

WIM System Field Calibration and Validation Handout Guide

Ohio, SPS-1/2

SHRP ID – 390100/200

Validation Date: December 13, 2011



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1 Site Information

Site ID:	390100/390200	State:	Ohio
LTPP Region:	North Central	Configuration:	Loop – 2 Load Cells
Controller Type:	Mettler-Toledo	Sensor Type:	Load Cells
Power:	AC	Communication:	Landline
Class Scheme:	OHDOT	CPU type/setup:	

2 Contact Information

Agency	Contact	Position	Phone	E-Mail
FHWA	Debbie Walker	COTR	202 493-3068	deborah.walker@dot.gov
FHWA	Joe Glinksi	Division Office	614-280-6844	joseph.glinksi@dot.gov
RSC	Frank Meyer	Project Manager	716-632-0804	fmeyer@stantec.com
OH DOT	Roger Green	State Coordinator	614-995-5993	roger.green@dot.state.oh.us
OH DOT	Lindsay Pflum	Traffic contact	614-752-4057	lindsey.pflum@dot.state.oh.us
ARA	Dean Wolf	Task Leader	717-512-6638	dwolf@ara.com
ARA	Olga Selezneva	Project Manager	410-540-9949	oselezneva@ara.com

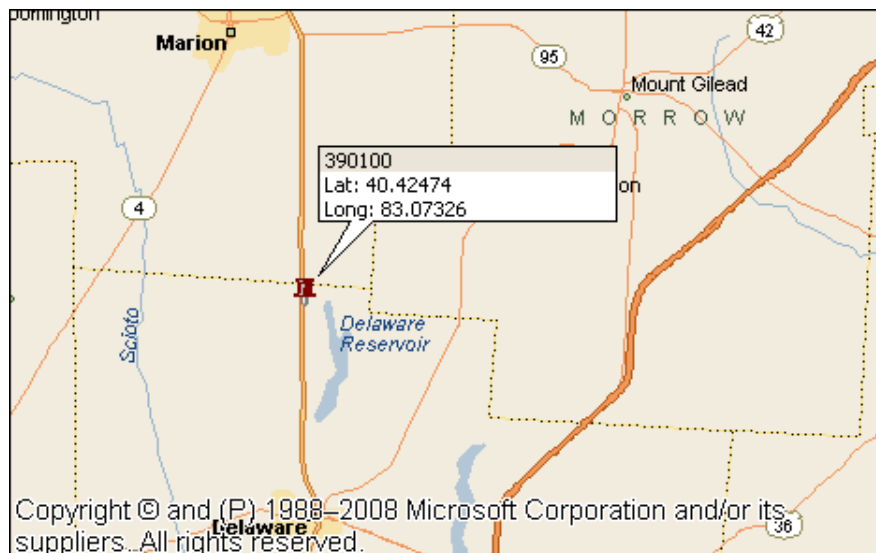
3 Schedule of Events

Date	Event	Location	Start Time
12/12/11	Travel	Marion, OH	TBD
12/13/11	Test Truck Weigh/Measure/Inspection	CAT Scale	7:00 am
12/13/11	Equipment Assessment	WIM Site	8:00 am
12/13/11	Initial Performance Evaluation	WIM Site	8:30 am
12/13/11	System Test/Class and Speed Study	WIM Site	TBD
12/14/11	Test Truck Weigh	CAT Scale	7:00 am
12/14/11	Calibration/Validation (if required)	WIM Site	8:00 am
12/14/11	Travel	Camp Hill, PA	TBD

4 Maps

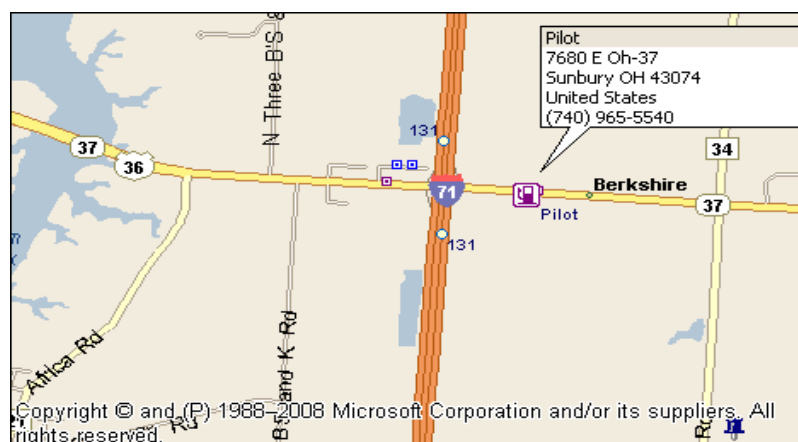
4.1 Site Location

Location:	US-23 at M.P. 19.7		Dir:	NB/SB
Latitude:	40.43188°	Longitude:	-83.07480°	



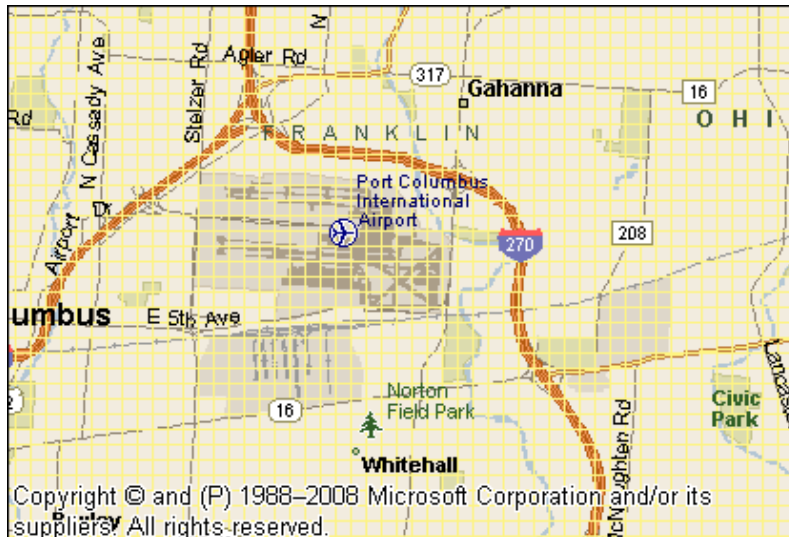
4.2 Truck Scale Location

Name:	CAT scale Pilot Travel	Location:	I-71 exit 131
Latitude:	40.26551	Longitude:	-82.92564



4.3 Airport Location

Name:	Port Columbus International	Location:	Wonderland, Ohio
Latitude:	39.995	Longitude:	-82.878



4.4 Hospital Location

Name:	Grady Memorial hospital		
Phone:	(740) 615-1000	Location:	561 W. Central Ave. Delaware, Ohio



5 Occupational Health and Safety Plan

All fieldwork in the right-of-way will be carried out when the ground visibility is more than 3 km, and when there is no accumulation of water, snow, or ice is on the pavement.

To the extent possible, inspection work during extremely high and low temperatures will be avoided. If the work becomes necessary, workers will be reminded to make appropriate precautions (wear protective clothing, drink fluids, and avoid prolonged exposure to severe weather conditions).

All personnel present on the right-of-way will wear approved safety gear (boots, reflective safety vest, and helmet).

The following items will be available at the site: a standard first-aid kit, a cell phone, and the location of nearby hospital(s).

6 Contingency Plan

If inclement weather is forecasted prior to mobilizing to the site, the Project Manager will make the final decision to postpone the Validation visit. The Task Leader is responsible for contacting all parties involved to inform them of the postponement. He is also responsible for rearranging travel.

Once the Validation team is on-site, the On-Site Task Leader is responsible for making decisions to delay or postpone the Validation. He will contact the Project Manager to make recommendations for completing the Validation, and the Project Manager will make the final decision to cancel or postpone. The On-Site Task Leader is responsible for contacting the COTR and all other participating parties to inform them of the delay or postponement.

Traffic Sheet 17 LTPP MONITORED TRAFFIC DATA WIM SITE INVENTORY	STATE CODE:	39
	SPS WIM ID:	390200
	DATE (mm/dd/yyyy)	12/13/2011

10. CABINET LOCATION

Same side of road as LTPP lane: Y
 Distance from edge of traveled lane: 25 ft
 distance from system: 95 ft
 type: 3B

Cabinet access controlled by: Agency
 Contact name: Lindsey Pflum Phone # 614-752-4057
 Alternate name: Dave Gardner Phone # 614-752-5740

11. POWER

Distance to cabinet from drop: 10 ft
 Type: AC
 AC in cabinet? Y
 Service provider: Amer. Elec. Power Phone # _____

12. TELEPHONE

Distance to cabinet from drop: 650 ft
 Type: landline
 Service provider: Verizon Phone # _____

13. SYSTEM

Software and version no. _____
 Computer connection: RS-232

14. TEST TRUCK TURNAROUND TIME

Duration: 12 minutes Distance: 6.2 miles

15. PHOTOS

Filename

Power source: 390100_power_service_box_12_13_11.jpg
 Phone source: 390100_telephone_pedestal_12_13_11.jpg
 Cabinet exterior: 390100_cabinet_exterior_12_13_11.jpg
 Cabinet interior: 390100_cabinet_interior_top_12_13_11.jpg
 Weight sensors: 390100_leading_WIM_sensor_12_13_11.jpg
 390100_trailing_WIM_sensor_12_13_11.jpg
 Other sensors: 390100_leading_loop_sensor_12_13_11.jpg

 Downstream from sensors on LTPP lane: 390100_downstream_12_13_11.jpg
 Upstream from sensors on LTPP lane: 390100_upstream_12_13_11.jpg

Traffic Sheet 18 LTPP MONITORED TRAFFIC DATA WIM SITE COORDINATION	STATE CODE: 39 SPS WIM ID: 390200 DATE (mm/dd/yyyy) 12/13/2011
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1. DATA PROCESSING

- a. Download: State only
- b. Data review: State per LTPP guidelines
If state, how often? Weekly
- c. Data submission LTPP
If state how often?

2. EQUIPMENT

- a. Purchase State
- b. Installation Included with purchase
- c. Maintenance Separate contract State
Expiration Date
- d. Calibration LTPP
- e. Manuals and software control: State
- f. Power
i. Type Underground ii. Payment State
- g. Communication
i. Type Landline ii. Payment State

3. PAVEMENT

- a. Type Portland Concrete Cement
- b. Allowable Rehabilitation activities Grinding and maintenance as needed
- c. Profile Site Markings Temporary

Traffic Sheet 18 LTPP MONITORED TRAFFIC DATA WIM SITE COORDINATION	STATE CODE: 39 SPS WIM ID: 390200 DATE (mm/dd/yyyy) 12/13/2011
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5. SITE SPECIFIC CONDITIONS

- a. Funds and accountability: _____
- b. Reports: _____
- c. Other: _____
- c. Special Conditions _____

6. CONTACTS

- a. Equipment (operational status, access, etc.)
Name Lindsey Pflum Phone # 614-752-4057
Agency Ohio DOT
- b. Maintenance (equipment)
Name Lindsey Pflum Phone # 614-752-4057
Agency Ohio DOT
- c. Data Processing and pre-visit data
Name Lindsey Pflum Phone # 614-752-4057
Agency Ohio DOT
- d. Construction schedule and verification
Name _____ Phone # _____
Agency _____
- e. Test Vehicles (trucks, loads, drivers)
Name John Smith Phone # 614-866-1809
Agency Eastland Towing
- f. Traffic control
Name _____ Phone # _____
Agency _____
- g. Enforcement coordination
Name _____ Phone # _____
Agency _____
- h. Nearest static scale
Name CAT Scale Location: I-71 exit 131
Phone: _____

Traffic Sheet 19 LTPP MONITORED TRAFFIC DATA CALIBRATION TEST TRUCK # 1	STATE CODE: 39 SPS WIM ID: 390200 DATE (mm/dd/yyyy) 12/13/2011
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CALIBRATION TEST TRUCK - Primary

PART A

1. FHWA CLASS: 9 2. Number of axles: 5
3. AXLE WEIGHTS (lbs)

	a. Empty Truck Avg. Axle Weight	b. Pre-test Average Axle Weight	c. Post-Test Avg. Axle Weight	d. Direct or Calculated?
A		11110	10880	Direct
B		16610	16520	Direct
C		16610	16520	Direct
D		16590	16580	Direct
E		16590	16580	Direct
F				

4. GVW (same units as axles)

- a. Empty GVW: _____
- b. Average Pre-Test Loaded weight: 77510
- c. Post Test Loaded Weight: 77080
- d. Difference Post Test - Pre-Tests: 430

5. TRUCK DESCRIPTION

- a. Tractor Cab Style: Conventional Sleeper Cab: No
photo: ☒

- b. Make: Kenworth
c. Model: _____

d. Trailer Load Distribution Description:

forklifts and crane weights

photo: ☒

- e. Tractor Tare weight - _____ - _____
- f. Trailer Tare weight - _____ - _____
- g. Axle Spacing - (feet and tenths)

A to B 13.6 B to C 4.3 C to D 37.4 D to E 4.1 E to F _____

- h. Wheelbase - ☐ Measured _____ ☒ Computed 59.4
- i. Kingpin offset from Axle B (units) -1.5" photo: ☐
- j. Overall Length - ☒ Measured 70.6

Traffic Sheet 19 LTPP MONITORED TRAFFIC DATA CALIBRATION TEST TRUCK # <u>1</u>	STATE CODE: 39 SPS WIM ID: 390200 DATE (mm/dd/yyyy) 12/13/2011
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CALIBRATION TEST TRUCK - Primary

6. SUSPENSION

	a. Tire size	b.Suspension description (leaf, air # of leaves, taper or flat leaf, etc.)	c. photo
A	11R24.5	steel spring	☒
B	11R24.5	air	☒
C	11R24.5	air	☒
D	10R17.5	air	☒
E	10R17.5	air	☒
F			☐

d. Cold Tire Pressures (psi)- from right to left

Steering Axle	Axle B	Axle C	Axle D	Axle E	Axle F

PART B

Table 1 - Raw Measurements -Platform Scale

Axes	Meas.	Pre-test Weight	Instance	Instance	Post-test weight
A	I				
A+B	II				
A+B+C	III				
A+B+C+D	IV				
A+B+C+D+E(1)	V				
A+B+C+D+E+(F)(1)	VI				
B+C+D+E+(F)	VII				
C+D+E+(F)	VIII				
D+E+(F)	IX				
E+(F)	X				
(F)	XI				
A+B+C+D+E+(F)(2)	XII				

Traffic Sheet 19 LTPP MONITORED TRAFFIC DATA CALIBRATION TEST TRUCK # <u>1</u>	STATE CODE: 39 SPS WIM ID: 390200 DATE (mm/dd/yyyy) 12/13/2011
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CALIBRATION TEST TRUCK - Primary

Table 2 - Axle and GVW Computations -Platform Scale Pre-test

	1		2		Avg.
Axle A	I	0	VI-VII	0	0
Axle B	II-I	0	VII-VIII	0	0
Axle C	III-II	0	VIII-IX	0	0
Axle D	IV-III	0	IX-X	0	0
Axle E	V-IV	0	X-XI	0	0
Axle F	VI-V		XI		
GVW	VI	0	XII	0	0

Table 3- Axle and GVW Computations - Platform Scale - Instance -

	1		2		Avg.
Axle A	I	0	VI-VII	0	0
Axle B	II-I	0	VII-VIII	0	0
Axle C	III-II	0	VIII-IX	0	0
Axle D	IV-III	0	IX-X	0	0
Axle E	V-IV	0	X-XI	0	0
Axle F	VI-V		XI		
GVW	VI	0	XII	0	0

Table 4- Axle and GVW Computations - Platform Scale - Instance -

	1		2		Avg.
Axle A	I	0	VI-VII	0	0
Axle B	II-I	0	VII-VIII	0	0
Axle C	III-II	0	VIII-IX	0	0
Axle D	IV-III	0	IX-X	0	0
Axle E	V-IV	0	X-XI	0	0
Axle F	VI-V		XI		
GVW	VI	0	XII	0	0

Table 5- Axle and GVW Computations - Platform Scale Post-Test

	1		2		Avg.
Axle A	I	0	VI-VII	0	0
Axle B	II-I	0	VII-VIII	0	0
Axle C	III-II	0	VIII-IX	0	0
Axle D	IV-III	0	IX-X	0	0
Axle E	V-IV	0	X-XI	0	0
Axle F	VI-V		XI		
GVW	VI	0	XII	0	0

Traffic Sheet 19 LTPP MONITORED TRAFFIC DATA CALIBRATION TEST TRUCK # <u>1</u>	STATE CODE: 39 SPS WIM ID: 390200 DATE (mm/dd/yyyy) 12/13/2011
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CALIBRATION TEST TRUCK - Primary

Table 6 - Raw Data -Axle Scales - Pre-test

Pass	Axle A	Axle B	Axle C	Axle D	Axle E	Axle F	GVW
1	11100	16620	16620	16590	16590		77520
2	11120	16600	16600	16590	16590		77500
Avg.	11110	16610	16610	16590	16590		77510

Table 7- Raw Data- Axle scales -

Pass	Axle A	Axle B	Axle C	Axle D	Axle E	Axle F	GVW
Avg.							

Table 8- Raw Data- Axle scales -

Pass	Axle A	Axle B	Axle C	Axle D	Axle E	Axle F	GVW
Avg.							

Table 9 - Raw Data -Axle Scales - Post-test

Pass	Axle A	Axle B	Axle C	Axle D	Axle E	Axle F	GVW
1	10900	16510	16510	16580	16580		77080
2	10860	16530	16530	16580	16580		77080
Avg.	10880	16520	16520	16580	16580		77080

Validation Test Truck Run Set - Pre

Measured By: Dean J. Wolf

Verified By: AR

Traffic Sheet 19 LTPP MONITORED TRAFFIC DATA CALIBRATION TEST TRUCK # 2	STATE CODE: 39 SPS WIM ID: 390200 DATE (mm/dd/yyyy) 12/13/2011
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CALIBRATION TEST TRUCK - Secondary

PART A

1. FHWA CLASS: 9 2. Number of axles: 5
3. AXLE WEIGHTS (lbs)

	a. Empty Truck Avg. Axle Weight	b. Pre-test Average Axle Weight	c. Post-Test Avg. Axle Weight	d. Direct or Calculated?
A		9950	9700	Direct
B		11810	11750	Direct
C		11810	11750	Direct
D		15640	15605	Direct
E		15640	15605	Direct
F				

4. GVW (same units as axles)

- a. Empty GVW: _____
- b. Average Pre-Test Loaded weight: 64850
- c. Post Test Loaded Weight: 64410
- d. Difference Post Test - Pre-Tests: 440

5. TRUCK DESCRIPTION

- a. Tractor Cab Style: Cab Over Engine Sleeper Cab: No
photo: ☒

- b. Make: Kenworth
- c. Model: _____

d. Trailer Load Distribution Description:

forklifts

photo: ☒

- e. Tractor Tare weight - _____ - _____
- f. Trailer Tare weight - _____ - _____
- g. Axle Spacing - (feet and tenths)

A to B 12.8 B to C 4.3 C to D 31.7 D to E 4.0 E to F _____

- h. Wheelbase - ☐ Measured _____ ☒ Computed 52.8
- i. Kingpin offset from Axle B (units) -2.4" photo: ☐
- j. Overall Length - ☒ Measured 63.1

Traffic Sheet 19 LTPP MONITORED TRAFFIC DATA CALIBRATION TEST TRUCK # <u>2</u>	STATE CODE: 39 SPS WIM ID: 390200 DATE (mm/dd/yyyy) 12/13/2011
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CALIBRATION TEST TRUCK - Secondary

6. SUSPENSION

	a. Tire size	b.Suspension description (leaf, air # of leaves, taper or flat leaf, etc.)	c. photo
A	11R24.5	steel spring	☒
B	11R24.5	air	☒
C	11R24.5	air	☒
D	10R17.5	air	☒
E	10R17.5	air	☒
F			☐

d. Cold Tire Pressures (psi)- from right to left

Steering Axle	Axle B	Axle C	Axle D	Axle E	Axle F

PART B

Table 1 - Raw Measurements -Platform Scale

Axes	Meas.	Pre-test Weight	Instance	Instance	Post-test weight
A	I				
A+B	II				
A+B+C	III				
A+B+C+D	IV				
A+B+C+D+E(1)	V				
A+B+C+D+E+(F)(1)	VI				
B+C+D+E+(F)	VII				
C+D+E+(F)	VIII				
D+E+(F)	IX				
E+(F)	X				
(F)	XI				
A+B+C+D+E+(F)(2)	XII				

Traffic Sheet 19 LTPP MONITORED TRAFFIC DATA CALIBRATION TEST TRUCK # 2	STATE CODE: 39 SPS WIM ID: 390200 DATE (mm/dd/yyyy) 12/13/2011
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CALIBRATION TEST TRUCK - Secondary

Table 2 - Axle and GVW Computations -Platform Scale Pre-test

	1		2		Avg.
Axle A	I	0	VI-VII	0	0
Axle B	II-I	0	VII-VIII	0	0
Axle C	III-II	0	VIII-IX	0	0
Axle D	IV-III	0	IX-X	0	0
Axle E	V-IV	0	X-XI	0	0
Axle F	VI-V		XI		
GVW	VI	0	XII	0	0

Table 3- Axle and GVW Computations - Platform Scale - Instance -

	1		2		Avg.
Axle A	I	0	VI-VII	0	0
Axle B	II-I	0	VII-VIII	0	0
Axle C	III-II	0	VIII-IX	0	0
Axle D	IV-III	0	IX-X	0	0
Axle E	V-IV	0	X-XI	0	0
Axle F	VI-V		XI		
GVW	VI	0	XII	0	0

Table 4- Axle and GVW Computations - Platform Scale - Instance -

	1		2		Avg.
Axle A	I	0	VI-VII	0	0
Axle B	II-I	0	VII-VIII	0	0
Axle C	III-II	0	VIII-IX	0	0
Axle D	IV-III	0	IX-X	0	0
Axle E	V-IV	0	X-XI	0	0
Axle F	VI-V		XI		
GVW	VI	0	XII	0	0

Table 5- Axle and GVW Computations - Platform Scale Post-Test

	1		2		Avg.
Axle A	I	0	VI-VII	0	0
Axle B	II-I	0	VII-VIII	0	0
Axle C	III-II	0	VIII-IX	0	0
Axle D	IV-III	0	IX-X	0	0
Axle E	V-IV	0	X-XI	0	0
Axle F	VI-V		XI		
GVW	VI	0	XII	0	0

Traffic Sheet 19 LTPP MONITORED TRAFFIC DATA CALIBRATION TEST TRUCK # 2	STATE CODE: 39 SPS WIM ID: 390200 DATE (mm/dd/yyyy) 12/13/2011
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CALIBRATION TEST TRUCK - Secondary

Table 6 - Raw Data -Axle Scales - Pre-test

Pass	Axle A	Axle B	Axle C	Axle D	Axle E	Axle F	GVW
1	9940	11820	11820	15640	15640		64860
2	9960	11800	11800	15640	15640		64840
Avg.	9950	11810	11810	15640	15640		64850

Table 7- Raw Data- Axle scales -

Pass	Axle A	Axle B	Axle C	Axle D	Axle E	Axle F	GVW
Avg.							

Table 8- Raw Data- Axle scales -

Pass	Axle A	Axle B	Axle C	Axle D	Axle E	Axle F	GVW
Avg.							

Table 9 - Raw Data -Axle Scales - Post-test

Pass	Axle A	Axle B	Axle C	Axle D	Axle E	Axle F	GVW
1	9760	11710	11710	15620	15620		64420
2	9640	11790	11790	15590	15590		64400
Avg.	9700	11750	11750	15605	15605		64410

Validation Test Truck Run Set - Pre

Measured By: Dean J. Wolf

Verified By: AR

Traffic Sheet 21 (Wheel Load) LTPP MONITORED TRAFFIC DATA WIM SYSTEM TRUCK RECORDS										STATE CODE: 39 SPS WIM ID: 390200 DATE: (mm/dd/yyyy): 12/13/2011									
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Pvmt Temp	Radar speed	Truck	Pass	Time	Record No.	WIM Speed	Axle A	Axle B	Axle C	Axle D	Axle E	Axle F	GVW	A-B space	B-C space	C-D space	D - E space	E - F space	Axle Length	Overall Length
25.7	45	2	1	9:09:46	5885	46.0	9.8	11.5	11.9	15.5	15.2		63.9	12.9	4.2	31.3	4.0		52.4	52.4
25.7	48	1	1	9:15:18	5994	48.0	10.1	17.1	16.7	17.0	16.6		77.5	13.5	4.3	37.3	4.0		59.1	59.1
26.6	51	1	2	9:31:40	6399	53.0	10.0	16.7	16.2	16.2	16.3		75.4	13.4	4.3	36.8	4.0		58.5	58.5
26.6	48	2	2	9:36:17	6492	48.0	9.4	11.8	12.0	15.5	15.3		64.0	12.9	4.1	31.3	4.0		52.3	52.3
29.7	55	2	3	9:52:04	6846	57.0	9.4	12.1	11.6	15.8	15.7		64.6	13.0	4.2	31.3	4.0		52.5	52.5
29.7	44	1	3	9:54:55	6895	42.0	10.6	16.2	15.3	16.7	15.9		77.7	13.4	4.2	36.7	4.0		58.3	58.3
31.8	45	2	4	10:07:45	7137	46.0	9.8	11.6	11.6	15.6	15.3		63.9	12.8	4.1	31.3	4.0		52.2	52.2
31.8	53	2	5	10:21:44	7413	52.0	9.6	11.8	11.7	15.4	15.1		63.6	12.9	4.2	31.1	4.0		52.2	52.2
35.8	53	1	4	10:26:22	7509	53.0	10.1	17.0	16.3	16.2	16.7		76.3	13.5	4.3	36.7	4.0		58.5	58.5
35.8	54	2	6	10:35:17	7686	55.0	9.6	12.3	12.0	15.5	15.5		64.9	12.8	4.2	30.8	4.0		51.8	51.8
34.8	45	1	5	10:41:34	7808	45.0	10.5	16.9	15.9	15.4	16.9		77.2	13.6	4.3	37.4	4.0		59.3	59.3
34.8	45	2	7	10:51:02	8006	46.0	9.9	11.7	11.8	15.7	15.4		64.5	12.9	4.1	31.4	4.0		52.4	52.4
34.9	50	1	6	10:56:18	8105	49.0	10.1	17.0	16.8	16.4	16.6		76.8	13.5	4.3	37.2	4.0		59.0	59.0
34.9	50	2	8	11:09:28	8320	52.0	9.4	11.8	11.6	15.7	15.1		63.6	13.1	4.2	31.1	4.0		52.4	52.4
35.2	55	2	9	11:23:02	8586	56.0	9.4	12.5	12.2	16.0	15.7		65.8	12.7	4.2	30.7	3.9		51.5	51.5
35.2	44	1	7	11:26:35	8656	43.0	10.5	16.0	15.6	17.1	16.7		75.9	13.4	4.2	36.9	3.9		58.4	58.4
36.2	45	2	10	11:36:45	8875	46.0	9.8	11.5	11.7	15.4	15.3		63.7	12.9	4.1	31.3	4.0		52.3	52.3
36.2	48	1	8	11:42:08	8984	47.0	10.0	17.2	16.7	17.0	17.1		78.0	13.3	4.3	37.0	4.0		58.6	58.6
38.1	51	2	11	11:53:09	9239	52.0	9.5	11.6	11.5	15.4	15.0		63.0	13.1	4.2	31.5	4.0		52.8	52.8
38.1	51	1	9	11:57:47	9310	53.0	9.9	17.2	16.5	16.1	16.3		75.9	13.5	4.3	37.1	4.0		58.9	58.9
36.1	55	2	12	12:06:40	9526	57.0	9.2	12.6	12.0	16.1	15.8		65.7	12.9	4.2	31.1	4.0		52.2	52.2
36.1	46	1	10	12:13:31	9673	47.0	10.4	17.4	16.9	17.1	17.0		78.8	13.3	4.3	37.1	4.0		58.7	58.7
36.6	42	1	11	1:10:59	10850	42.0	10.5	16.5	15.4	16.7	16.6		75.6	13.1	4.2	36.3	3.9		57.5	57.5
36.6	47	2	13	1:15:02	10912	46.0	9.9	11.5	11.9	15.7	15.1		64.1	13.0	4.2	31.6	4.0		52.8	52.8

Recorded By: <u> djw </u>	Verified By: <u> ar </u>	Run Set <u> Pre </u>
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Traffic Sheet 21 (Wheel Load) LTTP MONITORED TRAFFIC DATA WIM SYSTEM TRUCK RECORDS										STATE CODE: 39 SPS WIM ID: 390200 DATE: (mm/dd/yyyy): 12/13/2011									
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Pvmt Temp	Radar speed	Truck	Pass	Time	Record No.	WIM Speed	Axle A	Axle B	Axle C	Axle D	Axle E	Axle F	GVW	A-B space	B-C space	C-D space	D - E space	E - F space	Axle Length	Overall Length
37.6	49	1	12	1:26:12	11168	49.0	10.2	17.0	16.9	16.6	16.5		77.2	13.7	4.4	37.4	4.0		59.5	59.5
37.6	52	2	14	1:31:04	11295	52.0	9.3	11.6	11.9	15.6	15.0		63.4	13.1	4.2	31.1	4.0		52.4	52.4
37.7	50	1	13	1:42:12	11547	53.0	9.9	16.9	16.5	16.3	16.4		76.0	13.3	4.2	36.6	4.0		58.1	58.1
37.7	55	2	15	1:45:15	11610	56.0	9.4	12.3	11.6	16.0	15.9		65.2	12.9	4.2	31.4	4.0		52.5	52.5
38.0	44	1	14	1:58:13	11893	44.0	10.5	16.9	16.0	17.3	17.0		77.7	13.3	4.3	37.0	4.0		58.6	58.6
38.0	45	2	16	2:00:57	11958	46.0	9.9	11.8	12.0	15.4	15.3		64.4	13.1	4.2	32.0	4.0		53.3	53.3
39.5	49	1	15	2:13:12	12238	49.0	10.1	16.9	16.9	16.5	17.0		77.3	13.5	4.3	37.4	4.0		59.2	59.2
39.5	51	2	17	2:16:31	12325	52.0	9.4	11.7	11.7	15.5	15.0		63.3	12.9	4.2	31.0	4.0		52.1	52.1
38.3	55	2	18	2:32:12	12731	56.0	9.3	12.2	11.9	16.0	15.8		65.2	13.0	4.2	31.4	4.0		52.6	52.6
38.3	55	1	16	2:33:39	12766	52.0	10.0	17.0	16.6	15.7	16.3		75.6	13.2	4.3	36.6	4.0		58.1	58.1
38.6	45	1	17	2:35:00	12923	43.0	10.3	17.0	16.3	17.0	17.0		77.6	13.1	4.2	37.6	3.9		58.8	58.5
38.6	44	2	19	2:49:59	13151	45.0	9.9	11.4	11.8	15.4	15.0		63.5	13.0	4.2	31.4	3.9		52.5	52.5
38.0	54	1	18	3:03:30	13495	53.0	9.6	16.5	16.7	16.4	16.6		75.8	13.4	4.3	36.9	4.0		58.6	58.6
38.0	50	2	20	3:05:31	13545	50.0	9.4	11.4	11.5	15.5	15.0		62.8	12.9	4.2	31.6	4.0		52.7	52.7
37.5	50	1	19	3:19:34	13897	50.0	9.9	16.9	16.7	16.6	16.8		76.9	13.4	4.3	37.4	4.0		59.1	59.1
37.5	52	2	21	3:21:36	13950	54.0	9.4	11.8	11.2	15.4	15.1		62.9	12.7	4.1	30.7	4.0		51.5	51.5

Recorded By: <u> djw </u>	Verified By: <u> ar </u>	Run Set <u> Pre </u>
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Traffic Sheet 22 LTPP MONITORED TRAFFIC DATA SITE EQUIPMENT ASSESSMENT LTPP LANE ONLY	STATE CODE: 39 SPS WIM ID: 390200 STATE ASSIGNED ID 721 DATE (mm/dd/yyyy) 12/13/2011
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SITE EQUIPMENT INFORMATION

1. TYPE OF EQUIPMENT BOTH
2. LANE NUMBER ON SITE 1 3. DIRECTION ON SITE north
4. VENDOR Mettler MODEL SERIAL#
5. WEIGHING SENSOR TYPE load cell
6. SYSTEM SOFTWARE VERSIONS:
- CPU
- LOOP
- PIEZO
- WEIGHTPAD/ LOADCELL
- COMMUNICATIONS
7. CLASSIFICATION VIDEO:
- TIME FROM: TO:
- TIME FROM: TO:

SITE CONDITIONS

8. PAVEMENT:

Indicate any deficiencies that may affect the performance of the WIM system. List all photos on Sheet 24 that support the evaluation.

There were no pavement distresses noted that may affect the accuracies of the WIM system.

Traffic Sheet 22 LTPP MONITORED TRAFFIC DATA SITE EQUIPMENT ASSESSMENT LTPP LANE ONLY	STATE CODE: 39 SPS WIM ID: 390200 STATE ASSIGNED ID 721 DATE (mm/dd/yyyy) 12/13/2011
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9. IN ROAD SENSORS:

Describe any deficiencies regarding the sensor installation. Indicate sensors that show any signs of being broken, severely worn, missing, removed, or loose. List photos on Sheet 24 for

the equipment is operating within the manufacturer's tolerances.

TRUCK OBSERVATIONS

- 10.** Indicate any irregular truck behaviors such as bouncing, swerving, or braking near the weighing area (within 40 meters). Note the distance from the weighing sensors.

A visual observation of the trucks as they approach, traverse, and leave the sensor area did not indicate any adverse dynamics that would affect the accuracy of the WIM system. The trucks appear to track down the center of the lane.

Minimum 15 minute or 35 truck sample video sample for pavement interaction deficiencies:

Tape Filename: _____

Time: _____

From: _____

To: _____

Traffic Sheet 22 LTPP MONITORED TRAFFIC DATA SITE EQUIPMENT ASSESSMENT LTPP LANE ONLY	STATE CODE: 39 SPS WIM ID: 390200 STATE ASSIGNED ID 721 DATE (mm/dd/yyyy) 12/13/2011
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11. CLASSIFICATION VERIFICATION VIDEO:

TAPE 1- NAME: _____

Interval	Filename	From	To
1	_____	_____	_____
2	_____	_____	_____
3	_____	_____	_____
4	_____	_____	_____
5	_____	_____	_____
6	_____	_____	_____
7	_____	_____	_____
8	_____	_____	_____

TAPE 2- NAME: _____

Interval	Filename	From	To
1	_____	_____	_____
2	_____	_____	_____
3	_____	_____	_____
4	_____	_____	_____
5	_____	_____	_____
6	_____	_____	_____
7	_____	_____	_____
8	_____	_____	_____

TAPE 3- NAME: _____

Interval	Filename	From	To
1	_____	_____	_____
2	_____	_____	_____
3	_____	_____	_____
4	_____	_____	_____
5	_____	_____	_____
6	_____	_____	_____
7	_____	_____	_____
8	_____	_____	_____

Traffic Sheet 22 LTPP MONITORED TRAFFIC DATA SITE EQUIPMENT ASSESSMENT LTPP LANE ONLY	STATE CODE: 39 SPS WIM ID: 390200 STATE ASSIGNED ID 721 DATE (mm/dd/yyyy) 12/13/2011
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SYSTEM ACCURACY TESTS

12. CONDUCT THE FOLLOWING SYSTEM ACCURACY TESTS EITHER ON- SITE OR IN OFFICE

Speed Accuracy - Complete Sheet 20 and attach.

Average radar speed	<u>55.8</u> mph	Average WIM Speed	<u>55.3</u> mph
Mean Difference	<u>-0.5</u> mph	SD of mean	<u>3.2</u>

Posted Speed Limit	<u>55</u> mph		
Speed Range	15th percentile - <u>53</u> mph	85th percentile-	<u>60</u> mph

Spacing and Weight - Complete Sheet 21 and attach.

Average distance between axles of drive tandem		<u> </u> feet	
% error from 4.25 ft (industry average)	OR	<u>4.23</u> ft (WIM system average)	
= <u>-0.6</u> %			

Average front axle weight for Class 9 vehicles		<u> </u> lbs	
% error from 10.3 kips (industry average) OR		<u>9.8</u> lbs (known site value)	
= <u>-4.4</u> %			

SUPPORT EQUIPMENT STRUCTURES

17. Indicate any deficiencies with any site equipment other than the in-road sensors. List all photos on the Sheet 24 for each occurrence.

Cabinet/Foundation None ☒

no cabinet or foundation deficiencies

Pull Boxes None ☒

no pull box deficiencies

Mast None ☒

no service mast deficiencies

Solar Panels None ☒

no solar panel deficiencies

Traffic Sheet 22 LTPP MONITORED TRAFFIC DATA SITE EQUIPMENT ASSESSMENT LTPP LANE ONLY	STATE CODE: 39 SPS WIM ID: 390200 STATE ASSIGNED ID 721 DATE (mm/dd/yyyy) 12/13/2011
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Telephone D-Mark Box None ☒

no telephone d-mark box deficiencies

Power Service Box None ☒

no power service box deficiencies

Grounding None ☒

no grounding deficiencies

Conduit None ☒

no conduit deficiencies

STATIC AND DYNAMIC ELECTRONIC EQUIPMENT TESTS

18. Complete and attach a Sheet 22 addendum applicable to the installed road equipment.

ADDITIONAL COMMENTS

All values for the WIM sensors and inductive loops were within tolerances. Electronic tests of the power and communication devices indicated that they were operating normally.

Assessor _____ Dean J. Wolf

Traffic Sheet 23 LTPP MONITORED TRAFFIC DATA WIM Troubleshooting Outline	STATE CODE: 39 SPS WIM ID: 390200 DATE (mm/dd/yyyy) 12/13/2011
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STEP 1 - PROBLEM DESCRIPTION

PROVIDE A DETAILED DESCRIPTION OF THE PROBLEM.

The WIM system appeared to collect, analyze and report vehicle measurements normally. No troubleshooting actions were taken.

STEP 2 - COLLECT SYSTEM DATA

2A SYSTEM PARAMETERS

REVIEW ALL EQUIPMENT OPERATIONAL PARAMETERS SUCH AS CLASSIFICATION ALGORITHMS, DATE/TIME, WEIGHT AND SPEED/SPACING ERROR COMPENSATION FACTORS, AS WELL AS SENSOR LANE ASSIGNMENTS AND THRESHOLD SETTINGS

MAKE NOTE OF ANY SUSPECT VALUES. DO NOT CHANGE VALUES AT THIS TIME.

2B DOWNLOAD SYSTEM DATA

DOWNLOAD SYSTEM TRAFFIC DATA FOR THE DAY OR TIME PERIOD IN QUESTION. SITE PROBLEMS THAT CAN ONLY BE DETERMINED BY REVIEWING DATA FILES WILL MOST LIKELY REQUIRE A SECOND SITE VISIT UNLESS THE FILES CAN BE PROCESSED ONSITE

2C RECORD SYSTEM DIAGNOSTIC MODE VALUES

RECORD ALL SENSOR VALUES GIVEN IN THE SYSTEMS' DIAGNOSTIC MODE FOR THE LANE BEING INVESTIGATED, IF AVAILABLE. MAKE NOTE OF ANY DEFICIENCIES, AND SUSPECT OR INCONSISTANT VALUES.

Traffic Sheet 23 LTPP MONITORED TRAFFIC DATA WIM Troubleshooting Outline	STATE CODE: 39 SPS WIM ID: 390200 DATE (mm/dd/yyyy) 12/13/2011
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LOOP SENSORS:

LOOP	VALUE
LEAD	
TRAIL	

WEIGHPAD / LOAD CELL SENSORS:

SENSOR	VALUE
LEAD/ SENSOR 1	
LEAD/ SENSOR 2	
LEAD/ SENSOR 3	
TRAIL/ SENSOR 1	
TRAIL/ SENSOR 2	
TRAIL/ SENSOR 3	

PIEZO SENSORS:

PIEZO	VALUE
LEADING	
2nd	
3rd	
TRAILING	

KISTLER QUARTZ SENSORS:

SENSOR	VALUE
LEADING	
TRAILING	

TEMPERATURE SENSOR:

2D ANALYZE THE INFORMATION COLLECTED

Traffic Sheet 23	STATE CODE: 39
LTPP MONITORED TRAFFIC DATA	SPS WIM ID: 390200
WIM Troubleshooting Outline	DATE (mm/dd/yyyy) 12/13/2011

STEP 3 FINDING THE SOURCE OF THE PROBLEM

3A- PROBABLE FAULTY FUNCTION

LIST THE DEFICIENCIES DISCOVERED IN STEPS 1 & 2 BELOW. INDICATE THEIR ASSOCIATED WIM SYSTEM PRIMARY FUNCTIONS (POWER, COMMUNICATIONS, WEIGHT & CLASSIFICATION, ETC.).

SYMPTOM	FUNCTION

BASED ON THE SYMPTOMS LISTED ABOVE, MAKE A CONCLUSION AS TO THE MOST PROBABLE FAULTY SYSTEM FUNCTION. ADD ANY CLARIFYING NOTES.

MOST PROBABLE FAULTY FUNCTION: _____

3B- FAULTY COMPONENT

USE THE STANDARD EQUIPMENT MAINTENANCE FORM (SHEET 22 TO RECORD ALL SYSTEM COMPONENT STATIC AND DYNAMIC VALUES USING THE TEST POINTS INDICATED BELOW FOR THE THE SYSTEM FUNCTION IN QUESTION.

TP#	TEST POINT DESCRIPTION	SYSTEM FUNCTION	DESCREPANCY Y/N
1	WIM SYSTEM POWER INPUT	POWER	
2	DC MODEM INPUT	POWER/ COMMUNICATION	
3	TELCO SURGE SUPPRESSOR OUTPUT	COMMUNICATION	
4	TELCO TERMINAL STRIP OUTPUT	COMMUNICATION	
5	TELCO D-MARK BOX OUTPUT	COMMUNICATION	
6	SENSOR TERMINAL STRIP INPUTS	WEIGHT/CLASSIFICATION	
7	PULL BOX INPUTS	WEIGHT/CLASSIFICATION	
8	DC POWER TERMINAL STRIP OUTPUTS	POWER	
9	DC REGULATOR OUTPUT	POWER	
10	BATTERY OUTPUT	POWER	
11	SOLAR SURGE SUPPRESSOR OUTPUT	POWER	
12	SOLAR PANEL OUTPUT	POWER	
13	AC POWER TERMINAL STRIP	POWER	
14	AC SERVICE DROP OUTPUT	POWER	
15	AC CIRCUIT BREAKER OUTPUT	POWER	
16	AC OUTLET OUTPUT	POWER	
17	EXTERNAL POWER SUPPLY OUTPUT	POWER	

Traffic Sheet 23 LTPP MONITORED TRAFFIC DATA WIM Troubleshooting Outline	STATE CODE: 39 SPS WIM ID: 390200 DATE (mm/dd/yyyy) 12/13/2011
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DESCRIBE ANY SUSPECT TEST RESULTS.

BASED ON THE TEST READINGS MADE, DRAW A CONCLUSION AS TO THE MOST PROBABLE FAULTY COMPONENT AND INDICATE BELOW.

SUSPECTED FAULTY COMPONENT: _____

STEP- 4 DETERMINE THE CORRECTIVE ACTION

CONSIDERING ALL FACTORS ASSOCIATED WITH THE REPAIR OF THE FAULTY COMPONENT, DETERMINE THE CORRECTIVE ACTION.

DESCRIBE CORRECTIVE ACTION TAKEN.

STEP 5- REPAIRING THE SYSTEM

DESCRIBE THE ACTIONS TAKEN TO REPAIR THE SYSTEM, OR MAKE RECOMMENDATIONS ON THE REPAIRS THAT NEED TO BE TAKEN TO CORRECT THE SYSTEM DEFICIENCY.

ASSESSED BY: _____

Traffic Sheet 24A LTPP MONITORED TRAFFIC DATA SITE PHOTO LOG - Equipment	STATE CODE: 39 SPS WIM ID: 390200 DATE (mm/dd/yyyy) 12/13/2011
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Item	Description	Filename
1	Power Source	390100_power_service_box_12_13_11.jpg
2	Telephone Source	390100_telephone_pedestal_12_13_11.jpg
3	Cabinet Exterior	390100_cabinet_exterior_12_13_11.jpg
4	Cabinet Interior	390100_cabinet_interior_top_12_13_11.jpg
5	Leading weight sensor	390100_leading_WIM_sensor_12_13_11.jpg
6	Trailing weight sensor	390100_trailing_WIM_sensor_12_13_11.jpg
7	Leading classification sensor	
8	Trailing classification sensor	
9	Leading loop sensor	390100_leading_loop_sensor_12_13_11.jpg
10	Trailing loop sensor	
11	Downstream from site	390100_downstream_12_13_11.jpg
12	Upstream from site	390100_upstream_12_13_11.jpg
13	Cabinet Interior - Rear	390100_cabinet_interior_bottom_12_13_11.jpg
14		
15		
16		
17		
18		
19		
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26		
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28		
29		
30		

RECORDED BY: _____ Dean J. Wolf

Traffic Sheet 24B	STATE CODE: 39
LTPP MONITORED TRAFFIC DATA	SPS WIM ID: 390200
SITE PHOTO LOG - Test Trucks	DATE (mm/dd/yyyy) 12/13/2011

Item	Description	Filename
1	Tractor, Truck #1	390100_Truck_1_Tractor_12_13_11.jpg
2	Trailer/Load, Truck #1	390100_Truck_1_Trailer_12_13_11.jpg
3	Kingpin Offset, Truck #1	
4	Suspension A, Truck #1	390100_Truck_1_Suspension_1_12_13_11.jpg
5	Suspension B, Truck #1	390100_Truck_1_Suspension_2_12_13_11.jpg
6	Suspension C, Truck #1	390100_Truck_1_Suspension_3_12_13_11.jpg
7	Suspension D, Truck #1	390100_Truck_1_Suspension_4_12_13_11.jpg
8	Suspension E, Truck #1	390100_Truck_1_Suspension_5_12_13_11.jpg
9	Suspension F, Truck #1	
10	Tractor, Truck #2	390100_Truck_2_Tractor_12_13_11.jpg
11	Trailer/Load, Truck #2	390100_Truck_2_Trailer_12_13_11.jpg
12	Kingpin Offset, Truck #2	
13	Suspension A, Truck #2	390100_Truck_2_Suspension_1_12_13_11.jpg
14	Suspension B, Truck #2	390100_Truck_2_Suspension_2_12_13_11.jpg
15	Suspension C, Truck #2	390100_Truck_2_Suspension_3_12_13_11.jpg
16	Suspension D, Truck #2	390100_Truck_2_Suspension_4_12_13_11.jpg
17	Suspension E, Truck #2	390100_Truck_2_Suspension_5_12_13_11.jpg
18	Suspension F, Truck #2	
19	Tractor, Truck #3	
20	Trailer/Load, Truck #3	
21	Kingpin Offset, Truck #3	
22	Suspension A, Truck #3	
23	Suspension B, Truck #3	
24	Suspension C, Truck #3	
25	Suspension D, Truck #3	
26	Suspension E, Truck #3	
27	Suspension F, Truck #3	
28	Scale	
29		
30		

RECORDED BY: _____ Dean J Wolf