



## MEMORANDUM

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April 14, 2011

TO: Board of Mayor and Aldermen

FROM: Eric S. Stuckey, City Administrator  
Kevin E. Comstock, ITS Project Manager  
David Parker, P.E., City Engineer  
Eric J. Gardner, P.E., Director of Engineering

SUBJECT: Consideration of a PSA for Construction Engineering and Inspection (CEI) Services Proposal Provided by AECOM for the TOC Phase 3 (Infrastructure and Upgrades Project)

### **Purpose**

The purpose of this memorandum is to provide the Board of Mayor and Aldermen (BOMA) with information to consider a professional services agreement (PSA) for the Construction Engineering and Inspection (CEI) Services with AECOM for the Traffic Operations Center (TOC) Phase 3 (Infrastructure and Upgrades Project).

### **Background**

On October 14, 2008, BOMA approved the design contract with AECOM for the TOC Phase 3 (Infrastructure and Upgrades Project). This project upgrades the existing system on SR 96 E from the TOC out to Arno Rd and along Royal Oaks. The City is ready to proceed with the construction of this project and by TDOT Local Programs and Federal Highway Administration is required to have the work overseen by a TDOT approved consultant.

### **Financial Impact**

AECOM's proposal indicates a cost of \$159,003.19 with a balance of \$6,000 unencumbered funding from the Design contract. The net result would be a new contract for \$153,003.19. TOC Staff recognized the need for CEI and submitted to the MPO for funding for it last year which was granted at 80/20 match. The City's portion for this contract will be \$30,600.64. Funding for the City's match is included within the current TOC budget.

### **Recommendation**

Staff recommends approval of the PSA with AECOM in the amount not to exceed \$153,003.19.

**AMENDMENT NO. 1 TO  
PROFESSIONAL SERVICES AGREEMENT  
FOR TRAFFIC OPERATIONS CENTER (TOC), PHASE 3  
INFRASTRUCTURE AND UPGRADES  
COF Contract No. 2011-0054**

**THIS AMENDMENT** is made and entered into on this the \_\_\_ day of April, 2011, by and between the **City of Franklin, Tennessee** ("City") and AECOM ("Consultant").

**WITNESSETH:**

**WHEREAS**, City and Consultant entered into a Professional Services Agreement ("Agreement") entitled Traffic Operations Center (TOC), Phase 3 Infrastructure and Upgrades for a fee of \$199,738.00, dated the 18<sup>th</sup> day of November, 2008; and

**WHEREAS**, the November 2008 Professional Services Agreement Consultant Fee was supplemented on November 10, 2009 to provide an additional \$38,793.00 fee to allow for the design of a new Systems Engineering Analysis (SEA) as required by the Federal Highway Administration (FHWA) and the Tennessee Department of Transportation (TDOT); and

**WHEREAS**, the TOC Phase 3 Infrastructure and Upgrades Project has been bid and is ready for construction/installation and by TDOT and FHWA requirements the Project is to be overseen by a TDOT approved Construction Engineering and Inspection (CEI) Services firm; and

**WHEREAS**, the City and the Consultant, who is approved by TDOT to perform CEI Services, have negotiated a fee acceptable to all parties and desire to enter into this Amendment for said CEI Services.

**NOW, THEREFORE**, in consideration of these premises and the mutual promises contained herein, it is agreed by and between the parties as follows:

1. The foregoing recitals are incorporated by reference as if fully stated herein.
2. Consultant's Responsibilities and Duties. Consultant agrees to perform the work as proposed in their March 5, 2011 **Request for Supplement #2 (Update), Project # TOC 08-02, Traffic Operations Center (TOC), Phase 3 Infrastructure and Upgrades (Exhibit A)** at the cost as provided for in the Estimate and Fee Proposal, Supplement #2, Revision 3, 3/3/11 (**Exhibit B**) of this Amendment, all of which shall be considered as an integral part hereof.

3. City's Responsibilities and Duties. City shall pay Consultant for the cost of the work as described in Exhibit A and Exhibit B in the **Amount Not to Exceed One Hundred Fifty-Nine Thousand Three and Nineteen/100 Dollars (\$159,003.19). Six Thousand and No/100 Dollars (\$6,000.00) of this Not to Exceed Fee is to be from the balance of fees previously approved for this Project, but unspent.**

City reserves the right to issue any payments jointly to the Consultant and Contractor when the City receives information that the Consultant has not paid its Contractor.

4. Waiver. Neither party's failure nor delay to exercise any of its rights or powers under this Amendment will constitute or be deemed a waiver or forfeiture of those rights or powers. For a waiver of a right or power to be effective, it must be in writing signed by the waiving party. An effective waiver of a right or power shall not be construed as either (a) a future or continuing waiver of that same right or power, or (b) the waiver of any other right or power.

5. Severability. If any term or provision of the Amendment is held to be illegal or unenforceable, the validity or enforceability of the remainder of the Amendment will not be affected.

6. Precedence. In the event of conflict between this Amendment and the provisions of the previous Agreement(s), or any other contract, agreement or other document to which this Amendment may accompany or incorporate by reference, the provisions of this Amendment will, to the extent of such conflict (or to the extent the Agreement is silent), take precedence unless such document expressly states that it is amending this Amendment.

7. Entire Agreement. The Amendment between the parties supersedes any prior or contemporaneous communications, representations or agreements between the parties, whether oral or written, regarding the subject matter of the entire Amendment. The terms and conditions of this Amendment may not be changed except by an amendment expressly referencing this Amendment by section number and signed by an authorized representative of each party.

8. Additions/Modifications. If seeking any addition or modification to the Amendment, the parties agree to reference the specific paragraph number sought to be changed on any future document or purchase order issued in furtherance of the Amendment, however, an omission of the reference to same shall not affect its applicability. In no event shall either party be bound by any terms contained in any purchase order, acknowledgement, or other writings unless: (a) such purchase order, acknowledgement, or other writings specifically refer to the Amendment or to the specific clause they are intended to modify; (b) clearly

indicate the intention of both parties to override and modify the Amendment; and (c) such purchase order, acknowledgement, or other writings are signed, with specific material clauses separately initialed, by authorized representatives of both parties.

9. Breach. Upon deliberate breach of the Amendment by either party, the non-breaching party shall be entitled to terminate the Amendment without notice, with all of the remedies it would have in the event of termination, and may also have such other remedies as it may be entitled to in law or in equity.

10. Survival. This Amendment shall survive the completion of or any termination of the original contract, revised contract, or agreement or other document to which it may accompany or incorporate by reference.

All other provisions of the Agreement dated November 18, 2008 and the Supplement of November 10, 2009, are unchanged and remain in full force and effect.

IN WITNESS WHEREOF, the parties have executed this Amendment.

**The CITY OF FRANKLIN, TENNESSEE**

**AECOM**

By: \_\_\_\_\_  
**Dr. Ken Moore**  
Mayor  
Date: \_\_\_\_\_

By: \_\_\_\_\_  
Print: \_\_\_\_\_  
Title: \_\_\_\_\_  
Date: \_\_\_\_\_

**Attest:**

\_\_\_\_\_  
**Eric S. Stuckey**  
City Administrator  
Date: \_\_\_\_\_

**Approved as to form:**

\_\_\_\_\_  
Shauna R. Billingsley, City Attorney

**AMENDMENT NO. 1 TO  
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**WHEREAS**, the TOC Phase 3 Infrastructure and Upgrades Project has been bid and is ready for construction/installation and by TDOT and FHWA requirements the Project is to be overseen by a TDOT approved Construction Engineering and Inspection (CEI) Services firm; and

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**AECOM**

By: \_\_\_\_\_  
**Dr. Ken Moore**  
Mayor  
Date: \_\_\_\_\_

By: \_\_\_\_\_  
Print: \_\_\_\_\_  
Title: \_\_\_\_\_  
Date: \_\_\_\_\_

**Attest:**

\_\_\_\_\_  
**Eric S. Stuckey**  
City Administrator  
Date: \_\_\_\_\_

**Approved as to form:**

\_\_\_\_\_  
Shauna R. Billingsley, City Attorney

**CITY OF FRANKLIN, TENNESSEE**

**ESTIMATE AND FEE PROPOSAL**

**Supplement #2 (Revision 3, 3/3/11)**

**FRANKLIN PROJECT TOC 08-02**

**TDOT PIN# 103487.00**

**Traffic Operations Center (TOC) Phase 3  
Infratstructure and Upgrades**

**AECOM Project # 60092781**



220 Athens Way, Suite 200  
Nashville, TN 37228

Prepared By:	Brian Hall, PE
Date Prepared:	3/3/2011
Phone:	615-313-0355
FAX:	615-244-8760
E-mail:	<a href="mailto:brian.hall@aecom.com">brian.hall@aecom.com</a>



CITY OF FRANKLIN, TENNESSEE

FRANKLIN PROJECT TOC 08-02  
ESTIMATED MANPOWER REQUIREMENTS

3/3/2011

ACTIVITY	MAN-DAYS					TOTAL MAN- DAYS
	PD	PM	SE	E	S	
<b>1 - Inspection of network portion of the project</b>						
a. Develop Test Procedures	0.1	0.5	1.0	0.0	0.0	1.6
b. Stand Alone Tests (assume 2 days for all testing)	1.0	3.0	3.0	0.0	0.0	7.0
i. CCTV (8)	0.0	0.0	0.0	0.0	0.0	0.0
ii. Traffic Signal Controllers (19)	0.0	0.0	0.0	0.0	0.0	0.0
iii. Conflict Monitors (19)	0.0	0.0	0.0	0.0	0.0	0.0
iv. Uninterrupted Power Supplies (23)	0.0	0.0	0.0	0.0	0.0	0.0
v. Terminal Servers (21)	0.0	0.0	0.0	0.0	0.0	0.0
c. Network Sub-System Test (assume 4 days for all)	2.0	5.0	5.0	0.0	0.0	12.0
i. CCTV (8)	0.0	0.0	0.0	0.0	0.0	0.0
ii. Traffic Signal Controllers (19)	0.0	0.0	0.0	0.0	0.0	0.0
iii. Conflict Monitors (19)	0.0	0.0	0.0	0.0	0.0	0.0
iv. Uninterrupted Power Supplies (23)	0.0	0.0	0.0	0.0	0.0	0.0
v. Terminal Servers (21)	0.0	0.0	0.0	0.0	0.0	0.0
d. Network System Wide Test (support for COF)	2.0	5.0	5.0	0.0	0.0	12.0
i. CCTV (8)	0.0	0.0	0.0	0.0	0.0	0.0
ii. Traffic Signal Controllers (19)	0.0	0.0	0.0	0.0	0.0	0.0
iii. Conflict Monitors (19)	0.0	0.0	0.0	0.0	0.0	0.0
iv. Uninterrupted Power Supplies (23)	0.0	0.0	0.0	0.0	0.0	0.0
v. Terminal Servers (21)	0.0	0.0	0.0	0.0	0.0	0.0
e. Compile Test Results	0.3	1.0	1.0	0.0	0.0	2.3
f. Re-test of failed equipment	0.1	1.3	1.3	0.0	0.0	2.6
g. Final System Acceptance	0.3	0.5	0.5	0.0	0.0	1.3
SUBTOTAL	5.8	16.3	16.8	0.0	0.0	38.8
<b>2 - TDOT and Project Specific CEI Requirements</b>						
a. Pre-Construction Meeting	1.0	1.0	1.0	1.0	0.0	4.0
b. Review of Contract / subcontract documents as needed	0.0	2.0	0.0	0.0	0.0	2.0
c. Daily diaries by the CEI Consultant – on job at least once a day, includes employee interviews for DBE compliance and weekly payroll reviews	0.0	0.0	0.0	70.9	4.5	75.4
d. Review/Approve shop drawings and submittals	0.3	4.0	1.0	0.0	0.0	5.3
e. Bi-weekly progress meetings with City and TDOT / FHWA representatives (20)	2.0	10.0	2.0	0.0	0.0	14.0
f. Material Testing per TDOT Standard Operating Procedures	0.0	3.0	0.0	5.0	0.0	8.0
g. Fiber Optic Testing	0.0	5.0	5.0	0.0	0.0	10.0
h. Field measurement of installed quantities	0.0	0.0	0.0	0.0	0.0	0.0
i. Submit lane closure requests to TDOT	0.0	1.0	0.0	0.0	0.0	1.0
j. Monthly progress payment processing	0.0	2.3	0.0	3.4	0.0	5.6
k. Coordination with railroad/utilities/contractor	0.0	2.0	0.0	0.0	0.0	2.0
l. RFI's	0.0	1.0	0.0	0.0	0.0	1.0
m. Change Order reviews	0.0	1.0	0.0	0.0	0.0	1.0
n. As-Built drawing review	0.0	0.5	0.0	0.0	0.0	0.5
o. Final inspection, punch list, acceptance	0.0	2.0	0.0	0.0	0.0	2.0
p. Burn-in	1.0	1.0	1.0	0.0	0.0	3.0
SUBTOTAL	4.3	35.8	10.0	80.3	4.5	134.8
<b>TOTAL</b>	<b>10.00</b>	<b>52.00</b>	<b>26.75</b>	<b>80.25</b>	<b>4.50</b>	<b>173.50</b>

**CITY OF FRANKLIN, TENNESSEE  
FRANKLIN PROJECT TOC 08-02  
Traffic Operations Center (TOC) Phase 3  
Infratstructure and Upgrades**

3/3/2011

**MANDAY SUMMARY**

ACTIVITY	MANDAYS					TOTAL MANDAYS / DIRECT LABOR
	PD	PM	SE	E	S	
Direct Labor Rate per ManDay	\$554.72	\$324.24	\$358.64	\$240.00	\$200.00	
<b>1 - Inspection of network portion of the project</b>						
Man-Days	5.75	16.25	16.75	0.00	0.00	38.75
Direct Labor	\$3,189.64	\$5,268.90	\$6,007.22	\$0.00	\$0.00	\$14,465.76
<b>2 - TDOT and Project Specific CEI Requirements</b>						
Man-Days	4.25	35.75	10.00	80.25	4.50	134.75
Direct Labor	\$2,357.56	\$11,591.58	\$3,586.40	\$19,260.00	\$900.00	\$37,695.54
<b>SUB TOTALS</b>						
Man-Days	10.00	52.00	26.75	80.25	4.50	173.50
Direct Labor	\$5,547.20	\$16,860.48	\$9,593.62	\$19,260.00	\$900.00	\$52,161.30

PD	Project Director
PM	Project Managers
PE	Project Engineers (P.E.'s)
SE	Senior Engineers / Technical Specialists
E	Engineers / Designers
T	Technicians / CADD Operators
S	Secretary/Administrative Assistants

**CITY OF FRANKLIN, TENNESSEE**  
**FRANKLIN PROJECT TOC 08-02**

**Traffic Operations Center (TOC) Phase 3**  
**Infrastructure and Upgrades**

3/3/2011

**DIRECT COSTS**

<b>Reproduction Costs:</b>			<b>Item Subtotal</b>	<b>Total Cost</b>
	<b>Item Description</b>	<b>Number / Unit</b>	<b>Unit Price</b>	
	8.5" x 11" copies	1000	\$ 0.15	\$ 150.00
	Full size bond	0	\$ -	\$ -
	11" x 17" copies	0	\$ -	\$ -
	Full size vellum	0	\$ -	\$ -
	Half size vellum	0	\$ -	\$ -
	Full size mylar	0	\$ -	\$ -
				\$ 150.00
<b>Travel:</b>				
	<b>Number of Trips</b>	<b>No. of Miles/No. of People</b>	<b>RATE *</b>	
Per Diem	9.00 Man-Days	X 2.00 People X	\$ 54.00 Per Day	= \$ 972.00
Local Travel Miles	200.00 Round Trips	X 75.00 Miles X	\$ 0.47 Per Mile	= \$ 7,050.00
Transportation	4.00 Round Trips	X 2.00 People X	\$ 400.00 Per Person	= \$ 3,200.00
Rental Car	9.00 Nights	X 1.00 People X	\$ 65.00 Per Day	= \$ 585.00
Lodging	9.00 Nights	X 2.00 People X	\$ 117.00 Per Person	= \$ 2,106.00
				\$ 13,913.00
<b>Other Expenses:</b>				
	<b>Item Description</b>	<b>Number / Unit</b>	<b>Unit Price</b>	
		0	\$ -	\$ -
	Shipping & Postage	0	\$ 25.00	\$ -
	Binders & covers	5	\$ 6.00	\$ 30.00
	Parking	20	\$ 8.00	\$ 160.00
	700MB CD's w/ case	3	\$ 5.00	\$ 15.00
	KS Ware (cylinders or density testing)	1	\$ 1,000.00	\$ 1,000.00
		0	\$ -	\$ -
				\$ 1,205.00
<b>TOTAL DIRECT EXPENSES</b>				<b>\$ 15,268.00</b>

**CITY OF FRANKLIN, TENNESSEE**

**FRANKLIN PROJECT TOC 08-02  
FEE ESTIMATE**

3/3/2011

<b>Data For Fee Calculations</b>	
Overhead Rate =	<u>1.4500</u>
** (Maximum overhead rate = 1.45)	
Design Direct Labor Labor =	\$ 52,161.30
Survey Direct Labor =	\$ -
Total Direct Labor =	\$ 52,161.30
Cost for net fee basis =	\$ 127,795.19 *
Net Fee =	13.0% *

<b>Total Project</b>	
1 Direct Labor	= \$52,161.30
2 Overhead (Overhead Rate = <u>1.4500</u> ) (Overhead rate X direct labor)	= \$ 75,633.89
3 <b>Subtotal 1 + 2</b>	= \$ 127,795.19
4 Net Fee = 13.0% (Rounded to nearest \$10.)	= \$ 15,940.00
5 <b>Subtotal 3 + 4</b>	= \$ 143,735.19
6 Direct Expense (Itemize and attach) Other Sub-Consultants	= \$ 15,268.00
7 Premium Labor (Sum of Survey, Prel., R.O.W., & Const. Premium Labor)	=
8 <b>Total Project</b> (Total 5 + 6 + 7)	= \$ <b>159,003.19</b>

Estimated Existing Budget After Requested Revisions Completed: \$ (6,000.00)

Total Supplement Request: \$ **153,003.19**



AECOM  
220 Athens Way  
Suite 200  
Nashville, TN 37228  
www.aecom.com

615 244 8864 tel  
615 244 8760 fax

March 5, 2011

Project: 60092781  
File: 103.2

Mr. Kevin Comstock  
Project Manager  
City of Franklin  
109 Third Avenue South, Suite 142  
Franklin, TN 37064

**Subject: Request for Supplement #2 (Update)  
Project # TOC 08-02, Traffic Operations Center (TOC)  
Phase 3 Infrastructure and Upgrades**

Dear Mr. Comstock:

Per your request after your review of the January 18<sup>th</sup> CEI Supplement request, and based on the comments received via teleconference February 18<sup>th</sup>, AECOM has revised the request for a supplement to the above referenced project based on the following direction:

- No detailed oversight for the M.I.T. portion of the project including Ethernet switch setup and communication testing provided by AECOM.
- M.I.T. will provide IP address information for the contractor to input in the new signal controllers. The City will download the timing plan into the new controller.
- Testing of field devices will be assumed to be consolidated into the least number possible.
- Daily field inspection is set at an average of 3 hours per day.

As outlined in the January 18<sup>th</sup> letter, the attached cost proposal was updated to reflect the current labor rates for the personnel involved in the project. A lump sum item was added to the direct costs table for KS Ware to provide densities or geotechnical services, if needed.

The additional work covered in this supplement is included at the request of TDOT as part of the construction inspection services for this locally managed project. The outline below details each task that is included in the attached cost proposal. Following the outline is a detailed description of the inspection services that AECOM will provide on the network portion of the project.

**Outline of Supplement Items:**

1. Inspection of the network portion of the project
  - a. Review test procedures provided by the contractor
  - b. Stand Alone Tests
    - i. CCTV (Contractor will conduct this test – Part of Project Manual)
    - ii. Traffic Signal Controllers
    - iii. Conflict Monitors
    - iv. Uninterrupted Power Supplies
    - v. Terminal Servers
    - vi. ~~Field Ethernet Switches~~
  - c. Network Sub-System Test
    - i. CCTV
    - ii. Traffic Signal Controllers
    - iii. Conflict Monitors
    - iv. Uninterrupted Power Supplies

- v. Terminal Servers
  - ~~vi. Field Ethernet Switches~~
  - d. Network System Wide Test (30 consecutive days)
    - i. CCTV
    - ii. Traffic Signal Controllers
    - iii. Conflict Monitors
    - iv. Uninterrupted Power Supplies
    - v. Terminal Servers
    - ~~vi. Field Ethernet Switches~~
  - e. Compile Test Results
  - f. Re-test of any failed equipment
  - g. Final System Acceptance (completion of 30 day test)
2. TDOT and Project Specific CEI Requirements
- a. Pre-Construction Meeting
  - b. Review of Contract / subcontract documents as needed
  - c. Daily diaries by the CEI Consultant – on job at least once a day, includes employee interviews for DBE compliance and weekly payroll reviews
  - d. Review/Approve shop drawings and submittals
  - e. Bi-weekly progress meetings with City and TDOT FHWA representatives
  - f. Material Testing per TDOT Standard Operating Procedures
    - i. Concrete Aggregates – coarse and fine aggregate verification tests
    - ii. Concrete Cement – Sample at beginning of project and once per month
    - iii. Concrete Mixture – Daily concrete report while pouring
    - iv. Guardrail – Verify TDOT has current Brand Registration and Guarantee on file; Attenuator must be from QPL; Guardrail will require a completed T-2. Guarantee letters, certification of compliance, galvanizing letter, report of chemical analysis and test, hardware letter, report for wire cable, 3M letter, certification for reflective sheeting, FHWA letter, and shop drawings are also required.
    - v. Earth Pad for Guardrail – Borrow pit sample, embankment densities
    - vi. Sodding – Dept. of Agriculture authorization to remove the sod from the nursery
    - vii. Silt Fence – Accepted by CEI based on T-2 material certification by contractor
    - viii. Polyethelene Sheeting – Accepted by CEI based on T-2 material certification by contractor
    - ix. Traffic Control Items – Accepted by CEI based on T-2 material certification by contractor
    - x. Electrical Items (714 Items) – Based on submittal approvals prior to contractor procuring components. Accepted by CEI based on T-2 material certification by contractor.
    - xi. CCTV Poles – Shop drawings and calculations approved by TDOT Structures.
    - xii. CCTV Foundations – Reinforcing steel requires verification samples, and a T-2 with certifications; sample fresh concrete, cast cylinders, (plant inspection, stockpile sampling not required if contractor uses a plant already providing materials on a TDOT project)
    - xiii. ITS Components – Based on submittal approvals prior to contractor procuring components. Contractor to submit certificate of compliance and certifications with a T-2 form. Include approval letter from owner stating acceptance of completed system.



- g. Fiber Optic Testing – Review contractors submitted test procedure and inspect/monitor on-site installation and testing of fiber optic infrastructure. Review and approval final OTDR test results.
- h. Field measurement of installed quantities
- i. Submit lane closure requests TDOT on behalf of contractor for SR96 and SR397
- j. Monthly progress payment processing, includes prompt payment reviews
- k. Coordination with railroad/utilities/contractor as needed
- l. RFI's
- m. Change Order reviews
- n. As-Built drawing review
- o. Final inspection, punch list, acceptance
- p. Burn-in

#### **Network Testing Description:**

The following items are the network equipment that requires inspection and testing:

1. All field terminal servers
2. All field UPS's
3. All signal controllers
4. Manufacture software testing/diagnostics to field device

An overall test plan and test procedures are required to be developed to understand the amount of effort and expected results for the project testing criteria.

It is preferred and recommended to test every network device end-to-end, utilizing manufactures software to verify full functionality and operations of the network.

The testing level parameters are in the following sequence.

1. Stand Alone Test (SAT)
2. Network Sub-System Test (NSST)
3. System Wide Test (NSWT)

**Stand Alone Test (SAT):** After network equipment and fiber optic cable is installed, the inspections team shall conduct the SAT's with the COF representative. At a minimum, the SATs shall exercise all the non-network functional requirements of the equipment being installed and demonstrate compliance with the Plans and these Special Provisions. The COF shall furnish all necessary test equipment for testing of the network equipment.

**Network Sub-System Test (NSST):** The inspection team shall test the communications and limited functionality to and from the local field network switch to and from each of the associated field devices (i.e. CCTV, Traffic Signal Controller (TSC) conflict monitor and UPS).

The intent of the NSST is to fully test the communications and connections of a local field network switch, communications equipment and associated field devices and to test limited functionality. Local field functionality shall be tested to ensure that network protocols and communications are being sent to the appropriate component attached to a field network switch.

For example, the Inspection team sends a command via a laptop connected to the local field network switch then the data traffic is routed to a CCTV controller that moves the CCTV at the cabinet level.



**Network System Wide Test (NSWT):** After all, of the network, equipment has been installed in accordance with the requirements of the Special Provisions and the Plans, and each subsystem has successfully passed the (NSST): the inspection team shall perform a System wide Test for each communications device, CCTV, TSC and associated network device.

The System Test shall incorporate all components of the Network and shall fully exercise all ITS system functions using actual field data from installed ITS equipment for 30 consecutive days. The System Test shall be conducted using the manufactures supplied software from the TOC.

The test software shall send and receive all network protocol to all field devices. This shall include the daily polling sequence to each device to determine proper operations. Each field device shall be communicated with at the same interval as required for normal operation of the system.

If the Engineer / ITS specialist determine communications quality to be acceptable to all ITS devices, over the 30 days, the Inspection team shall deem the testing complete.

Testing Level Documentation - Throughout the testing levels, test documentation shall be developed and utilized to document testing procedures and outcome of testing performance.

Thank you in advance for consideration in this matter. Please do not hesitate to contact me at (615) 313-0355 office or (615) 812-9678 mobile with any questions that you may have or if you require additional information.

Sincerely,  
**AECOM**

Brian Hall, PE, CPESC  
Project Manager

Enclosure

cc: File – 60092781.103.2