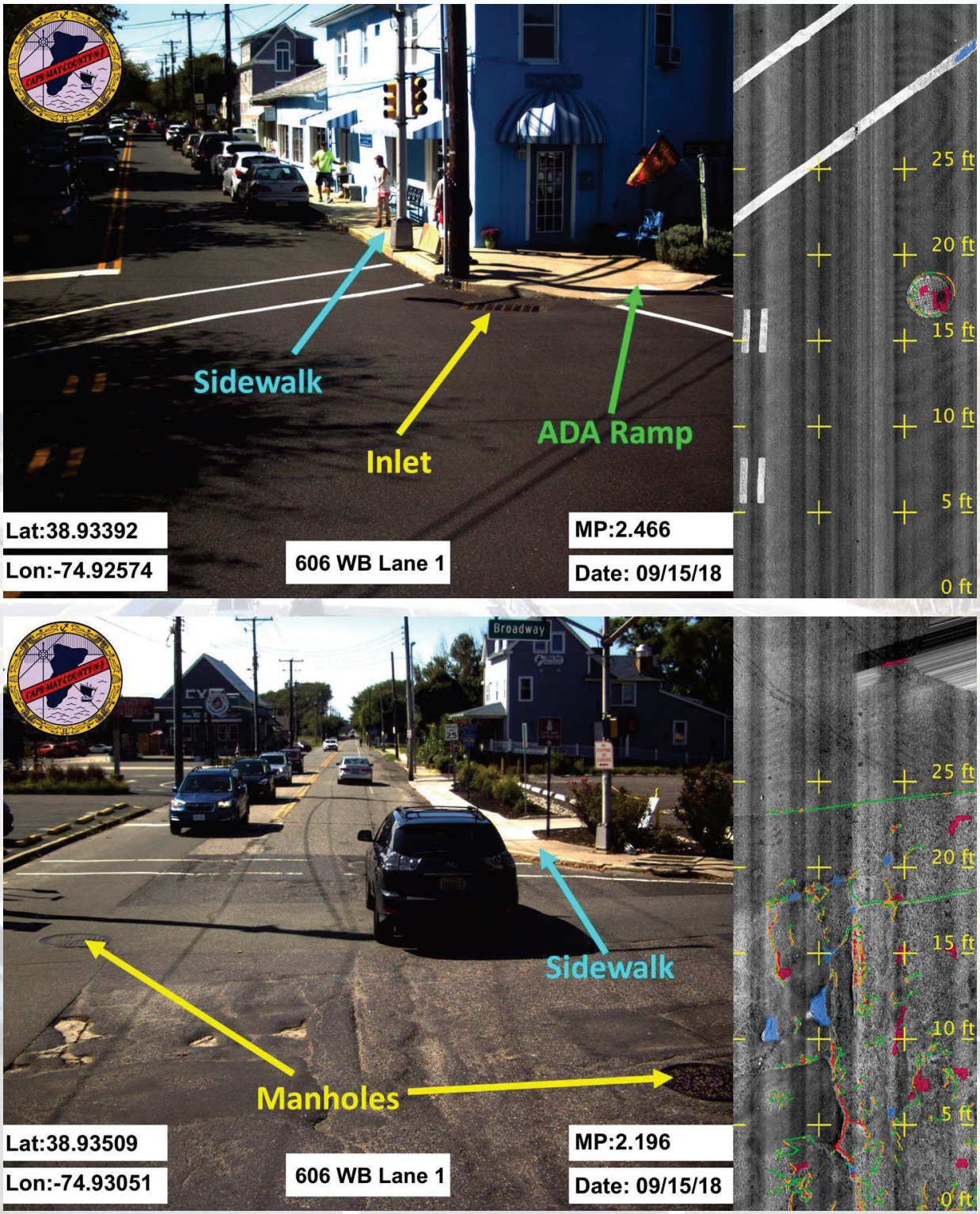
All pavement condition data is being simultaneously collected at posted roadway speeds without interruption to traffic using AID's ITV. Data collected with this vehicle includes: high-resolution video images; continuous IRI, rut depth, faulting, and cracking using a Laser Crack Measurement System (LCMS); and, continuous GPR data that can be used to estimate pavement thickness. All this information is recorded with GPS coordinates (latitude and longitude) having sub-centimeter accuracy to allow for easy integration with each County's geodatabase. 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.

Video is being 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 is being collected in the field then post-processed in the office to show the roadway information on-screen. Roadway video images are being recorded at 20 ft. intervals. 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 are stitched together to provide a more comprehensive view of the pavement investigated. Typical examples of a screen shot from two raw images (video and LCMS) obtained on Cape May county road 606 are shown below.

To achieve the objectives of this addendum proposal, the georeferenced images will be used to select assets of interest and export type (guiderail, ADA ramp, sidewalk, manhole), location (milepost) and GPS coordinates (latitude, longitude). Please note that evaluating the condition of each asset is not included in the scope of this proposal. Also, please note that assets that are not seen on the recorded images (due to obstructions) will not be extracted.

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



Stitched Camera Image and LCMS Data that Will Be Used for Asset Extraction

Task 2: Asset Extraction

Identified assets from the georeferenced image database will be exported as excel tables that will include approximate milepost and GPS coordinates for easy integration into each County's geodatabase. Typical examples for Cape May County Route 606 are shown below. In addition, a Google Earth file for each county road with all identified assets will be provided for easy reference.

EASTBOUND ADA RAMPS			
#	MP	Lat	Lon
1	2.454	38.93392	-74.92596
2	2.320	38.93449	-74.92833
3	2.312	38.93453	-74.92848
4	2.196	38.93502	-74.93054
5	2.189	38.93505	-74.93067
6	2.108	38.93538	-74.93210
7	2.100	38.93542	-74.93225
8	0.164	38.94364	-74.96661

WESTBOUND ADA RAMPS			
#	MP	Lat	Lon
1	2.323	38.93457	-74.92824
2	2.297	38.93468	-74.92872
3	2.195	38.93512	-74.93053
4	0.164	38.94373	-74.96657

EASTBOUND SIDEWALK			
	MP	Lat	Lon
Start	2.584	38.93314	-74.92395
End	2.067	38.93555	-74.93278

WESTBOUND SIDEWALK			
	MP	Lat	Lon
Start	2.584	38.93319	-74.92381
End	2.067	38.93554	-74.93232

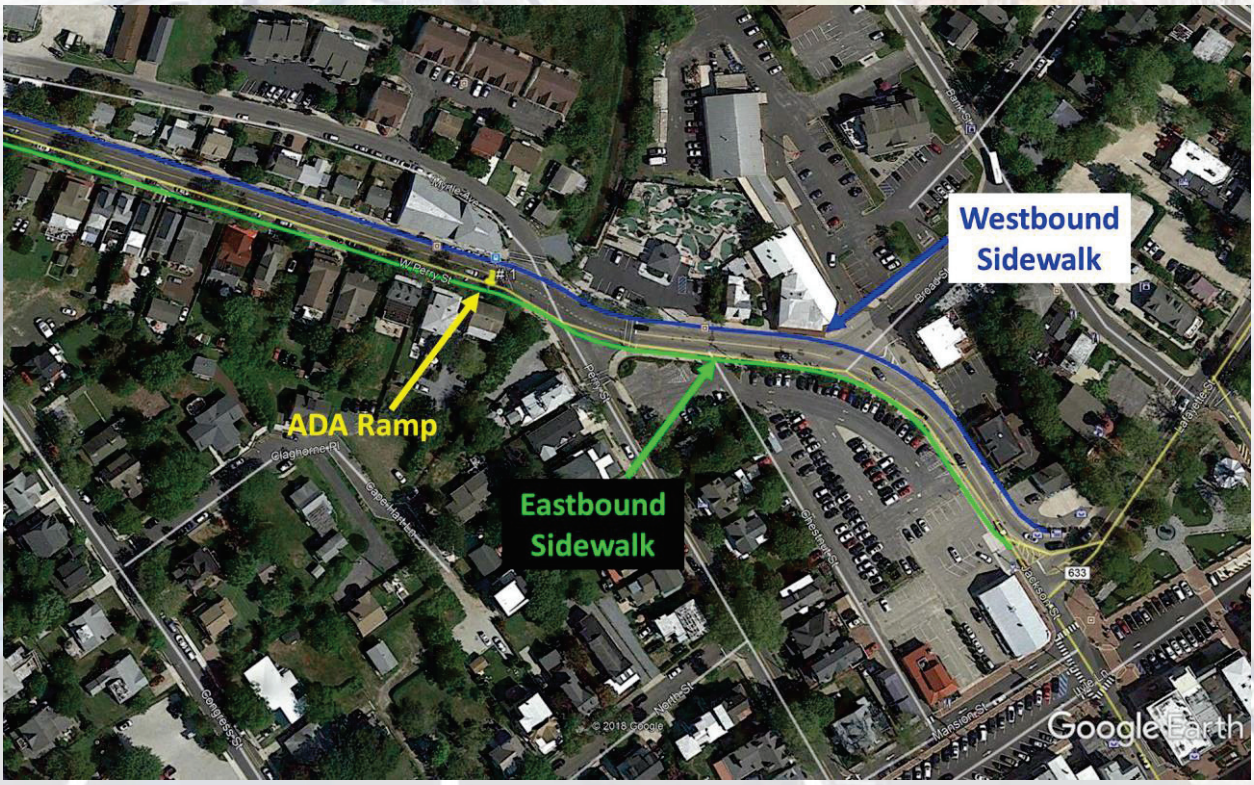
Example of Tabulated Assets, Cape May County Road 606

With regard to the schedule for the data processing and reporting, this task will begin as soon as Notice-to-Proceed (NTP) is received and be completed by May 31, 2019, 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 2 weeks for the AID Team to resolve comments and submit the final deliverables, leaving a reasonable window of time for the completion of all work ahead of June 30, 2019.

Task 2 Deliverables:

- MS Excel spreadsheet for each road segment within each of the 4 SJTPO counties, including the following data:
  - ADA Ramps (asset #, direction, milepost, GPS coordinates)
  - Guiderails (Start, End, direction, milepost, GPS coordinates)
  - Sidewalks (Start, End, direction, milepost, GPS coordinates)
  - Manholes & Inlets (asset #, direction, milepost, GPS coordinates). *Optional*

- Google Earth file with all assets identified. Please see below for typical example obtained on Cape May County Route 606.



Google Earth File with Identified Assets on Cape May County Route 606

OPTION 2. EXTRACTION OF ASSETS (including GUIDERAILS, ADA RAMPS, SIDEWALKS, MANHOLES and INLETS)

ADVANCED INFRASTRUCTURE DESIGN, INC. *South Jersey Transportation Planning Organization* *REGIONAL PAVEMENT CONDITION DATA COLLECTION PROJECT ADDENDUM: ASSET EXTRACTION & REPORTING*						
	AID					
Project Tasks:	*ALL TASKS*	*ALL TASKS*	*ALL TASKS*	*2: Data Processing & Reporting*	*2: Data Processing & Reporting*	
Role on Tasks:	*Project Manager*	*Principal in Charge*	*QA/QC*	*Asset Extraction & GIS*	*Asset Extraction & GIS*	
Project Titles/ASCE Grade/Name of Staff Proposed:	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	Total Hrs.
Task 1: Project Coordination & Setup	4		8			12
Task 2: Data Processing & Reporting						
Data Processing & Reporting	16		6	260	260	542
QC	32		6	60	60	158
Meetings						0
Total Staff Hrs.	52	0	20	320	320	712
Hourly Rate (Average ASCE Grade)	$50.27	$88.50	$63.13	$38.59	$28.23	
Direct Labor Cost	$2,614.04	$0.00	$1,262.60	$12,348.80	$9,033.60	
Total Direct Labor Cost		$25,259.04				
Overhead (150%)		$37,888.56				
Fixed Fee (21% of Labor)		$5,304.40				
TOTAL AID		$68,452.00				
Direct Expenses						
N/A	0	$0.00		AID Staff will perform 100% of the project and as a certified DBE/ESBE we will meet and exceed the 12.44% goal		
Total Direct Expense		$0.00				
GRAND TOTAL		$68,452.00				

COST BREAKDOWN BY COUNTY (Manholes & Inlets Only)

Atlantic County		$3,751.24
Cape May County		$2,142.12
Cumberland County		$5,450.85
Salem County		$3,650.66
GRAND TOTAL (Additional Manholes/Inlets, All Counties)		$14,994.87

SOUTH JERSEY TRANSPORTATION PLANNING ORGANIZATION

RESOLUTION 1901-03: Approving the Scope of Services and Approving a Contract Modification for the Regional Pavement Data Collection Technical 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 as Task 19/401: Regional Pavement Data Collection; and

WHEREAS, at their July 23, 2018 meeting, the Policy Board approved Advanced Infrastructure Design, Inc. as the consultant for the technical study with a maximum fee of $171,366.39; and

WHEREAS, a Subcontract Agreement between Advanced Infrastructure Design, Inc. and the South Jersey Transportation Authority was fully executed on July 31, 2018 with a Notice to Proceed issued on the same date; and

WHEREAS, the technical study will collect, process, and map pavement condition data on approximately 1,500 miles of county roadways in Atlantic, Cape May, Cumberland, and Salem Counties; and

WHEREAS, the four counties recently expressed interest in having the locations of sidewalks, intersection ramps, guardrails, inlets, and manholes inventoried from the right-of-way imagery added to the scope of work; and

WHEREAS, Advanced Infrastructure Design, Inc. has prepared a revised scope of work and cost for the additional work; and

WHEREAS, the costs associated with amending the scope, as described above, will be $68,452.00 above the original contract amount, resulting in a revised maximum fee of $239,818.39; and

WHEREAS, the additional cost will be funded through balances remaining from Task 18/406 Program Support Data Collection and Task 19/402 Program Support Data Collection within the Fiscal Year 2018 and 2019 SJTPO Unified Planning Work Program; and

WHEREAS, the amended scope of work and contract modification will not negatively impact the initial needs and objectives of the technical study; and

NOW THEREFORE BE IT RESOLVED, that the Policy Board of the South Jersey Transportation Planning Organization hereby approves the attached amended scope of work and cost, approving the contract modification for the Regional Pavement Data Collection Technical Study.

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 January 28, 2019.

John W. Risley, Secretary/Treasurer