April 14, 2011

Ms. Robin Hobbs, *HAAM 30-C*
Phone: (202) 366-4004
U.S. Department of Transportation
Federal Highway Administration
Office of Acquisition Management
Mail Stop: E65-101
Washington, DC 20590

Ms. Debbie Walker, HRDI-13
Federal Highway Administration
Pavement Performance Division
6300 Georgetown Pike
McLean, VA 22101

Reference: **Quarterly Progress Report for**

ARA LTPP Contract Weigh-In-Motion Calibrations and Validations

FHWA Contract No. DTFH61-10-D-00019

Dear Ms. Hobbs and Ms. Walker:

Enclosed please find one copy of our Quarterly Progress Report (QPR) for the quarter ending March 31, 2011.

If you have any questions or need additional information, please do not hesitate to contact us.

Sincerely,

Applied Research Associates, Inc.

Olga I. Selezneva, Ph.D.

Project Manager

enclosure

cc: Robin Gates

QUARTERLY PROGRESS REPORT - QUARTER ENDING MARCH, 2011

Contract Title:	Weigh-In-Motion Calibrations and Validations
Contract Number:	DTFH61-10-D-00019
Contract Project Manager:	Olga I. Selezneva, Ph.D.

Contract Summary

Contract Start Date:	April 28, 2010
Contract Completion Date:	April 27, 2011 (revised date: June 1, 2011, as per contract Modification 00001 dated February 2, 2011)
Contracting Officer (CO):	Robin Hobbs, HAAM 20-B, Phone: (202) 366-4004
CO's Technical Representative:	Debbie Walker, HRDI-13, Phone: (202)-493-3068

Summary of Work Performed Last Quarter

Task Order No. DTFH61-10-D-00019-T-10001

Requisition/Reference No. 41-13-10024

Start date: June 21, 2010

Completion date: November 20, 2010 (revised, as per contract Mod 00001 for this Task Order dated June 15, 2010)

All work under this task order has been completed. *WIM System Field Calibration and Validation Summary Reports* for all the sites included in this Task Order have been submitted to COTR and accepted upon COTR review.

No new work under this Task Order is planned for the next quarter.

Task Order No. DTFH61-10-D-00019-T-10002

Requisition/Reference No. 41-13-10044

Start date: September 21, 2010

Completion date: May 2, 2011 (revised, as per contract Mod 00001 for this Task Order dated February 2, 2011)

CLIN 0001A – Conduct WIM System Field Calibrations and Validations (LTPP Lane Only) for the following sites:

1. Arkansas, SPS-2 (050200)
2. Illinois, SPS-6 (170600)
3. Kansas, SPS-2 (200200)
4. Maine, SPS-5, (230500)
5. New Mexico, SPS-1 (350100)
6. New Mexico, SPS-5 (350500)
7. Tennessee, SPS-6 (470600)
8. Texas, SPS-1 (480100)

CLIN 0001B – Conduct WIM System Field Calibrations and Validations (Additional WIM Lane) for the following sites:

1. Texas, SPS-1 (480100)

Accomplishments

During this quarter, CLIN 0001A validations were conducted at the following sites:

1. New Mexico, SPS-1 (350100)
2. New Mexico, SPS-5 (350500)
3. Texas, SPS-1 (480100)
4. Arkansas, SPS-2 (050200)
5. Tennessee, SPS-6 (470600)

CLIN 0001B validations were conducted at the following sites:

1. Texas, SPS-1 (480100)

Important Findings

For the Texas SPS-1 site, truck type had statistically significant effect on GVW and steering axle weight errors.

For the New Mexico SPS-1 site, truck type had statistically significant effect on measurement errors of the GVW, steering axle weight, and the tandem axle trailer.

For the New Mexico SPS-5 site, temperature had statistically significant effect on the measurement error of steering axle weights and truck type had statistically significant effect on the measurement errors of GVW, steering axle weight, and the weight of tandem axles on trailers.

At the Arkansas SPS-2 site, speed had statistically significant effect on measurement errors of GVW, steering axles, and tandem axles. Discernable truck bouncing in the area of the WIM scales may have contributed to these significant speed trends.

For the Tennessee SPS-6 site, truck type affected steering axle and the tandem axle on tractor weight errors.

Summary of Recommended Corrective Actions

A summary of the equipment deficiencies that were noted during the validations visits conducted under Task Order 2 and their resolution status – recommended, pending resolution by FHWA or state highway agency, or completed is provided in Table 1.

Table 1 – Summary of Recommended Corrective Actions – TO2

Site ID	Recommended Action	Status
230500	It is recommended that the problems associated with the inconsistent weight measurements of tandem and tridem axle group weights and the failure of the equipment to detect inputs from the #2 WIM sensor be further investigated to determine if the problem is with the controller or with the sensor.	P
480100	During the on-site pavement evaluation, cracking in the pavement across both lanes in the LTPP direction and within the WIM Scale area was noted. It is recommended that these cracks be investigated to ensure that they do not present a potential problem for the operation of the WIM system.	R
350500	It is recommended that the right section of the trailing sensor be investigated to determine the reason for the sensor providing low front axle weights when trucks traversed that section of the sensor.	R
050200	The adverse truck dynamics within the WIM scale should be further investigated to ensure that the WIM installation is not the contributing catalyst. It should be verified through close inspection of the WIM scales that they are level with the pavement surface and not protruding above the pavement at the leading or trailing edges.	R

Status: R = recommended; P = pending resolution by FHWA or state highway agencies; C = completed; N = none.

It is unknown whether any corrective measures for the issues reported have been taken to date.

Future Activities

All planned activities under this Task Order have been completed during this quarter. No new work under this Task Order is planned for the next quarter.

Adjustments to the Project Schedule or Milestones

Based on Contract Modification dated 2/2/11, the revised completion date of Task Order 2 is May 2, 2011.

Task Order No. DTFH61-10-D-00019-T-10003

Requisition/Reference No. 41-13-10045

Start date: September 22, 2010

Completion date: June 1, 2011(as per contract Mod 00001 dated February 2, 2011)

CLIN 0001A – Conduct WIM System Field Calibrations and Validations (LTPP Lane Only) for the following sites:

1. Colorado, SPS-2 (080200)
2. Indiana, SPS-6 (180600)
3. Michigan, SPS-1 (260100)
4. Minnesota, SPS-5 (270500)
5. Pennsylvania, SPS-6 (420600)
6. Virginia, SPS-1 (510100)
7. Washington, SPS-2 (530200)
8. Wisconsin, SPS-1 (550100)

CLIN 0001B – Conduct WIM System Field Calibrations and Validations (Additional WIM Lane) for the following sites:

1. Virginia, SPS-1 (510100)

Accomplishments

During this quarter, CLIN 0001A validations were conducted at the following sites:

1. Colorado, SPS-2 (080200)
2. Virginia, SPS-1 (510100)

The Washington SPS-2 Validation was completed prior to end of this quarter; however, the report has not been submitted. Findings from this visit will be reported under the subsequent Quarterly Report.

A CLIN 0001B validation was attempted at the Texas, SPS-1 (480100) but was unsuccessful due to equipment deficiencies. The loop sensors were not operating properly and consequently not collecting and reporting the test truck data correctly.

Important Findings

For the Virginia SPS-1 site, speed had statistically significant effect on measurement errors of steering and tandem axles.

Summary of Recommended Corrective Actions

A summary of the equipment deficiencies that were noted during the validations visits conducted under Task Order 3 and their resolution status – recommended, pending resolution by FHWA or state highway agency, or completed is provided in Table 2.

Table 2 – Summary of Recommended Corrective Actions – TO3

Site ID	Recommended Action	Status
510100	It is recommended that the problems associated with the loop sensors in the additional lane be addressed to ensure that tractor-trailer trucks are captured properly.	C

Status: R = recommended; P = pending resolution by FHWA, state highway agency; C = completed; N = none.

It has been reported that the Phase II contractor has installed firmware that supports adjustments to the sensitivity and frequency settings of the inductive loops and has performed and tested these adjustments to their satisfaction.

Future Activities

Validation visits to the remaining sites contained in Task Order 10003 have been scheduled as follows:

1. Washington, SPS-2 (530200) – March 29, 2011
2. Wisconsin, SPS-1 (550100) – April 12, 2011
3. Minnesota, SPS-5 (270500) – April 26, 2011
4. Michigan, SPS-1 (260100) – May 10, 2011
5. Virginia, SPS-1 (510100) – Additional Lane (revisit) – May

Adjustments to the Project Schedule or Milestones

Based on Contract Modification dated 2/2/11, the revised completion date of Task Order 3 is June 1, 2011.

The completion of Task Order 3 on June 1, 2011 denotes the completion of contract year 1. ARA will be submitting an Annual Report on or before June 30, 2011.

CHANGES TO FIELD PROCEDURES

Beginning with the Colorado SPS-2 Validation, ARA has incorporated an automated imbalance adjustment into the field validation process. The Phase II contractor, based on an analysis of Class 9 front axle weights from a qualified two-week data sample, provides average front axle wheel weights which are incorporated into the WIMCal compensation factor adjustment recommendations.

MASTER SCHEDULE APPENDIX

A SharePoint web site has been developed to house Master schedule information. The following is the link to the SharePoint web site:

https://sharepoint.ara.com/MWD/it LTPP_SPSWIM

Username: spswim

Password: 986TzUbm