Submitted by: NYCDOT, C2SMART, MDOT & KISTLER

FORM 15, ATTACHMENT A Summary of WIM Calibration Data from Multiple States (NYC, MD, WI & IN) PROPOSAL TO AMEND NIST HANDBOOK 44, SECTION 2.25

A-1. New York City

Table 1. Calibration Results for Class 9, 3S2 Semi-Trailer Truck

Run	Speed (mph)	Measured GVW (lbs.) Target GVW (lbs.)		Error
1	40.9	80,257	79,080	1.49%
2	42.6	77,732	79,080	-1.70%
3	43.8	81,447	79,080	2.99%
4	14.6	77,179	79,080	-2.40%
5	16	80,207	79,080	1.43%
6	13.6	75,888 79,080		-4.04%

Table 2. Calibration Results for Class 9 Semi-Trailer Truck with a Split Tandem

Run	Speed (mph)	Measured GVW (lbs.)	Target GVW (lbs.)	Error
1	38.4	74,647	73,681	1.31%
2	39.8	72,745	73,681	-1.27%
3	41.4	73,914	73,681	0.32%
4	14.2	76,904	73,681	4.37%
5	14.9	74,490	73,681	1.10%
6	40.8	71,554	73,681	-2.89%

Table 3. Calibration Results for Class 6 Single Unit Truck

Run	Speed (mph)	Measured GVW (lbs.)	Target GVW (lbs.)	Error
1	42.3	72,034	71,640	0.55%
2	42.4	71,438	71,640	-0.28%
3	43.2	71,577	71,640	-0.09%
4	16	71,596	71,640	-0.06%
5	14.6	71,678	71,640	0.05%
6	43.1	71,517	71,640	-0.17%

Table 4. Calibration Results for Class 5 Single Unit Truck

Run	Speed (mph)	Measured GVW (lbs.)	Target GVW (lbs.)	Error
1	42.4	32,777	32,580	0.60%
2	39.3	33,225	32,580	1.98%
3	45.3	33,491	32,580	2.80%
4	17.4	32,581	32,580	0.00%
5	38.9	31,957	32,580	-1.91%
6	40.9	31,369	32,580	-3.72%
7	42.8	32,758	32,580	0.55%

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Submitted by: NYCDOT, C2SMART, MDOT & KISTLER

A-2. Maryland

Table 5. Calibration Results at US-50 East Lane 2 using Class 9, 3S2 Semi-Trailer Truck

Run	Speed (mph)	Measured GVW (lbs.) Target GVW (lk		Error
1	51.4	68,720	69,140	-0.61%
2	57.8	67,090	69,140	-2.96%
3	60.4	66,420	69,140	-3.93%
4	57.6	67,160	69,140	-2.86%
5	62.0	68,450	69,140	-1.00%
6	55.5	66,650	69,140	-3.60%
7	58.7	66,770	69,140	-3.43%
8	56.3	66,980	69,140	-3.12%
9	51.1	66,880	69,140	-3.27%
10	58.1	66,900	69,140	-3.24%

Table 6. Calibration Results at I-695S Lane 1 using Class 9, 3S2 Semi-Trailer Truck

Run	Speed (mph)	Measured GVW (lbs.)	Target GVW (lbs.)	Error
1	56.5	75,710	75,920	-0.28%
2	53.5	78,140	75,920	2.92%
3	57.4	76,940	75,920	1.34%
4	46.9	78,800	75,920	3.79%
5	55.9	76,040	75,920	0.16%
6	57.1	76,130	75,920	0.28%
7	54.8	75,350	75,920	-0.75%
8	56.5	76,060	75,920	0.18%
9	52.7	75,590	75,920	-0.43%

Table 7. Calibration Results at I-695S Lane 2 using Class 9, 3S2 Semi-Trailer Truck

Run	Speed (mph)	Speed (mph) Measured GVW (lbs.)		Error
1	58.7	77,490	75,920	2.07%
2	57.6	78,440	75,920	3.32%
3	41.7	79,720	75,920	5.01%
4	59.5	78,380	75,920	3.24%
5	58.9	78,180	75,920	2.98%
6	58.5	77,890	75,920	2.59%
7	60.2	75,350	75,920	-0.75%
8	60	77,420	75,920	1.98%
9	59.7	76,950	75,920	1.36%
10	59.7	77,830	75,920	2.52%

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Submitted by: NYCDOT, C2SMART, MDOT & KISTLER

Table 8. Calibration Results at I-95S Lane 1 using Class 9, 3S2 Semi-Trailer Truck

Run	Speed (mph)	Measured GVW (lbs.)	Target GVW (lbs.)	Error
1	58.5	77,900	76,460	1.88%
2	58.0	77,750	76,460	1.69%
3	57.8	77,330	76,460	1.14%
4	51.6	78,700	76,460	2.93%
5	57.4	78,080	76,460	2.12%
6	58.1	76,060	76,460	-0.52%
7	58.7	79,340	76,460	3.77%
8	58.7	77,640	76,460	1.54%
9	56.4	76,370	76,460	-0.12%
10	55.7	77,070	76,460	0.80%

Table 9. Calibration Results at I-95S Lane 2 using Class 9, 3S2 Semi-Trailer Truck

Run	n Speed (mph) Measured GVW (lbs.)		Target GVW (lbs.)	Error
1	57.9	74970	76,460	-1.95%
2	62.0	79700	76,460	4.24%
3	62.1	75700	76,460	-0.99%
4	65.1	79940	76,460	4.55%
5	58.9	77670	76,460	1.58%
6	58.5	77600 76,460		1.49%
7	60.4	77180	76,460	0.94%
8	61.9	77670	76,460	1.58%
9	62.0	77040	76,460	0.76%
10	59.1	77850	76,460	1.82%

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Submitted by: NYCDOT, C2SMART, MDOT & KISTLER

A-3. Wisconsin

Table 10. Calibration Results Summary for Mainline

Start	End	No. of Runs	Criteria	% Compliance
		154	Single 15%	100%
1/14/21	1/21/21	302	Tandem 10%	98%
		181	GVW 6%	98%
		170	Single 15%	99%
1/28/21	2/4/21	335	Tandem 10%	97%
		195	GVW 6%	95%
		115	Single 15%	100%
6/24/21	7/1/21	222	Tandem 10%	100%
		135	GVW 6%	100%
	7/15/21	449	Single 15%	100%
7/8/21		884	Tandem 10%	99%
		498	GVW 6%	99%
		145	Single 15%	99%
7/15/21	7/22/21	277	Tandem 10%	98%
		167	GVW 6%	98%
		190	Single 15%	100%
7/22/21	7/29/21	371	Tandem 10%	95%
		206	GVW 6%	95%

Table 11. Calibration Results Summary for Ramp

Start	End	No. of Runs	Criteria	% Compliance
		134	Single 15%	98%
1/14/21	1/21/21	267	Tandem 10%	100%
		160	GVW 6%	99%
		166	Single 15%	100%
1/28/21	2/4/21	327	Tandem 10%	99%
		193	GVW 6%	95%
		112	Single 15%	100%
6/24/21	7/1/21	216	Tandem 10%	100%
		132	GVW 6%	100%
		390	Single 15%	100%
7/8/21	7/15/21	764	Tandem 10%	100%
		434	GVW 6%	100%
		128	Single 15%	98%
7/15/21	7/22/21	243	Tandem 10%	100%
		144	GVW 6%	98%
		164	Single 15%	100%
7/22/21	7/29/21	319	Tandem 10%	100%
		184	GVW 6%	98%

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FORM 15: PROPOSAL TO AMEND NIST HANDBOOK 44, SECTION 2.25 ATTACHMENT A FOR **S&T WIM-23.1**Submitted by: NYCDOT, C2SMART, MDOT & KISTLER

A-4. Indiana

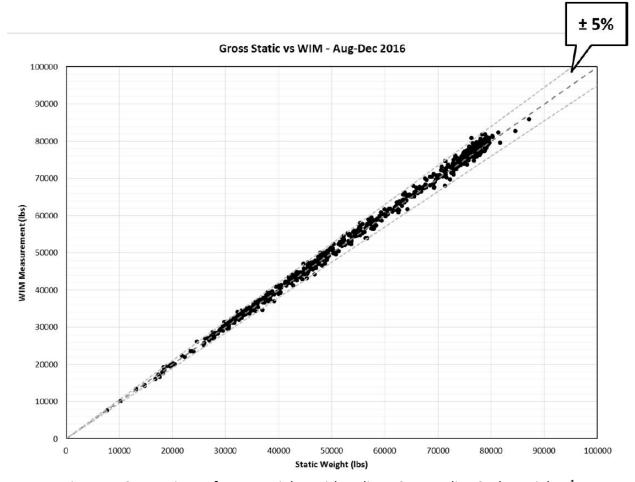


Figure 1. Comparison of WIM Weights with Indiana State Police Scale Weights ¹

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¹ https://docs.lib.purdue.edu/cgi/viewcontent.cgi?article=3195&context=jtrp 11/15/2022

BQE Calibration Results and Summary

- Four (4) Quartz sensors were installed in the center lane of the BQE Corridor in 2019.
- Five trucks (two Class 9 trucks 3S2 & 3S2 Split, one Class 6 truck, and two Class 5 trucks) were used for calibration tests I.
- Quartz sensors were able to comply with accuracy requirements for all standards (ASTM, NIST, OIML, and COST).
- The maximum error for GVW is 4.4% which meets the maximum tolerance of 6%. The single axle and tandem axle also meet the tolerance of 15% and 10%, respectively.

Standards	GVW	Single	Tandem
Quartz Results (max error, %)	4.4	12.4	8.0
Number of Test	30	30	42
ASTM Type III (%)	6	15	10
ASTM Type III Compliance (%)	100	100	100
NIST Class A (%)	10	20	15
OIML F10 (%)	5	8	8
COST A(5) (%)	5	8	7

NEW YORK CITY

- If other types of trucks not covered by this test were employed, the accuracy for other trucks would be improved.
- Accuracy varies depending on truck speed. However, the speed variance could be eliminated by the optimization process.
- Although the site included severe rutting, Quartz sensors met the accuracy and compliance for ASTM E1318 Type III.
- Calibration factors drifted slightly after the initial calibration.
 Routine calibration is highly recommended every 6 months.



measure. analyze. innovate.

09/14/2022 I-695W Lane 1 (Right lane)

Truck weight: 75920

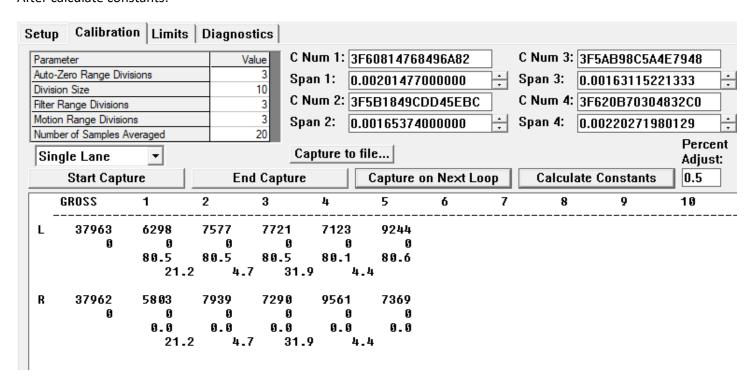
Span before Calibration:

C Num 1: 3F60814768496A82		C Num 3:	3F5BBDEBDE5FF22E]
Span 1: 0.00201477000000	\vdash	Span 3:	0.00169323000000	\vdash
C Num 2: 3F5B1849CDD45EBC		C Num 4:	3F60A5C4F613C300]
Span 2: 0.00165374000000	$\dot{\cdot}$	Span 4:	0.00203217000000	\vdash

Test truck pass:

	GROSS	1	2	3	4	5
L	35 02 0 0	5810 0 80.5	6990 0 80.5	7120 0 80.5	6570 0 80.1	8530 0 80.6
		21.2	4.7	31.9	4.4	
R	39410	6020	8240	7570	9930	7650
	9	9	9	9	9	9
		0.0	0.0	0.0	0.0	0.0
		21.2	4.7	31.9	4.4	

After calculate constants:

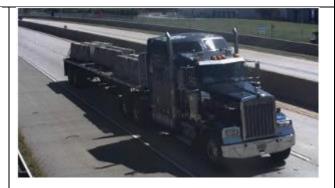


Test 1 – Gross Weight -0.29%

Vehicle ID: 401430 Lane: 1 09/14/2022 11:56:40 75700 lb 56.5 mph 62 ft Class 9

Spacing: 4.4 31.8 4.7

Axles: O O 0 0 0 Wt: 16310 17110 15150 15420 11720



Test 2 – Gross Weight 2.92%

Vehicle ID: 401545 Lane: 1 09/14/2022 12:06:59 78140 lb 53.5 mph 62 ft Class 9

Flags: Over wt tandems Comb. overwt *Violation*

31.9 4.7 21.2

Spacing: 4.4
Axles: • 0 0 Wt: 18030 16200 11210 16110 16590



Test 3 – Gross Weight 1.34%

Vehicle ID: 401661 Lane: 1 09/14/2022 12:16:44 76940 lb 57.4 mph 62 ft Class 9

Spacing: 4.4 31.9 4.8

Axles: O O 0 0 0 Wt: 16790 16370 15690 16360 11730



Test 4 – Gross Weight 3.79%

Vehicle ID: 401749 Lane: 1 09/14/2022 12:27:24 78800 lb 46.9 mph 62 ft Class 9

Flags: Over wt tandems Comb. overwt *Violation*

31.9 21.2

Spacing: 4.4
Axles: • 0 0 Wt: 17730 17270 16400 15890 11510



Test 5 – Gross Weight 0.16%

Vehicle ID: 401865 Lane: 1 09/14/2022 12:36:54 76040 lb 55.9 mph 62 ft Class 9

Spacing: 4.4 31.9 4.7 21.2

Axles: O O 0 0 0 15150 15770 Wt: 16650 16590 11880

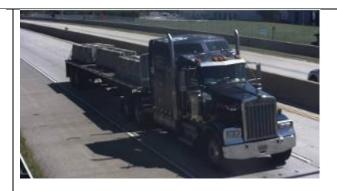


Test 6 - Gross Weight 0.26%

Vehicle ID: 401974 Lane: 1 09/14/2022 12:46:11 76120 lb 57.1 mph 62 ft Class 9

Spacing: 4.3 31.8

4.7 21.2 • • • 15250 15690 Axles: O O 0 Wt: 16390 16930 11870



Test 7 - Gross Weight -0.75%

Vehicle ID: 402088 Lane: 1 09/14/2022 12:57:00 75350 lb 54.8 mph 62 ft Class 9 31.9 Spacing: 4.4 4.7

0

15170 15610 11650



Test 8 – Gross Weight 0.18%

Vehicle ID: 402197 Lane: 1 09/14/2022 13:06:16 76060 lb 56.5 mph 62 ft Class 9

 Spacing:
 4.4
 31.8
 4.7
 21.1

 Axles:
 ◆
 ◆
 •

 Wt:
 16170 17670
 15110 15310

 11800



Test 9 – Gross Weight -0.45%

Vehicle ID: 402310 Lane: 1 09/14/2022 13:16:16 75580 lb 52.7 mph 61 ft Class 9

Spacing: 4.3 31.9 4.7 21.0

Axles: • 0 0 0 Wt: 17070 15810 15440 15650 11620



Test 10 – Gross Weight %

Vehicle ID: 402877 Lane: 1 09/14/2022 14:05:15 65360 lb 53.5 mph 40 ft Class 15

Flags: Over accel *Violation*

 Spacing:
 4.3
 31.7
 4.7
 0.0

 Axles:
 ♠
 ♠
 ♠
 ♠
 ♠

 Wt:
 16940 16710
 15930 15780 0



I-69	5W Lane	1									Actual	weight:		75920	
				Spacing			V	Veight							
	ID	Time	Speed	Sp4	Sp3	Spc 2	Spc 1	Ax5	Ax4	Ax3	Ax2	Ax 1	Position	Gross	Err %
1	401430	11:56:40	56.5	4.4	31.8	4.7	21.1	16310	17110	15150	15420	11720	Center	75700	-0.29
2	401545	12:06:59	53.5	4.4	31.9	4.7	21.2	18030	16200	16110	16590	11210	Center	78140	2.92
3	401661	12:16:44	57.4	4.4	31.9	4.8	21.2	16790	16370	15690	16360	11730	Center	76940	1.34
4	401749	12:27:24	46.9	4.4	31.9	4.7	21.2	17730	17270	16400	15890	11510	Center	78800	3.79
5	401865	12:36:54	55.9	4.4	31.9	4.7	21.2	16650	16590	15150	15770	11880	Center	76040	0.16
6	401974	12:46:11	57.1	4.3	31.8	4.7	21.2	16390	16930	15250	15690	11870	Center	76120	0.26
7	402088	12:57:00	54.8	4.4	31.9	4.7	21.2	16490	16430	15170	15610	11650	Center	75350	-0.75
8	402197	0:00:00	56.5	4.4	31.8	4.7	21.1	16170	17670	15110	15310	11800	Center	76060	0.18
9	402310	13:16:16	52.5	4.3	31.9	4.7	21.0	17070	15810	15440	15650	11620	Center	75580	-0.45
10	402877	14:05:15	53.5	4.3	31.7	4.7	0.0	16940	16710	15930	15780	0	Center		
												No data	a for Ax1		
														Min	-0.75
														Max	3.79
														Avg	0.80
														Range	4.54
														StdDev	1.58

Reduce span by 2.80 percent for average to be approximately minus two percent.

Before:

C Num 1: 3F60814768496A82	C Num 3: 3F5AB98C5A4E7948	
Span 1: 0.00201477000000	÷ Span 3: 0.00163115221333	-
C Num 2: 3F5B1849CDD45EBC	C Num 4: 3F620B70304832C0	
Span 2: 0.00165374000000	÷ Span 4: 0.00220271980129	-

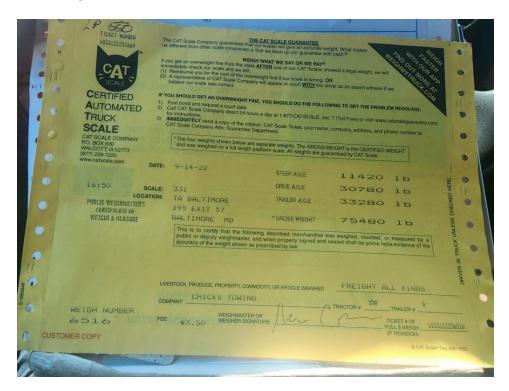
New span values:

C Num 1: 3F60814768496A82	C Num 3: 3F5AB98C5A4E7948
Span 1: 0.00195836 ÷	Span 3: 0.00158548
C Num 2: 3F5B1849CDD45EBC	C Num 4: 3F620B70304832C0
Span 2: 0.00160744 ÷	Span 4: 0.00214104

Static Weight Pre Calibration:



Static Weight Post Calibration:



09/14/2022 I-695W Lane 2 (Left Lane)

Truck weight: 75920

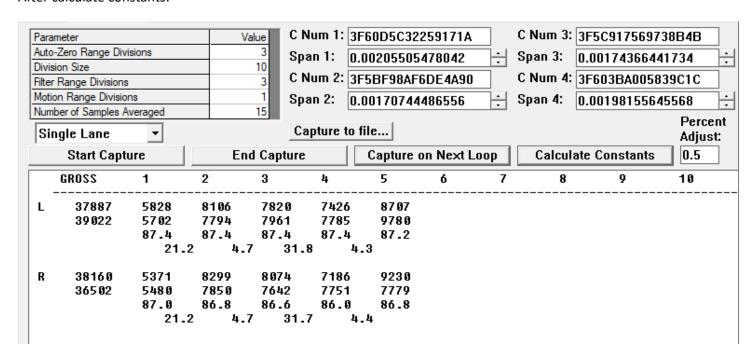
Span before Calibration:

C Num 1: 3F60814768496A82	C Num 3: 3F5AB98C5A4E7948
Span 1: 0.00201477000000 ÷	Span 3: 0.00163115221333 🗦
C Num 2: 3F5B1849CDD45EBC	C Num 4: 3F620B70304832C0
Span 2: 0.00165374000000	Span 4: 0.00220271980129 🗦
	_

Test truck pass:

	GROSS	1	2	3	4	5
L	38280	5740	7910	7850	7570	9210
	39700	5801	7930	8099	7920	9950
		87.4	87.4	87.4	87.4	87.2
		21.2	4.7	31.8	4.3	
R	35910	5210	7770	7560	7190	8180
	35164	5279	7562	7362	7467	7494
		87.0	86.8	86.6	86.0	86.8
		21.2	4.7	31.7	4.4	

After calculate constants:



Test 1 – Gross Weight 2.05%

Vehicle ID: 403453 Lane: 2 09/14/2022 14:48:09 77480 lb 58.7 mph 62 ft Class 9

Flags: Over wt tandems Comb. overwt *Violation*

Spacing: 4.4 31.9 4.7 21.1

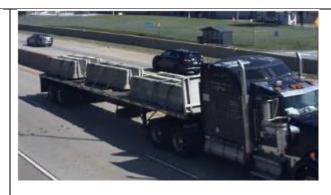


Test 2 – Gross Weight 3.32%

Vehicle ID: 403599 Lane: 2 09/14/2022 14:57:28 78440 lb 57.6 mph 62 ft Class 9

Flags: Over wt tandems Comb. overwt *Violation*

Spacing: 4.4 31.9 4.7 21.2



Test 3 – Gross Weight 4.99%

Vehicle ID: 403752 Lane: 2 09/14/2022 15:07:21 79710 lb 41.7 mph 61 ft Class 9

Flags: Over wt tandems Comb. overwt *Violation*

Spacing: 4.3 31.8 4.7 21.1



Test 4 – Gross Weight 3.24%

Vehicle ID: 403937 Lane: 2 09/14/2022 15:18:16 78380 lb 59.5 mph 62 ft Class 9

Flags: Over wt tandems Comb. overwt *Violation*

31.8 4.7 21.2

Spacing: 4.4
Axles: • 0 0 Wt: 17650 16960 11440 15980 16350



Test 5 - Gross Weight 2.98%

Vehicle ID: 404116 Lane: 2 09/14/2022 15:27:37 78180 lb 58.9 mph 62 ft Class 9

Flags: Over wt tandems Comb. overwt *Violation*

Spacing: 4.4

Axles: O O 0 0 0 Wt: 17840 17150 15720 16040 11430



Test 6 – Gross Weight 2.59%

Vehicle ID: 404269 Lane: 2 09/14/2022 15:37:21 77890 lb 58.5 mph 62 ft Class 9

Flags: Over wt tandems Comb. overwt *Violation*

31.9 21.2

Spacing: 4.4
Axles: • • •
Wt: 17840 17060 0 0 11380 15760 15850



Test 7 - Gross Weight -0.75%

Vehicle ID: 404424 Lane: 2 09/14/2022 15:46:30 75350 lb 60.2 mph 62 ft Class 9

Spacing: 4.4 31.9 4.7

Axles: O O 0 0 0 Wt: 17450 15480 15590 15420 11410



Test 8 – Gross Weight 1.98%

Vehicle ID: 404565 Lane: 2 09/14/2022 15:55:48 77420 lb 60.0 mph 62 ft Class 9

Flags: Over wt tandems Comb. overwt *Violation*

31.9 4.7 21.2

Spacing: 4.3
Axles: • • •
Wt: 17690 16850 0 0 15650 15830 11400



Test 9 – Gross Weight 1.37%

Vehicle ID: 404732 Lane: 2 09/14/2022 16:05:33 76960 lb 59.7 mph 62 ft Class 9

Spacing: 4.4 31.9 4.8

Axles: O O 0 0 0 Wt: 17220 16730 15760 15870 11370



Test 10 – Gross Weight 2.52%

Vehicle ID: 405214 Lane: 2 09/14/2022 16:28:25 77830 lb 59.7 mph 62 ft Class 9

Flags: Over wt tandems Comb. overwt *Violation*

31.9 4.7 21.2

Spacing: 4.4
Axles: • • •
Wt: 17820 17390 0 0 **O** 11140 15930 15550



I-695	5W Lane	2 (Left Lai	ne)								Actua	weight	t:	75920	
				Spacing				Weight							
	ID	Time	Speed	Sp4	Sp3	Spc 2	Spc 1	Ax5	Ax4	Ax3	Ax2	Ax 1	Position	Gross	Err %
1	403453	14:48:09	58.7	4.4	31.9	4.7	21.1	18070	16560	15950	16000	10910	Center	77480	2.05
2	403599	14:57:28	57.6	4.4	31.9	4.7	21.2	17200	17820	15760	16230	11430	Center	78440	3.32
3	403752	15:07:21	41.7	4.3	31.8	4.7	21.1	18210	17380	16640	16640	10850	Center	79710	4.99
4	403937	15:18:16	59.5	4.4	31.8	4.7	21.2	17650	16960	15980	16350	11440	Center	78380	3.24
5	404116	16:29:09	58.9	4.4	31.9	4.7	21.2	17840	17150	15720	16040	11430	Center	78180	2.98
6	404269	15:37:21	58.5	4.4	31.9	4.7	21.2	17840	17060	15760	15850	11380	Center	77890	2.59
7	404424	15:46:30	60.2	4.4	31.9	4.7	21.2	17450	15480	15590	15420	11410	Center	75350	-0.75
8	404565	15:55:48	60.0	4.3	31.9	4.7	21.2	17690	16850	15650	15830	11400	Left	77420	1.98
9	404732	16:06:33	59.7	4.4	31.9	4.8	21.3	17220	16730	15760	15870	11370	Left	76960	1.37
10	405214	16:28:25	59.7	4.4	31.9	4.7	21.2	17820	17390	15930	15550	11140	Center	77830	2.52
														Min	-0.75
														Max	4.99
														Avg	2.43
														Range	5.74
														StdDev	1.49

Reduce span by 4.4 percent for average to be approximately minus two percent.

Before:

C Num 1: 3F60D5C32259171A	C Num 3: 3F5C917569738B4B	
Span 1: 0.00205505478042	÷ Span 3: 0.00174366441734	<u>+</u>
C Num 2: 3F5BF98AF6DE4A90	C Num 4: 3F603BA005839C1C	
Span 2: 0.00170744486556	÷ Span 4: 0.00198155645568	-

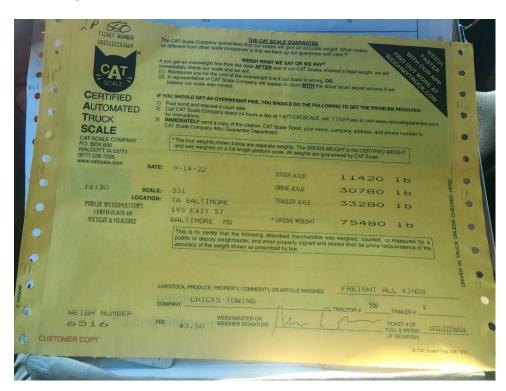
New span values:

C Num 1: 3F60D5C32259171A	C Num 3: 3F5C917569738B4B	
Span 1: 0.00196463	÷ Span 3: 0.00166694	+
C Num 2: 3F5BF98AF6DE4A90	C Num 4: 3F603BA005839C1C	
Span 2: 0.00163232	÷ Span 4: 0.00189437	-

Static Weight Pre Calibration:



Static Weight Post Calibration:



02/15/2019 US-50 East Lane 2 (Fast Lane)

Truck weight: 69140

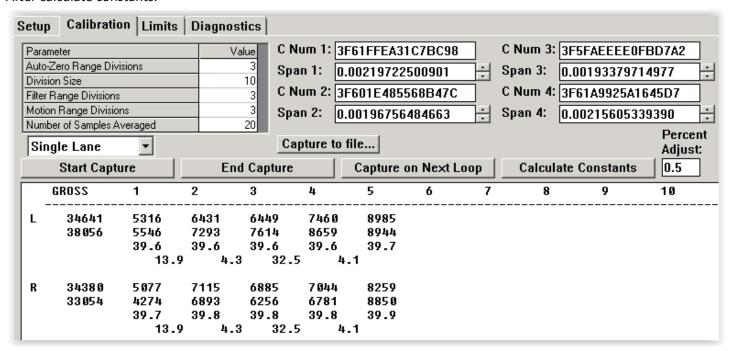
Span before Calibration:

C Num 1: 3F624F0D0373A7ED	C Num 3: 3F618914663E7861
Span 1: 0.00223496000000	÷ Span 3: 0.00214056000000 ÷
C Num 2: 3F60904608CDD9E8	C Num 4: 3F60FD5352627870
Span 2: 0.00202192000000	Span 4: 0.00207392000000 ÷

Test truck pass:

	GROSS	1	2	3	4	5
L	35920	5370	6780	6940	7960	8870
	36606	5335	7015	7324	8329	8603
		39.6	39.6	39.6	39.6	39.7
		13.9	4.3	32.5	4.1	
R	35960	4980	7470	7000	7370	9140
	36588	4731	7630	6925	7506	9796
		39.7	39.8	39.8	39.8	39.9
		13.9	4.3	32.5	4.1	

After calculate constants:



Test 1 – Gross Weight -0.61 %



Test 2 – Gross Weight -2.96 %



Test 3 – Gross Weight -3.92 %

 Vehicle ID: 579842 Lane: 2 02/15/2019 15:07:14 66430 lb 60.4 mph 55 ft Class 9

 Spacing: 4.1
 32.6
 4.3
 14.0

 Axles: 0
 0
 0
 0

 Wt: 16010 13280
 13010 13730
 10390



Test 4 – Gross Weight -2.88 %



Test 5 – Gross Weight -0.98 %

Vehicle ID: 580561 Lane: 2 02/15/2019 15:24:46 68460 lb 62.0 mph 54 ft Class 9

Spacing: 4.1 32.4 4.3 13.9

Axles: 0 0 0 0 0

Wt: 16790 14270 13420 13880 10090



Test 6 – Gross Weight -3.50 %

 Vehicle ID: 580862 Lane: 2 02/15/2019 15:32:35 66720 lb 55.5 mph 54 ft Class 9

 Spacing: 4.1
 32.4
 4.3
 13.9

 Axles: •
 •
 •
 •
 •

 Wt: 16910 13760
 12830 13410
 9810



Test 7 – Gross Weight -3.43%

Vehicle ID: 581220 Lane: 2 02/15/2019 15:41:42 66770 lb 58.7 mph 54 ft Class 9

Spacing: 4.1 32.4 4.3 13.9

Axles: 0 0 0 0

Wt: 16830 13350 13110 13530 9950



Test 8 – Gross Weight -3.14 %



Test 9 – Gross Weight -3.27 %

 Vehicle ID: 581837 Lane: 2 02/15/2019 15:58:20 66880 lb 51.1 mph 54 ft Class 9

 Spacing: 4.1
 32.4
 4.3
 14.0

 Axles: 0
 0
 0
 0

 Wt: 17480 13320
 12960 13360
 9760



Test 10 – Gross Weight -3.24 %

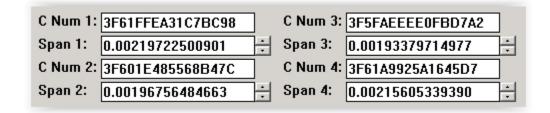
Vehicle ID: <u>582187</u> Lane: **2** 02/15/2019 16:06:35 **66900** lb **58.1** mph **54** ft Class **9** Spacing: 4.1 32.5 4.3 14.0



US-	50 East La	ane 2									Actual	weigh	t:	69140	
				Spacing				Weight							
	ID	Time	Speed	Sp4	Sp3	Spc 2	Spc 1	Ax5	Ax4	АхЗ	Ax2	Ax 1	Position	Gross	Err %
1	579186	14:49:42	51.4	4.1	32.5	4.3	14.0	17010	14410	13350	13790	10160	Center	68720	-0.61
2	579517	14:58:31	57.8	4.1	32.5	4.3	13.9	16960	13050	13000	13780	10300	Center	67090	-2.96
3	579842	15:07:14	60.4	4.1	32.6	4.3	14.0	16010	13280	13010	13730	10390	Center	66430	-3.92
4	580173	15:15:38	57.6	4.1	32.4	4.3	13.9	16860	13220	13380	13540	10160	Center	67150	-2.88
5	580561	15:24:46	62.0	4.1	32.4	4.3	13.9	16790	14270	13420	13880	10090	Center	68460	-0.98
6	580862	15:32:35	55.5	4.1	32.4	4.3	13.9	16910	13760	12830	13410	9810	Center	66720	-3.50
7	581220	15:41:42	58.7	4.1	32.4	4.3	13.9	16830	13350	13110	13530	9950	Center	66770	-3.43
8	581490	15:49:26	56.3	4.1	32.5	4.3	14.0	16840	13320	12950	13750	10120	Center	66970	-3.14
9	581837	15:58:20	51.1	4.1	32.4	4.3	14.0	17480	13320	12960	13360	9760	Center	66880	-3.27
10	582187	16:06:35	58.1	4.1	32.5	4.3	14.0	16810	13170	13310	13550	10060	Center	66900	-3.24
														Min	-3.92
														Max	-0.61
														Avg	-2.79
														Range	3.31
														StdDev	1.10

Increase span by 0.8 percent for average to be approximately minus two percent.

Before:



New span values:

C Num 1: 3F6224C5B2265859	C Num 3: 3F5FEFD4B9AB31F2
Span 1: 0.00221480000000	Span 3: 0.00194927000000 📑
C Num 2: 3F603F4D72CF805B	C Num 4: 3F61CDBD8D94A899
Span 2: 0.00198331000000 🗦	Span 4: 0.00217330000000 🗦

Static Weights Prior to Calibration



Static Weight After Calibration



October 11, 2022 I-95S Lane 1 (Right Lane)

Truck weight: 76,460 lbs.

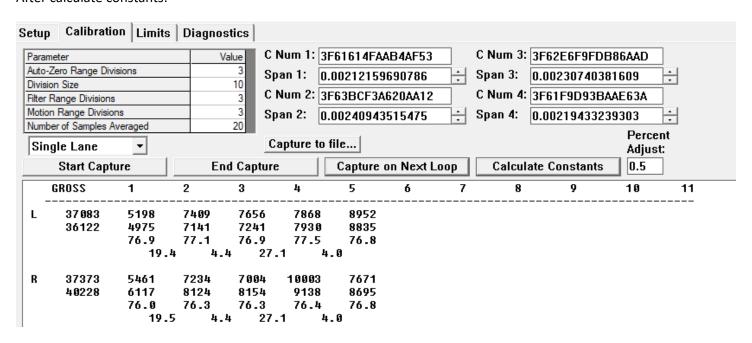
Span before Calibration:

C Num 1: 3F61	085086803748	C Num 3:	3F628634B7ED979E]
Span 1: 0.00	207916000000 🗦	Span 3:	0.00226126000000	\vdash
C Num 2: 3F63	857E670E2C12B	C Num 4:	3F619DD20D7E6DC4]
Span 2: 0.00	236125000000 ÷	Span 4:	0.00215045000000	÷

Test truck pass:

	GROSS	1	2	3	4	5
L	36510	5330	7390	7570	7320	8900
	37463	5340	7775	7932	7617	8799
		76.9	76.8	76.3	76.8	76.4
		17.0	4.6	29.2	4.0	
R	40800	5400	8920	8760	8420	9300
	40130	5823	8801	9275	6427	9804
		74.1	74.4	74.7	74.5	75.0
		17.0	4.7	29.1	4.0	

After calculate constants:



Test 1 – Gross Weight 1.88%

Vehicle ID: 761342 Lane: 1 10/11/2022 09:43:38 77900 lb 58.5 mph 54 ft Class 9

Flags: Overheight

Spacing: 4.0 29.3 4.6

Axles: O O 0 18180 15720 16320 16260 11430



Test 2 – Gross Weight 1.69%

Vehicle ID: 761592 Lane: 1 10/11/2022 09:55:03 77750 lb 58.0 mph 54 ft Class 9

Flags: Overheight Over wt tandems Comb. overwt *Violation*

Spacing: 4.0 29.2 4.6 17.0

Axles: O O 0 Wt: 18150 15870 16010 16200 11520



Test 3 – Gross Weight 1.14%

Vehicle ID: 761865 Lane: 1 10/11/2022 10:06:24 77330 lb 57.8 mph 54 ft Class 9 Flags: Over wt tandems Comb. overwt *Violation*

Spacing: 4.0 29.3 4.6

17.0 Axles: O O 0

Wt: 18480 15580 15520 16140 11600



Test 4 – Gross Weight 2.93%

Vehicle ID: 762150 Lane: 1 10/11/2022 10:18:46 78700 lb 51.6 mph 54 ft Class 9

Flags: Over wt tandems Comb. overwt *Violation*

Spacing: 4.0 29.2 4.6 17.0

Axles: O O

0 Wt: 18140 16950 10760 16380 16470



Test 5 – Gross Weight 2.12%

Vehicle ID: 762420 Lane: 1 10/11/2022 10:30:30 78080 lb 57.4 mph 54 ft Class 9

Flags: Over wt tandems Comb. overwt *Violation*

Spacing: 4.0 29.2 4.6 17.0

Axles: O O 0

0 Wt: 18640 15750 15850 16420 11430



Test 6 – Gross Weight -0.52%

Vehicle ID: 762761 Lane: 1 10/11/2022 10:45:13 76060 lb 58.1 mph 54 ft Class 9

Spacing: 4.0 29.3 4.6 17.0

0 0 Axles: O O 0

16040 16140 11060 Wt: 17990 14830



Test 7 – Gross Weight 3.77%

Vehicle ID: 763158 Lane: 1 10/11/2022 11:02:45 79340 lb 58.7 mph 54 ft Class 9

Flags: Over wt tandems Comb. overwt *Violation*

Spacing: 4.0 29.2 4.6 17.0

Axles: O O

0 18320 17430 Wt: 15890 16320 11390



Test 8 – Gross Weight 1.54%

Vehicle ID: 763461 Lane: 1 10/11/2022 11:15:01 77640 lb 58.7 mph 54 ft Class 9

Spacing: 4.0 29.3 4.6 17.0

Axles: O O 0 0 0 Wt: 18130 15790 16070 16300 11340



Test 9 – Gross Weight -0.12%

Vehicle ID: 763732 Lane: 1 10/11/2022 11:26:20 76370 lb 56.4 mph 55 ft Class 9

Spacing: 4.0 29.3 4.7 17.1

0 0 Axles: O O 0 11380 17950 16000 15370 15660 Wt:



Test 10 – Gross Weight 0.80%

Vehicle ID: 764000 Lane: 1 10/11/2022 11:37:44 77070 lb 55.7 mph 54 ft Class 9

Flags: Over wt tandems Comb. overwt *Violation*

Spacing: 4.0 29.3 4.6 17.0

Axles: O O 0 0

0 18060 16160 16080 15940 10840 Wt:



1958	Lane 1										Actual wei	ght:		76460	
					S	pacing				Weight					
	ID	Time	Speed	Spc 4	Spc 3	Spc 2	Spc 1	Ax5	Ax4	Ax3	Ax2	Ax 1	Position	Gross	Err %
1	761342	9:43:38	58.5	4.0	29.3	4.6	17.0	18180	15720	16320	16260	11430	Center	77900	1.88
2	761592	9:55:03	58.0	4.0	29.2	4.6	17.0	18150	15870	16010	16200	11520	Center	77750	1.69
3	761865	10:06:24	57.8	4.0	29.3	4.6	17.0	18480	15580	15520	16140	11600	Center	77330	1.14
4	762150	10:18:46	51.6	4.0	29.2	4.6	17.0	18140	16950	16380	16470	10760	Center	78700	2.93
5	762420	10:30:30	57.4	4.0	29.2	4.6	17.0	18640	15750	15850	16420	11430	Cetner	78080	2.12
6	762761	10:45:13	58.1	4.0	29.3	4.6	17.0	17990	14830	16040	16140	11060	Center	76060	-0.52
7	763158	11:02:45	58.7	4.0	29.2	4.6	17.0	18320	17430	15890	16320	11390	Center	79340	3.77
8	763461	11:15:01	58.7	4.0	29.3	4.6	17.0	18130	15790	16070	16300	11340	Center	77640	1.54
9	763732	11:26:20	56.4	4.0	29.3	4.7	17.1	17950	16000	15370	15660	11380	Center	76370	-0.12
10	764000	11:37:44	55.7	4.0	29.3	4.6	17.0	18060	16160	16080	15940	10840	Center	77070	0.80
														Min	-0.52
														Max	3.77
														Avg	1.52
														Range	4.29
														StdDev	1.35

Decreased span by 3.5 percent for average to be approximately minus two percent.

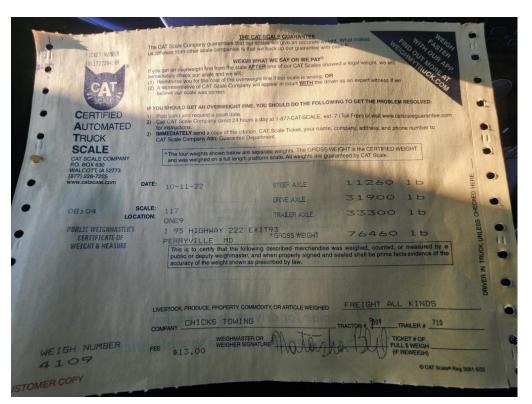
Before:

C Num 1:	3F6252C7A7016832]	C Num 3:	3F626D7808A96E2A	
Span 1:	0.00223673815348	+	Span 3:	0.00224946445569	-
C Num 2:	3F6220022B9FCBC8		C Num 4:	3F61DB77409A51B5	
Span 2:	0.00221252845676		Span 4:	0.00217984477497	+

New span values:

C Num 1:	3F6252C7A7016832	C Num 3:	3F626D7808A96E2A	
Span 1:	0.00215845	Span 3:	0.00217073	÷
C Num 2:	3F6220022B9FCBC8	C Num 4:	3F61DB77409A51B5	
Span 2:	0.00213509	Span 4:	0.00210355	÷

Static weight ticket prior to Calibration:



Static weight ticket post Calibration:



October 11, 2022 I-95S lane 2 (left lane)

Truck weight: 76,460 lbs.

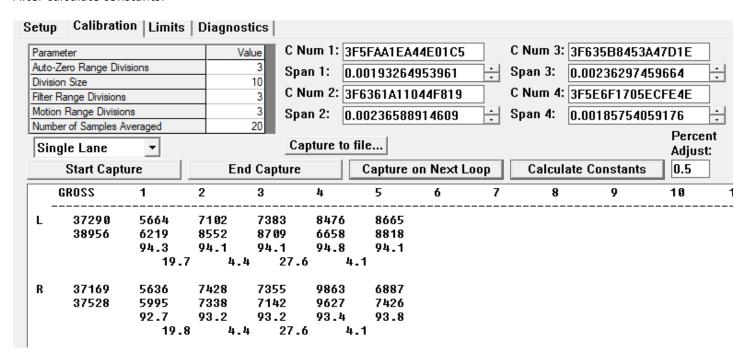
Span before Calibration:

C Num 1: 3F5EBC9922FC2E64	C Num 3: 3F62CA524923099A	
Span 1: 0.00187602000000		÷
C Num 2: 3F62D041A1600C85	C Num 4: 3F5D8ACA9ECA300F	
Span 2: 0.00229657000000	⊕ Span 4: 0.00180311000000	-

Test truck pass:

	GROSS	1	2	3	4	5	6
L	39640	6180	8150	8370	7850	9090	
	41243	6584	9054	9220	7049	9336	
		94.3	94.1	94.1	94.8	94.1	
		19.7	4.4	27.6	4.1		
R	36480	5680	7210	7080	9520	6990	
	36525	5834	7142	6951	9370	7228	
		92.7	93.2	93.2	93.4	93.8	
		19.8	4.4	27.6	4.1		

After calculate constants:

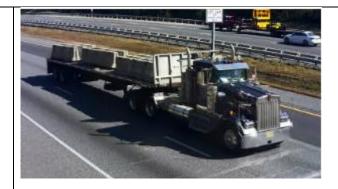


Test 1 – Gross Weight -1.95%

Vehicle ID: 767204 Lane: 2 10/11/2022 13:51:22 74970 lb 57.9 mph 56 ft Class 9

Spacing: 4.1 30.0 4.8 17.4

Axles: • 0 0 Wt: 15970 15820 15560 16130 11490



Test 2 – Gross Weight 4.24%

Vehicle ID: 767477 Lane: 2 10/11/2022 14:01:26 79700 lb 62.0 mph 56 ft Class 9

Flags: Over wt tandems Comb. overwt *Violation*

4.7 17.4

Spacing: 4.1 29.9 Axles: O O 0 0

0 Wt: 16670 17300 16730 17520 11490



Test 3 – Gross Weight -0.99%

Vehicle ID: 767757 Lane: 2 10/11/2022 14:12:41 75700 lb 62.1 mph 56 ft Class 9

Flags: Over wt tandems Comb. overwt *Violation*

Spacing: 4.1 30.0

Axles: O O 0

11460 Wt: 16270 13900 16680 17390



Test 4 - Gross Weight 4.55%

Vehicle ID: 768026 Lane: 2 10/11/2022 14:22:55 79940 lb 65.1 mph 56 ft Class 9

Flags: Over wt tandems Comb. overwt *Violation*

Spacing: 4.1 29.9

Axles: 0 0 Wt: 16990 17590 4.8 17.4

O O 16200 17080

12080



Test 5 – Gross Weight 1.58%

Vehicle ID: 768333 Lane: 2 10/11/2022 14:35:03 77670 lb 58.9 mph 56 ft Class 9

Spacing: 4.1 29.9 4.7 17.3



Test 6 – Gross Weight 1.49%

Vehicle ID: 768600 Lane: 2 10/11/2022 14:46:17 77600 lb 58.5 mph 56 ft Class 9

Spacing: 4.1 29.9 4.7 17.3



Test 7 – Gross Weight 0.94%

Vehicle ID: 768859 Lane: 2 10/11/2022 14:56:39 77180 lb 60.4 mph 56 ft Class 9

Spacing: 4.1 29.9 4.7 17.3



Test 8 – Gross Weight 1.58%

Vehicle ID: 769145 Lane: 2 10/11/2022 15:08:06 77670 lb 61.9 mph 56 ft Class 9

Flags: Over wt tandems Comb. overwt *Violation*

Spacing: 4.1 30.0 4.7 17.3



Test 9 – Gross Weight 0.76%

Vehicle ID: 769461 Lane: 2 10/11/2022 15:19:25 77040 lb 62.0 mph 55 ft Class 9

Spacing: 4.0 29.9 4.7 17.3



Test 10 – Gross Weight 1.82%

Vehicle ID: 769741 Lane: 2 10/11/2022 15:30:00 77850 lb 59.1 mph 56 ft Class 9

Spacing: 4.1 30.0 4.8 17.3



1958	Lane 2										Actual wei	ght:		76460	
					Sp	oacing				Weight					
	ID	Time	Speed	Spc 4	Spc 3	Spc 2	Spc 1	Ax5	Ax4	Ax3	Ax2	Ax 1	Position	Gross	Err %
1	767204	13:51:22	57.9	4.1	30.0	4.8	17.4	15970	15820	15560	16130	11490	Center	74970	-1.95
2	767477	14:01:26	62.0	4.1	29.9	4.7	17.4	16670	17300	16730	17520	11490	Center	79700	4.24
3	767757	14:12:41	62.1	4.1	30.0	4.8	17.4	16270	13900	16680	17390	11460	Center	75700	-0.99
4	768026	14:22:55	65.1	4.1	29.9	4.8	17.4	16990	17590	16200	17080	12080	Center	79940	4.55
5	768333	14:35:03	58.9	4.1	29.9	4.7	17.3	16440	15880	16000	17150	12200	Center	77670	1.58
6	768600	14:46:17	58.5	4.1	29.9	4.7	17.3	16770	15570	16670	17080	11500	Center	77600	1.49
7	768859	14:56:39	60.4	4.1	29.9	4.7	17.3	16500	15560	16480	17090	11540	Center	77180	0.94
8	769145	15:08:06	61.9	4.1	30.0	4.7	17.3	16680	15040	16960	17520	11470	Center	77670	1.58
9	769461	15:19:25	62.0	4.0	29.9	4.7	17.3	16560	15700	16380	17010	11390	Center	77040	0.76
10	769741	15:30:00	59.1	4.1	30.0	4.8	17.3	16700	16390	15950	16890	11930	Center	77850	1.82
														Min	-1.95
														Max	4.55
														Avg	1.40
														Range	6.50
														StdDev	2.11

Decrease span by 3.40 percent to make an average of approximately minus 2 percent.

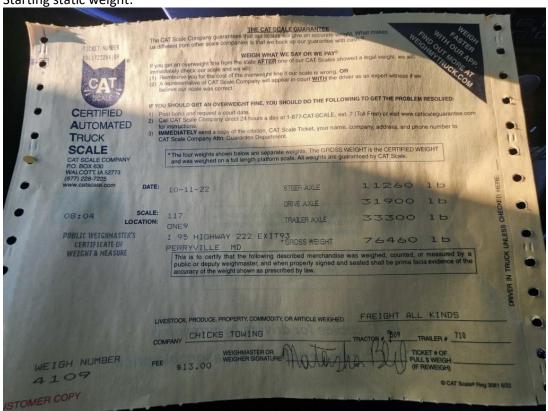
Spans before adjustment:

C Num 1: 3F5EBC9922FC2E64	C Num 3: 3F62CA524923099A
Span 1: 0.00180098 ÷	Span 3: 0.00220199 :
C Num 2: 3F62D041A1600C85	C Num 4: 3F5D8ACA9ECA300F
Span 2: 0.00220471 ÷	Span 4: 0.00173099

Spans after adjustment:

C Num 1: 3F5EBC9922FC2E64	C Num 3: 3F62CA524923099A
Span 1: 0.00173975	Span 3: 0.00212712 ÷
C Num 2: 3F62D041A1600C85	C Num 4: 3F5D8ACA9ECA300F
Span 2: 0.00212975	Span 4: 0.00167214

Starting static weight:



Ending static weight:



3/9/2021



Site: (ma1) WI_Madison Classification: From site Lanes: ADV_DRV Start class: 4 Start Date: 1/14/2021 12:00:00AM End class: 16 End Date: 1/21/2021 12:00:00AM

The following WIM accuracy values were used to calculate WIM compliance:

a. Single Axle: +/- 15%;b. Axle Group: +/- 10%; and

c. GVW: +/-6%.

The Pass/Fail Confidence value used was 90%.

Single Axle	Count	154
-	% Compliant	100%
	Result	PASS
Axle Group	Count	302
	% Compliant	98%
	Result	PASS
GVW	Count	181
	% Compliant	98%
	Result	PASS
Vehicle Count		181

Vehicles that were selected had valid weights, a static scale vehicle record with a GVW that is at least 75% of the legal limit, and did not have a status that invalidates it from being included.

Calculations performed as per ASTM E 1318, sections 7.2.7.2 and 7.2.7.3.

Caution: The data may include live and/or liquid loads. Per ASTM 1318, these vehicles should be excluded from WIM accuracy calculations, however, determination of such loads is not possible from the data. A manual check involving viewing vehicle images may be required.



Start class: 4 Start Date: 1/14/2021 12:00:00AM End class: 16 End Date: 1/21/2021 12:00:00AM

Lanes: RAMP

The following WIM accuracy values were used to calculate WIM compliance:

Site: (ma1) WI_Madison

Classification: From site

a. Single Axle: +/- 15%;

b. Axle Group: +/- 10%; and

c. GVW: +/-6%.

The Pass/Fail Confidence value used was 90%.

Single Axle	Count	134
· ·	% Compliant	98%
	Result	PASS
Axle Group	Count	267
	% Compliant	100%
	Result	PASS
GVW	Count	160
	% Compliant	99%
	Result	PASS
		400
Vehicle Count		160

Vehicles that were selected had valid weights, a static scale vehicle record with a GVW that is at least 75% of the legal limit, and did not have a status that invalidates it from being included.

3/9/2021

Calculations performed as per ASTM E 1318, sections 7.2.7.2 and 7.2.7.3.

Caution: The data may include live and/or liquid loads. Per ASTM 1318, these vehicles should be excluded from WIM accuracy calculations, however, determination of such loads is not possible from the data. A manual check involving viewing vehicle images may be required.

* To be statistically significant, this report must include a minimum of 80 vehicles. If fewer vehicles are used, the report results may not be valid. In this case, please re-run the report with a larger number of data collection files.

Data in this report: Any Grade of Files; Traffic Data: Selected - Both; Per Vehicle (Good Weight Vehicles)
Total counts as defined in report parameters:

Error + 213(0.7%)

Status Set 13,259(42.0%) Status Clear 18,075(57.3%) PV Total 31,547(100.0%) Good Weight 25,721(81.5%)

3/9/2021



Customizable WIM Compliance

Site: (ma1) WI_Madison Classification: From site Lanes: ADV_DRV

Start class: 4 Start Date: 1/28/2021 12:00:00AM End class: 16 End Date: 2/4/2021 12:00:00AM

The following WIM accuracy values were used to calculate WIM compliance:

a. Single Axle: +/- 15%; b. Axle Group: +/- 10%; and

c. GVW: +/-6%.

The Pass/Fail Confidence value used was 90%.

Single Axle	Count	170
· ·	% Compliant	99%
	Result	PASS
Axle Group	Count	335
	% Compliant	97%
	Result	PASS
GVW	Count	195
	% Compliant	95%
	Result	PASS
Vehicle Count		195

Vehicles that were selected had valid weights, a static scale vehicle record with a GVW that is at least 75% of the legal limit, and did not have a status that invalidates it from being included.

Calculations performed as per ASTM E 1318, sections 7.2.7.2 and 7.2.7.3.

Caution: The data may include live and/or liquid loads. Per ASTM 1318, these vehicles should be excluded from WIM accuracy calculations, however, determination of such loads is not possible from the data. A manual check involving viewing vehicle images may be required.





Site: (ma1) WI_Madison Start class: 4 Start Date: 1/28/2021 12:00:00AM Classification: From site End class: 16 End Date: 2/4/2021 12:00:00AM

Lanes: RAMP

The following WIM accuracy values were used to calculate WIM compliance:

a. Single Axle: +/- 15%;b. Axle Group: +/- 10%; and

c. GVW: +/-6%.

The Pass/Fail Confidence value used was 90%.

Single Axle	Count	166
· ·	% Compliant	100%
	Result	PASS
Axle Group	Count	327
	% Compliant	99%
	Result	PASS
GVW	Count	193
	% Compliant	95%
	Result	PASS
Vehicle Count		193

Vehicles that were selected had valid weights, a static scale vehicle record with a GVW that is at least 75% of the legal limit, and did not have a status that invalidates it from being included.

Calculations performed as per ASTM E 1318, sections 7.2.7.2 and 7.2.7.3.

Caution: The data may include live and/or liquid loads. Per ASTM 1318, these vehicles should be excluded from WIM accuracy calculations, however, determination of such loads is not possible from the data. A manual check involving viewing vehicle images may be required.

* To be statistically significant, this report must include a minimum of 80 vehicles. If fewer vehicles are used, the report results may not be valid. In this case, please re-run the report with a larger number of data collection files.

Data in this report: Any Grade of Files; Traffic Data: Selected - Both; Per Vehicle (Good Weight Vehicles)
Total counts as defined in report parameters:

Error Statu

765(2.3%)

Status Set 16,364(48.6%) Status Clear 16,513(49.1%) PV Total 33,642(100.0%)

Good Weight 23,204(69.0%)



Site: (ma1) WI_Madison Classification: From site Lanes: ADV_DRV Start class: 4 Start Date: 6/24/2021 12:00:00AM End class: 16 End Date: 7/1/2021 12:00:00AM

The following WIM accuracy values were used to calculate WIM compliance:

a. Single Axle: +/- 15%;b. Axle Group: +/- 10%; and

c. GVW: +/-6%.

The Pass/Fail Confidence value used was 90%.

Single Axle	Count	115
· ·	% Compliant	100%
	Result	PASS
	,	
Axle Group	Count	222
	% Compliant	100%
	Result	PASS
GVW	Count	135
	% Compliant	100%
	Result	PASS
Vehicle Count		135

Vehicles that were selected had valid weights, a static scale vehicle record with a GVW that is at least 75% of the legal limit, and did not have a status that invalidates it from being included.

Calculations performed as per ASTM E 1318, sections 7.2.7.2 and 7.2.7.3.

Caution: The data may include live and/or liquid loads. Per ASTM 1318, these vehicles should be excluded from WIM accuracy calculations, however, determination of such loads is not possible from the data. A manual check involving viewing vehicle images may be required.

7/1/2021



Customizable WIM Compliance

Site: (ma1) WI_Madison Classification: From site

Lanes: RAMP

Start class: 4 Start Date: 6/24/2021 12:00:00AM End class: 16 End Date: 7/1/2021 12:00:00AM

The following WIM accuracy values were used to calculate WIM compliance:

a. Single Axle: +/- 15%;b. Axle Group: +/- 10%; and

c. GVW: +/-6%.

The Pass/Fail Confidence value used was 90%.

Single Axle	Count	112
· ·	% Compliant	100%
	Result	PASS
Axle Group	Count	216
Axie Gloup	% Compliant	100%
	Result	PASS
GVW	Count	132
	% Compliant	100%
	Result	PASS
		400
Vehicle Count		132

Vehicles that were selected had valid weights, a static scale vehicle record with a GVW that is at least 75% of the legal limit, and did not have a status that invalidates it from being included.

Calculations performed as per ASTM E 1318, sections 7.2.7.2 and 7.2.7.3.

Caution: The data may include live and/or liquid loads. Per ASTM 1318, these vehicles should be excluded from WIM accuracy calculations, however, determination of such loads is not possible from the data. A manual check involving viewing vehicle images may be required.

* To be statistically significant, this report must include a minimum of 80 vehicles. If fewer vehicles are used, the report results may not be valid. In this case, please re-run the report with a larger number of data collection files.

Data in this report: Any Grade of Files; Traffic Data: Selected - Both; Per Vehicle (Good Weight Vehicles)
Total counts as defined in report parameters:

12,011(34.3%)

Error Status Set

240(0.7%)

Status Clear + 22,744(65.0%) PV Total 34,995(100.0%)

Good Weight 31,272(89.4%)



Site: (ma1) WI_Madison Classification: From site Lanes: ADV_DRV Start class: 4 Start Date: 7/8/2021 12:00:00AM End class: 16 End Date: 7/15/2021 12:00:00AM

The following WIM accuracy values were used to calculate WIM compliance:

a. Single Axle: +/- 15%;b. Axle Group: +/- 10%; and

c. GVW: +/-6%.

The Pass/Fail Confidence value used was 90%.

Single Axle	Count	449
· ·	% Compliant	100%
	Result	PASS
Axle Group	Count	884
	% Compliant	99%
	Result	PASS
GVW	Count	498
	% Compliant	99%
	Result	PASS
Vehicle Count		498

Vehicles that were selected had valid weights, a static scale vehicle record with a GVW that is at least 75% of the legal limit, and did not have a status that invalidates it from being included.

Calculations performed as per ASTM E 1318, sections 7.2.7.2 and 7.2.7.3.

Caution: The data may include live and/or liquid loads. Per ASTM 1318, these vehicles should be excluded from WIM accuracy calculations, however, determination of such loads is not possible from the data. A manual check involving viewing vehicle images may be required.

7/15/2021



Customizable WIM Compliance

Site: (ma1) WI_Madison Classification: From site

Lanes: RAMP

Start class: 4 Start Date: 7/8/2021 12:00:00AM End class: 16 End Date: 7/15/2021 12:00:00AM

The following WIM accuracy values were used to calculate WIM compliance:

a. Single Axle: +/- 15%;b. Axle Group: +/- 10%; and

c. GVW: +/-6%.

The Pass/Fail Confidence value used was 90%.

Single Axle	Count	390
· ·	% Compliant	100%
	Result	PASS
	,	
Axle Group	Count	764
	% Compliant	100%
	Result	PASS
GVW	Count	434
	% Compliant	100%
	Result	PASS
Vehicle Count		434

Vehicles that were selected had valid weights, a static scale vehicle record with a GVW that is at least 75% of the legal limit, and did not have a status that invalidates it from being included.

Calculations performed as per ASTM E 1318, sections 7.2.7.2 and 7.2.7.3.

Caution: The data may include live and/or liquid loads. Per ASTM 1318, these vehicles should be excluded from WIM accuracy calculations, however, determination of such loads is not possible from the data. A manual check involving viewing vehicle images may be required.

* To be statistically significant, this report must include a minimum of 80 vehicles. If fewer vehicles are used, the report results may not be valid. In this case, please re-run the report with a larger number of data collection files.

Data in this report: Any Grade of Files; Traffic Data: Selected - Both; Per Vehicle (Good Weight Vehicles)
Total counts as defined in report parameters:

Error 518(1.3%) Status Set 29,416(72.7%)

Status Clear 10,517(26.0%) PV Total 40,451(100.0%) Good Weight 35,444(87.6%)



Site: (ma1) WI_Madison Classification: From site Lanes: ADV_DRV Start class: 4 Start Date: 7/15/2021 12:00:00AM End class: 16 End Date: 7/22/2021 12:00:00AM

The following WIM accuracy values were used to calculate WIM compliance:

a. Single Axle: +/- 15%;b. Axle Group: +/- 10%; and

c. GVW: +/-6%.

The Pass/Fail Confidence value used was 90%.

Single Axle	Count	145
•	% Compliant	99%
	Result	PASS
Axle Group	Count	277
	% Compliant	98%
	Result	PASS
GVW	Count	167
	% Compliant	98%
	Result	PASS
Vehicle Count		167

Vehicles that were selected had valid weights, a static scale vehicle record with a GVW that is at least 75% of the legal limit, and did not have a status that invalidates it from being included.

Calculations performed as per ASTM E 1318, sections 7.2.7.2 and 7.2.7.3.

Caution: The data may include live and/or liquid loads. Per ASTM 1318, these vehicles should be excluded from WIM accuracy calculations, however, determination of such loads is not possible from the data. A manual check involving viewing vehicle images may be required.



Site: (ma1) WI_Madison Classification: From site

Lanes: RAMP

Start class: 4 Start Date: 7/15/2021 12:00:00AM End class: 16 End Date: 7/22/2021 12:00:00AM

The following WIM accuracy values were used to calculate WIM compliance:

a. Single Axle: +/- 15%;b. Axle Group: +/- 10%; and

c. GVW: +/-6%.

The Pass/Fail Confidence value used was 90%.

Single Axle	Count	128
· ·	% Compliant	98%
	Result	PASS
Axle Group	Count	243
	% Compliant	100%
	Result	PASS
GVW	Count	144
	% Compliant	98%
	Result	PASS
Vehicle Count		144

Vehicles that were selected had valid weights, a static scale vehicle record with a GVW that is at least 75% of the legal limit, and did not have a status that invalidates it from being included.

Calculations performed as per ASTM E 1318, sections 7.2.7.2 and 7.2.7.3.

Caution: The data may include live and/or liquid loads. Per ASTM 1318, these vehicles should be excluded from WIM accuracy calculations, however, determination of such loads is not possible from the data. A manual check involving viewing vehicle images may be required.

* To be statistically significant, this report must include a minimum of 80 vehicles. If fewer vehicles are used, the report results may not be valid. In this case, please re-run the report with a larger number of data collection files.

Data in this report: Any Grade of Files; Traffic Data: Selected - Both; Per Vehicle (Good Weight Vehicles)
Total counts as defined in report parameters:

Error 876(2.6%) Status Set 25,285(75.3%)

Status Clear 7,415(22.1%) PV Total 33,576(100.0%) Good Weight 29,077(86.6%)



Site: (ma1) WI_Madison Classification: From site Lanes: ADV_DRV Start class: 4 Start Date: 7/22/2021 12:00:00AM End class: 16 End Date: 7/29/2021 12:00:00AM

The following WIM accuracy values were used to calculate WIM compliance:

a. Single Axle: +/- 15%;b. Axle Group: +/- 10%; and

c. GVW: +/-6%.

The Pass/Fail Confidence value used was 90%.

Single Axle	Count	190
· ·	% Compliant	100%
	Result	PASS
Axle Group	Count	371
	% Compliant	95%
	Result	PASS
GVW	Count	206
	% Compliant	95%
	Result	PASS
Vehicle Count		206

Vehicles that were selected had valid weights, a static scale vehicle record with a GVW that is at least 75% of the legal limit, and did not have a status that invalidates it from being included.

Calculations performed as per ASTM E 1318, sections 7.2.7.2 and 7.2.7.3.

Caution: The data may include live and/or liquid loads. Per ASTM 1318, these vehicles should be excluded from WIM accuracy calculations, however, determination of such loads is not possible from the data. A manual check involving viewing vehicle images may be required.



Site: (ma1) WI_Madison Classification: From site

Lanes: RAMP

Start class: 4 Start Date: 7/22/2021 12:00:00AM End class: 16 End Date: 7/29/2021 12:00:00AM

The following WIM accuracy values were used to calculate WIM compliance:

a. Single Axle: +/- 15%;b. Axle Group: +/- 10%; and

c. GVW: +/-6%.

The Pass/Fail Confidence value used was 90%.

Single Axle	Count	164
-	% Compliant	100%
	Result	PASS
Axle Group	Count	319
	% Compliant	100%
	Result	PASS
GVW	Count	184
	% Compliant	98%
	Result	PASS
Vehicle Count		184

Vehicles that were selected had valid weights, a static scale vehicle record with a GVW that is at least 75% of the legal limit, and did not have a status that invalidates it from being included.

Calculations performed as per ASTM E 1318, sections 7.2.7.2 and 7.2.7.3.

Caution: The data may include live and/or liquid loads. Per ASTM 1318, these vehicles should be excluded from WIM accuracy calculations, however, determination of such loads is not possible from the data. A manual check involving viewing vehicle images may be required.

* To be statistically significant, this report must include a minimum of 80 vehicles. If fewer vehicles are used, the report results may not be valid. In this case, please re-run the report with a larger number of data collection files.

Data in this report: Any Grade of Files; Traffic Data: Selected - Both; Per Vehicle (Good Weight Vehicles)
Total counts as defined in report parameters:

Error 864(2.3%) Status Set 28,418(75.3%)

Status Clear 8,444(22.4%) PV Total 37,726(100.0%) Good Weight 32,944(87.3%)

To: Katie England, INDOT

From: Darcy Bullock, Purdue University

Wayne Bunnell, Purdue University Tim Wells, INDOT Research Division

Date: January 24, 2017

Subject: Evaluation of Kapsch Weigh-in Motion site in Chesterton, IN (EB I-94 at Mile Marker 28)

We are writing to summarize the results of discussion on January 19, 2017, and provide requested follow up information.

In the Spring of 2016, INDOT and Kapsch partnered to construct an evaluation WIM just west of the Brummit Road Overpass on EB I-94 at approximately Mile Marker 28 (Figure 1). Lane preparation and sensor installation occurred in May 2016 and calibration was performed by Kapsch in June 2016. On June 30, 2016, we received initial training by Kapsch and performed pilot testing of evaluation protocol with Indiana State Police (ISP). In July, plans were developed to conduct an evaluation over a variety of pavement temperatures during the period August to December and to summarize those results in January 2017.

A total of 615,872 Class 9 vehicles crossed over the WIM from August 1 to December 31, 2016. A Class 9 vehicle is the most common tractor trailer unit with 5 axles. We subsequently performed validation activities on randomly selected Class 9 trucks on August 3, September 6, October 5, November 9, and December 7, 2016. This validation involved photographing Class 9 vehicles weighed at the ISP EB I-94 Chesterton weigh station and matching those photographs with the photographs obtained from the cameras at the WIM (Figure 1). Only vehicles with no error flags (lane changes, acceleration, deceleration...) were selected for further study. A sample size of 688 vehicles was subsequently used to prepare the plot shown in Figure 2. All but 4 of the vehicles fall within +/- 5%. The four vehicles that were outside of that tolerance had discrepancies of -5.70%, +5.23%, -6.34%, and +5.41%.

We also prepared a histogram that counts the number of vehicles observed over 85,000 lbs, using a grouping size of 1,000 lbs. The distribution of the 595 vehicles over 85,000 lbs is shown in Figure 3. The number of trucks in each 1,000 lb grouping is shown above the bar. For example, one can see there were 37 trucks observed with a weight of 90,000-90,999 and 2 trucks over 110,000 during that period. The data shown in Figure 3 has not been validated on certified ISP scales (nor have the carriers been checked to see if they had an overweight permit issued by DOR), but given the close correlation between the WIM and certified scales shown in Figure 2, we believe Figure 3 accurately characterizes the frequency of overweight trucks in the right lane (Figure 1), by GVW, for the 5 month study period.

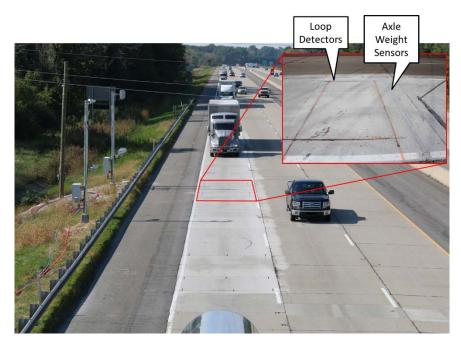


Figure 1: Site Photo of WIM (cameras on shoulder)

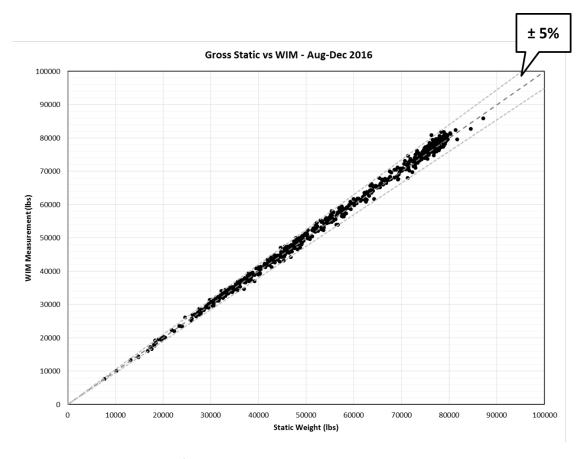


Figure 2: Comparison of WIM weights with Indiana State Police Static Scale Weights

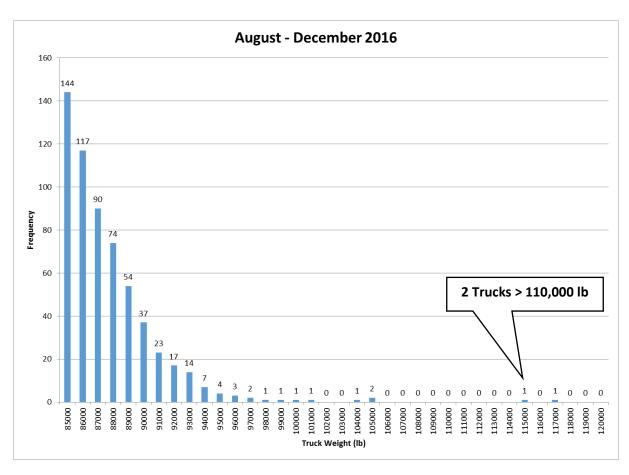


Figure 3: Count of vehicles over 85,000 lbs from August 1 to December 31, 2016.