Assessment Report for
Ohio, SPS Experiment 1

Visit date: November 12, 2003

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1 Executive Summary

A visit was made to the Ohio SPS-1 site on November 12th, 2003 for the purposes of conducting an assessment of the WIM system located on US Route 23 southbound at milepost 19.7. The roadway across the site was closed and prevented obtaining of all the necessary information to support a recommendation for evaluation.

This site is **not** recommended for a site validation. The average pavement index values exceed the threshold at which the smoothness of the pavement is expected to have no impact on equipment performance. There has been no direct observation of trucks across the WIM section (due to the lane closure). There has been no verification of the speed or classification output for this lane.

The WIM controller is used for the sensors at this site and at the SPS-2 site. Sensors at both locations are load cells.

All electrical and electronic equipment appears to be in working order. A visual inspection of the site discovered that the drainage area for the load cells is inadequate and needs to be improved. The software functionality could not be checked due to lack of traffic across the sensors.

There is no data to support a Sheet 16 for classification verification.

A visual survey of truck movement over the site could not be performed due to the rerouting of traffic.

A review of the speed information collected from the rerouted traffic on-site indicates that the range of truck speeds to be covered during an evaluation is 45 to 55 mph. Traffic speeds are expected to be independent of the actual roadway used on this route.

The pavement appears to be in a good condition except for the faulting at the transition of asphalt concrete pavement to cement concrete pavement 165 feet prior to the sensors. The LTPP WIM index thresholds for both SRI and LRI for the wheel path and runs to the right and left of it all exceed the threshold currently used to determine the impact of smoothness on equipment performance.

This site has 3 years of historical data. Based on available information and review of the data submitted through last year, this site still needs 5 years of data to meet the need for 5 years of research quality data. There is no validation information in the LTPP database for this site as of June 2003 upload. The available historical traffic data for 1998 is significantly different from 2000 and 2001. In order to consider the 1998 data as potentially of research quality for the site, additional investigation is required.

2 Corrective Actions Recommended

A visual inspection discovered that the drainage area for the load cells is inadequate and needs to be improved. Figure 15-1 shows the drainage culvert at the site. The culvert needs to be dug deeper or made larger to permit the proper permeation of water being drained from the load cell sensor.

Distress data supports the recommendation that pavement replacement is required at the asphalt/PCC transition point located 165 feet prior to the WIM scale area due to a moderate fault at the point of transition as shown in Figure 13-2. The actual truck/pavement interaction as a result of this fault could not be viewed on site or videotaped due to the rerouting of southbound traffic.

The consistent values of the smoothness index across all passes indicate that pavement remediation by grinding or complete replacement may be necessary. The pavement currently has transverse grooves throughout the section except immediately adjacent to the section. Their precise impact is unknown. If this is the typical practice for the state, and a pavement without grooves is not an option, doing an evaluation as a benchmark only rather than an annual activity should be considered.

3 Equipment inspection and diagnostics

The site is instrumented with Mettler-Toledo mechanical load cells and WIM controller. The controller is shared with the SPS-2 project in the northbound lanes.

There are two lanes of traffic in each direction being monitored by the WIM controller. The in-road equipment is installed in the driving lane in the southbound direction. It consists of a loop followed by a pair of offset Mettler-Toledo load cells staggered in the left and right wheel paths.

The sensor cabling is connected to signal processing electronics in a remote cabinet installed in the southbound right of way. Lead-in cables are then run to the main controller cabinet installed in the northbound right of way.

The telephone service originates from the telephone service pedestal installed in the southbound right of way. It is run through the remote cabinet before being terminated in the main controller cabinet. Power service is run to the remote cabinet from the main controller cabinet.

Electrical checks of system components verified that all equipment is working properly. Immediately following this visit the software for the site was upgraded. Before a validation is done, verification that the new software is in fact working and capable of producing valid output and the necessary comparison records is required. The reporting software is not working currently.

A visual inspection discovered that the drainage area for the load cells is inadequate and needs to be improved. This is cause for concern because the water can back up to the load cell pits and freeze, preventing the load cell mechanism from moving freely, reducing the weighing capability of the sensor. The culvert needs to be dug deeper or made larger to permit the proper permeation of water being drained from the load cell sensor.

All other support equipment such as service masts, telephone pedestal, cabinet, conduit, power service equipment, etc. is in good operational and physical condition.

4 Classification Verification with test truck recommendations

The agency uses the 13-bin classification scheme for classification data collection. It has used both the 13-bin and the Truck Weight Monitoring Study classification schemes in collecting weight data.

A sample of 1 hour of data was collected at the site. Video was taken at the site to provide ground truth for the evaluation. In the absence of comparison data, the video was reduced to determine a sample truck distribution. For the data collected there were 88 percent Class 9s, 4.2 percent class 8s and 3.4 percent Class 6s among the heavy truck population observed. This is consistent with the Wednesday data for November 2001, the closest available comparison set.

A review of the site data both collected on site and information from the LTPP traffic databases indicates that Class 9's and Class 8s constitute more than 10 percent of the truck population. As Class 8s are barely 10 percent, their use in validation is not considered critical compared to the 75 plus percent that are Class 9s. Based on this information in addition to the air-suspension 3S2, the second vehicle used for evaluation should be a Class 9. As this is an effectively unloaded site, a somewhat lighter vehicle with the same or different suspension is preferred. Due to the length of the truck turn around one additional vehicle should be used. It is recommended that it also be a Class 9. An unloaded vehicle would be acceptable.

5 Profile Evaluation

Profile data collected at the SPS WIM location by Stantec Inc. on December 6, 2002 was processed through the LTPP SPS WIM Index software. This WIM scale is installed on a cement concrete pavement. The results are shown in Table 1.

A total of 15 profiler passes were conducted over the WIM site. These included 5 passes at the center of the lane, 5 passes shifted to the left side of the lane, and 5 passes shifted to the right side of the lane. Shifts to the sides of the lanes were made such that data were collected as close to the lane edges as was safely possible. For each profiler pass, profiles were recorded under the left wheel path (LWP), and the right wheel path (RWP).

Table 1 shows the computed index values for all the 15 profiler passes for this WIM site. The average values over the five passes at each path were also calculated, as shown in the right most column of the table. Values above the index limits are presented in italics.

Table 1 Long Range Index (LRI) and Short Range Index (SRI)

Profiler Passes			Pass 1	Pass 2	Pass 3	Pass 4	Pass 5	Ave.
Center	LWP	LRI (m/km)	*1.138*	*1.261*	*1.269*	*1.199*	*1.336*	***1.241***
		SRI (m/km)	*1.240*	*1.351*	*1.352*	*1.606*	*1.509*	***1.412***
	RWP	LRI (m/km)	*0.829*	*0.841*	*0.898*	*0.983*	*0.850*	***0.880***
		SRI (m/km)	*1.227*	*1.190*	*1.172*	*2.081*	*1.216*	***1.377***
Left Shift	LWP	LRI (m/km)	*1.140*	*1.181*	*1.230*	*1.184*	*1.181*	***1.183***
		SRI (m/km)	*1.037*	*1.074*	*0.909*	*0.885*	*0.946*	***0.970***
	RWP	LRI (m/km)	*0.963*	*0.955*	*0.993*	*0.934*	*0.927*	***0.954***
		SRI (m/km)	*1.097*	*1.233*	*1.520*	*1.147*	*1.275*	***1.254***
Right Shift	LWP	LRI (m/km)	*1.171*	*1.112*	*1.029*	*1.138*	*1.134*	***1.117***
		SRI (m/km)	*1.100*	*1.134*	0.473	*1.175*	*1.017*	***0.980***
	RWP	LRI (m/km)	*0.876*	*0.954*	*0.962*	*1.028*	*1.070*	***0.978***
		SRI (m/km)	*1.445*	*1.420*	0.727	*1.198*	*1.166*	***1.191***

The WIM site is a section of pavement that is 305 meters long with the WIM scale located at 274.5 meters from the beginning of the test section. An ICC profiler was used to collect longitudinal profiles of the test section with a sampling interval of 25 millimeters. The LRI incorporates the pavement profile starting 25.8 m prior to the scale and ending 3.2 m after the scale in the direction of travel. The SRI incorporates a shorter section of pavement profile beginning 2.7 m prior to the WIM scale and ending 0.5 m after the scale.

All of the average LRI and SRI values exceed the limit of 0.789 m/km as can be seen in the table. When all values are less than 0.789 it is presumed unlikely that pavement conditions will significantly influence sensor output. Values above that level may or may not influence the reported weights and potentially vehicle spacings. Based on the profile data analysis, the Ohio SPS-1 WIM site does not meet the requirements for WIM site locations. If any remedial action is taken it should be done for the entire section. To avoid any doubts as to whether the sensors are collecting the data accurately the remediation has to be done prior to evaluation. Suggested alternatives for pavement corrections are grinding or slab replacement.

6 Distress survey and any applicable photos

The pavement appears to be in a good condition except for the faulting at the transition of asphalt concrete pavement to cement concrete pavement 165 feet prior to the sensors. Figure 13-1shows the overall condition of the pavement. Figure 13-2 shows the transition from asphalt concrete to cement concrete.

7 Vehicle-pavement interaction discussion

A visual survey of truck movement over the site could not be performed due to the rerouting of traffic.

8 Speed data with speed range recommendations for evaluation

Based on the data collected on site the 15th and 85th percentile speeds for Class 9s are 50 and 55 mph respectively. The upper end of the range matches the posted speed limit. This range does not vary significantly for other truck classes As a result the recommended speeds for test trucks in an evaluation are 45, 50 and 55 mph.

No speed measurements from the equipment were recorded. Speed measurement verification needs to be done before an evaluation of the site is performed.

The review of drive axle spacings in the LTPP traffic databases for this site for Class 9 vehicles indicates that speed measurements have not apparently affected the measurements of length and therefore vehicle classification. From on-site observation, verified by video data, the predominant drive axles for Class 9 vehicles are standard tandem. This indicates that the average drive axle spacing should be about 4.2 feet. According to the information from the traffic database the equipment is recording an axle spacing of 4.3 feet with a standard deviation of 0.3 feet. The expected industry average is 4.25 feet.

9 Traffic Data review: Overall Quantity and Sufficiency

As of November 19, 2003 this site does not have at least 5 years of research quality data. Research quality data is defined to be at least 210 days in a year of data of known calibration meeting LTPP's precision requirements. The precision requirements are shown in Table 2. Calibration information has not been provided for this site as of the June 2003 upload.

Table 2 Precision and Bias Requirements for Weight Data

Pooled Fund Site	**95 Percent Confidence Limit of Error**
Single Axles	± 20 percent
Axle groups	± 15 percent
Gross Vehicle Weight	± 10 percent
Vehicle Speed	±1 mph (2 kph)
Axle Spacing	± 0.5 ft (150 mm)

The amount and coverage for the site is shown in Table 3. As can be seen from the table 1998, 2000 and 2001 have a sufficient quantity. With the previously gathered information it can be seen from Table 3 that at least 2 additional years of research quality data are needed to meet the goal of a minimum of 5 years of weight data. The existing data may be nominally of research quality if comparisons of existing data taken immediately after validation indicate no significant difference in the loading patterns. There cannot have been any equipment replacement in the interval between collection and comparison.

Table 3 Amount of Traffic Data Available

Year	Classification Days	Months	Coverage	Weight Days	Months	Coverage
1998	261	11	Complete Week	273	11	Complete Week
2000	291	11	Complete Week	299	12	Complete Week
2001	283	12	Complete Week	289	12	Complete Week

Data that has validation information available is reviewed in light of the patterns present in the two weeks immediately following a validation/calibration activity. A determination of research quality data is based on the consistency with the validation pattern. Data that follows consistent and rational patterns in the absence of calibration information may be considered nominally of research quality pending validation information with which to compare it. Data that is inconsistent with expected patterns and has no supporting validation information is not considered research quality.

To evaluate the consistency of the existing data and determine its probable quality a series of reports and graphs have been generated. They include the SPS Summary report, vehicle distribution graphs, ESAL graphs, average daily steering axle weights for Class 9 vehicles, and GVW distributions both over all years and by month within years.

Based on this review it is recommended that further investigation be done for 1998 since the volumes are significantly different from 2000 and 2001. Review of the distribution and loading information indicate that they are essentially the same. Access was not provided to the truck level files so station IDs were not compared. There is no information in any of the publicly available databases to indicate what might account for a fivefold differential in volumes.

9.1 SPS Summary Report

The overall report is the SPS Summary Report. This report uses sets of benchmark data based on calibration information or consistent, rational data patterns. It shows the trend in some basic statistics at the site over time. It provides a numeric equivalent to the graphs typically run for the comparison evaluation process. It includes the number of days of data and statistics associated with Class 9 vehicles. They include the average numbers, average ESALs, the average steering axle weight and mean loaded and unloaded weight on a monthly basis. Class Days and Percent Class 9s are generated from classification data submissions. All other values come from the weight data submitted. Counts derived from weight data are available for all months. Loading statistics are only present when that data was loaded through LTPP's new traffic analysis software, since it is the only software that calculates them. The data is separated into blocks that depend on when the site was validated. Where there is no validation record an initial time point has been picked at which continuous data exists and that data is used as the basis for comparison. Excluded months have no data.

According to the results shown in Table 4 the percent of Class 9 vehicles was consistent in 2000 and 2001 but the percentage was significantly higher when compared to the consistent percentages in 1998. The loading information for 2000 and 2001 shows essentially constant loading patterns. The shift in percentages and volumes occurred between November and December 1998.

Table 4 SPS Summary Report

SPS Summary Report
Ohio 0100

South Lane 1

Comparison Date Weight - 17-February-1998 Classification - 17-February-1998

Month-Year	Class Days	Percent Class 9s	Weight Days	Average No. Class 9s	Avg.ESALs Per Class 9	Average Class 9 Steering	Mean Loaded Weight	Mean Unloaded Weight
Comparison values		3.7		110	1.28		78,218	35,103
FEB 1998	12	3.7	12	113	1.28			
MAR 1998	30	3.9	31	119	1.23			
APR 1998	30	3.6	30	133	1.26			
MAY 1998	17	3.7	17	147	1.16			
JUN 1998	30	3.2	30	127	1.20			
JUL 1998	31	2.5	30	105	1.21			
AUG 1998	30	3.1	31	106	1.21			
SEP 1998	8	2.5	14	59	1.15			
OCT 1998	12	3.4	17	86	1.18			
NOV 1998	30	2.8	30	106	1.21			
DEC 1998	31	11.2	31	815	1.18			
JAN 2000	11	13.4	14	807	1.19	10,936	78,867	35,465
FEB 2000	29	16.2	29	1311	1.17	10,879	78,532	35,280
MAR 2000	31	16.1	31	1297	1.16	10,897	78,248	35,146
APR 2000	30	14.5	30	1243	1.13	10,912	78,336	35,183
MAY 2000	30	14.1	31	1283	1.13	10,922	78,299	35,320
JUN 2000	30	14.0	30	1292	1.12	10,937	78,209	35,208
JUL 2000	22	11.7	22	1029	1.10	10,929	78,211	35,125
AUG 2000	23	13.3	23	1185	1.13	10,930	78,214	35,091
SEP 2000	26	13.7	26	1200	1.13	10,922	78,319	35,208
OCT 2000	28	13.6	28	1198	1.12	10,923	78,422	35,069
NOV 2000			27	1214	1.11	10,883	78,449	35,093
DEC 2000	31	12.9	31	981	1.10	10,790	78,569	35,199
JAN 2001	31	14.8	31	1116	1.18	10,939	78,573	35,201
FEB 2001	28	14.4	28	1179	1.14	10,895	78,253	35,014
MAR 2001	26	14.7	25	1241	1.13	10,888	78,168	35,026
MAY 2001	2	16.1	2	1152	1.15	11,100	78,469	35,705
JUN 2001	30	12.2	30	1008	1.12	11,080	80,140	35,751
JUL 2001	27	11.1	30	920	0.97	10,533	74,290	34,751
AUG 2001	20	12.9	26	979	0.81	9,978	72,689	33,813
SEP 2001	30	12.1	30	1065	0.97	10,520	74,194	34,471
OCT 2001	31	13.3	31	1036	1.13	10,959	78,496	35,174
NOV 2001	29	12.3	28	1120	1.12	10,932	78,640	35,386
DEC 2001	29	11.6	28	869	1.08	10,883	78,607	35,402

9.2 Vehicle Distribution

The vehicle distribution graphs indicate whether the fleet mix is stable over time and any day of week or seasonal patterns that may exist. The vehicle distribution graphs contain two types of comparisons, one between data types and one over time. The between types comparison is represented by the two columns for every time unit present. The column on the left generally labeled with a 4 is for classification data. The right hand column of the pair is for weight data. Whether or not the data is equivalent is perhaps more important than the variation over time. Figure 14-1 shows a typical by week pattern for classification data. The individual weeks show essentially the same mix to the fleet. Every vehicle in Classes 6 through 13 that constitutes at least 10 percent of the population is expected to stay within plus or minus 5 percent of the value observed during the two weeks following validation. This range is shown by the darker band inside the lighter band to the right of the weekly data. Weeks that go outside more than plus or minus 10 percent of the expected value will fall above or below the light gray areas of the band. These are weeks that should have been subjected to additional scrutiny prior to accepting the data as reasonable.

For this site the fleet mix is comparatively stable for 1998, 2000 and 2001 except for Class 8 trucks whose percentage was higher in 1998 but decreased since 2000.

Figure 14-2 shows the typical pattern for vehicle distribution by month by year for 2000 for the data collected from the classifier versus the data collected by the WIM equipment. The data for 2000 and 2001 were essentially the same. However, the volume for these two years is more than 5 times higher than in 1998 as shown in Figure 14-3. The reason for this sudden increase could not be determined. Figure 14-4 shows the comparative distribution of vehicles in the weight data for the three years. It should be noted that the relative percentages are the same in spite of the discrepancy in volumes.

An investigation of the 1998 data should be done. One option would be to see if the same station IDs were present for all years. If they are then it should be verified through either RSC or agency records that station IDs have not been reassigned in the interim. Additionally information might be sought on unusual activity in the area. According to LTPP data the site was open to traffic in November 1994 with the SPS-2 opening a year later so SPS construction activity should not have impacted the data.

9.3 ESALs per year

Average ESALs for Class 9 vehicles are a very crude method of identifying loading shifts. Figure 14-5 shows the average Class 9 ESALs per month for this location. To remove the influence of changing pavement structure all ESAL values have been computed with and SN = 5 and a p_t of 2.5. Average ESALs per Class 9 are not used as an indicator of research quality data. In the years 1998, 2000 and 2001 the average ESALs per year look similar except from July 2001 to September 2001 where the average is less.

9.4 Average Daily Steering Axle Weight

A frequently used statistic for checking scale calibration and doing auto-calibration of WIM equipment is the weight of the front axle. This value is site specific and should be relatively constant particularly for loaded Class 9s (vehicles in excess of 60,000 lbs.). Typically when autocalibration is used this value either cycles repeatedly or with very large truck volumes results in an essentially straight line for the mean. As shown in Figure 14-6 the average steering axle weights were essentially constant. However, as shown in Figure 14-7 in 2001 from July till September the average was around 10,000 lb. Figure 14-8 shows the typical weekly GVW patterns for class 9 vehicles prior to the decrease in steering axle weights. Figure 14-9 by contrast shows an example of the weeks with a decrease. Note that the peaks have bin shifted one bin to the left of their initial positions. The reason for the shift and the return to the original values is not known.

9.5 GVW Distributions for Class 9s

The Class 9 GVW graph is a generally accepted way to evaluate loading data reported at a site. A typical graph is has two peaks, one between 28,000 and 36,000 pounds and the other between 72,000 and 80,000 pounds. The first is the unloaded peak. The second, the loaded peak reflects the legal weight limit for a 5-axle tractor-trailer vehicle. Additionally, it is expected that less than 3 percent of the trucks will be excessively light (less than 12,000 pounds) and less than 5 percent will be significantly overweight (in excess of 96,000 pounds). Data that falls outside of the expected conditions needs a record of validation to verify that the pattern is in fact correct for the location. Data meeting the expected patterns is not automatically considered to be of research quality, merely rational as bias in scale measurements may shift the peaks in the data from their true values.

The overall assessment of loading patterns is done using a Class 9 GVW graph by year over the available years. Figure 14-10 shows the expected bimodal curve.
To investigate any seasonal variations the Class 9 GVW distributions are graphs by month by year. As shown in Figure 14-11 there is no significant difference between the three months illustrated either between themselves or with the annual average, which is hidden in the pattern. This graph is replicated for the remaining quarters of the year.

9.6 Axle Distributions

GVW graphs were not available for 1998. For all years a tandem axle distribution graph for Class 9 vehicles was created to evaluate the 1998 loading information.

As can be seen from Figure 14-12 the pattern for 1998, 2000 and 2001 is similar. Thus a GVW graph for 1998 should be similar to that for 2000 and 2001 since the weight of a Class 9 is dominated by its tandem axles.

10 Updated handout guide and Sheet 17

A copy of the handout has been included following page 19. It includes a current Sheet 17 with all applicable maps and photographs. There are no significant changes in the information provided.

11 Updated Sheet 18

A current Sheet 18 indicating the contacts conditions for assessments and evaluations has been attached following the updated handout guide.

12 Traffic Sheet 16(s) (Classification Verification only - Omitted)

Since no comparison data can be acquired, no Sheet 16 will be completed for this assessment.

13 Distress Photographs

Figure 13-1 Pavement Condition of 390100 site

Figure 13-2 Asphalt concrete to cement concrete pavement transition at 390100 site

14 Traffic Graphs

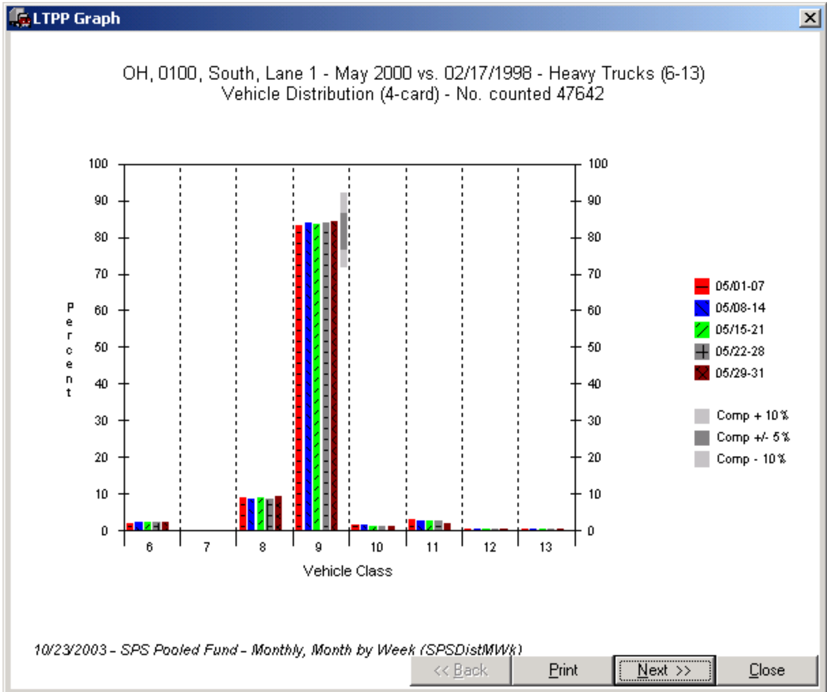


Figure 14-1 Typical Heavy Truck Distribution Pattern for Classification Data at 390100

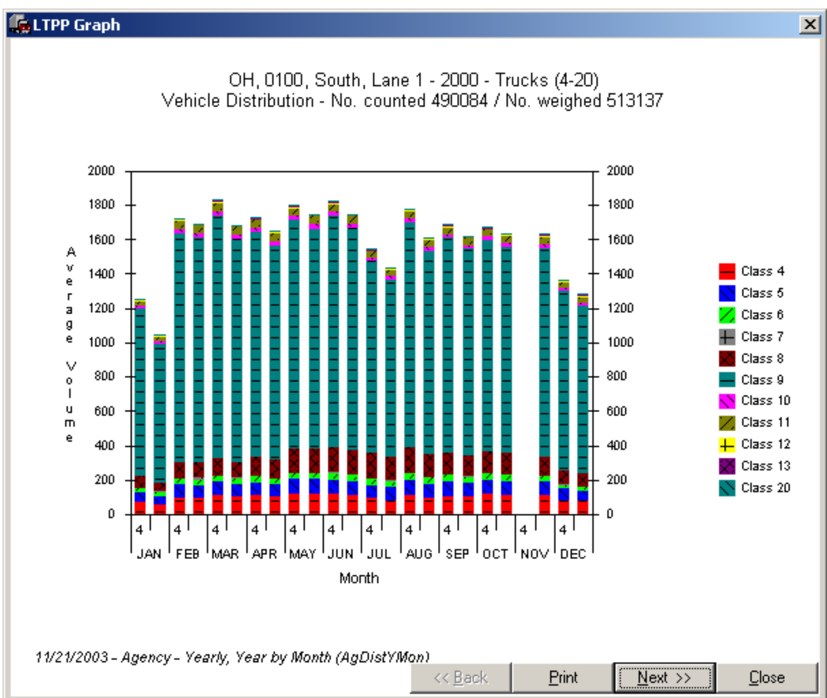


Figure 14-2 Typical Distribution by Vehicle Class and Month at 390100

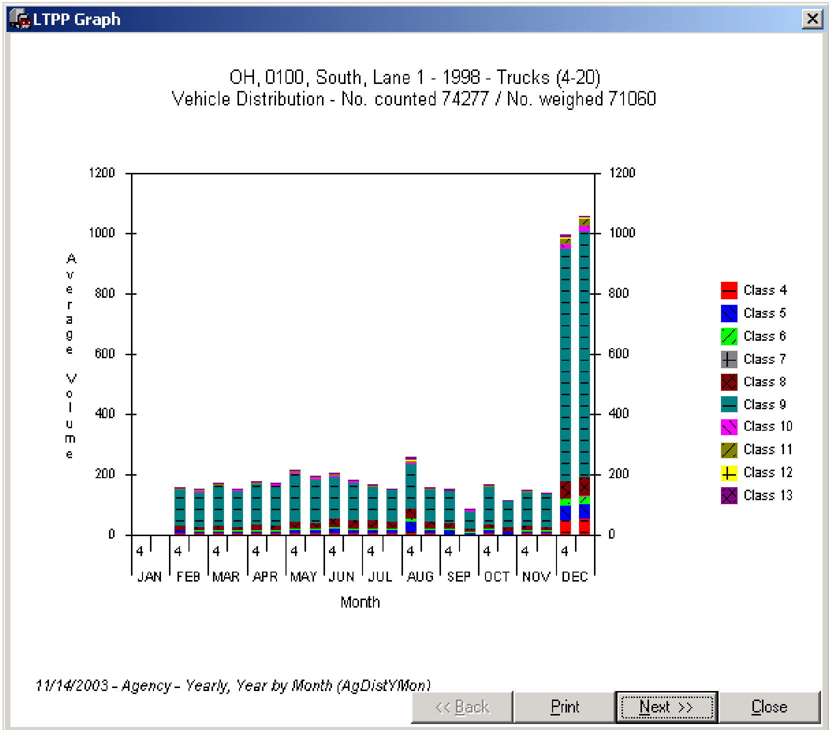


Figure 14-3 Vehicle Distribution by Month for the Year 1998 for 390100

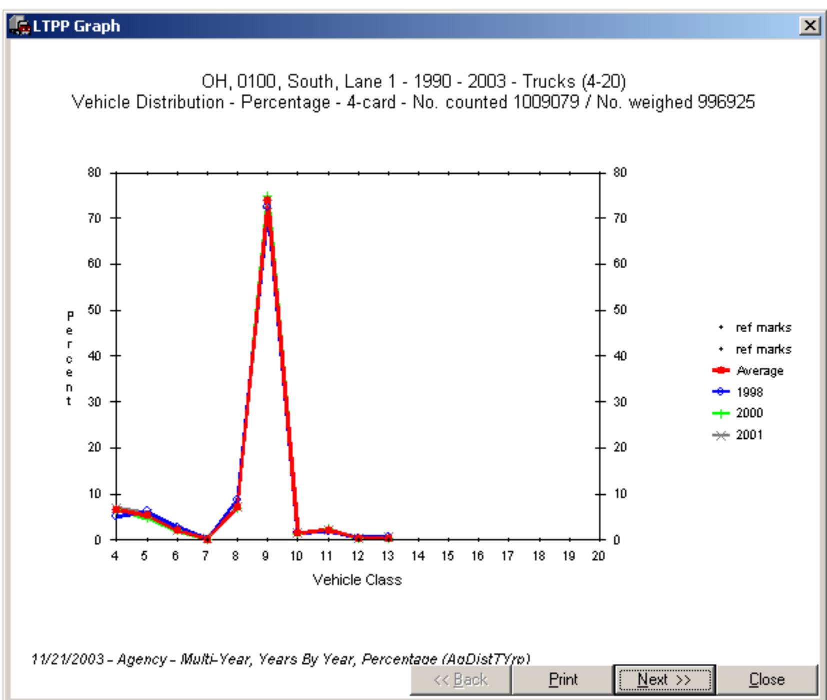


Figure 14-4 Comparative Vehicle Distributions for Weight Data 1998, 2000, 2001 at 390100

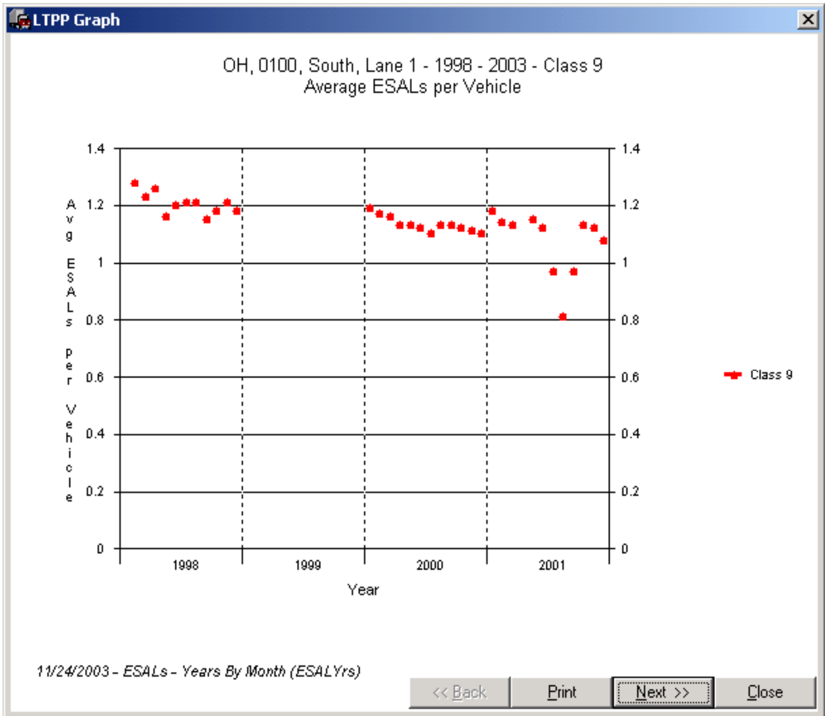


Figure 14-5 Average Class 9 ESALs for site from 1998 to 2001 for 390100

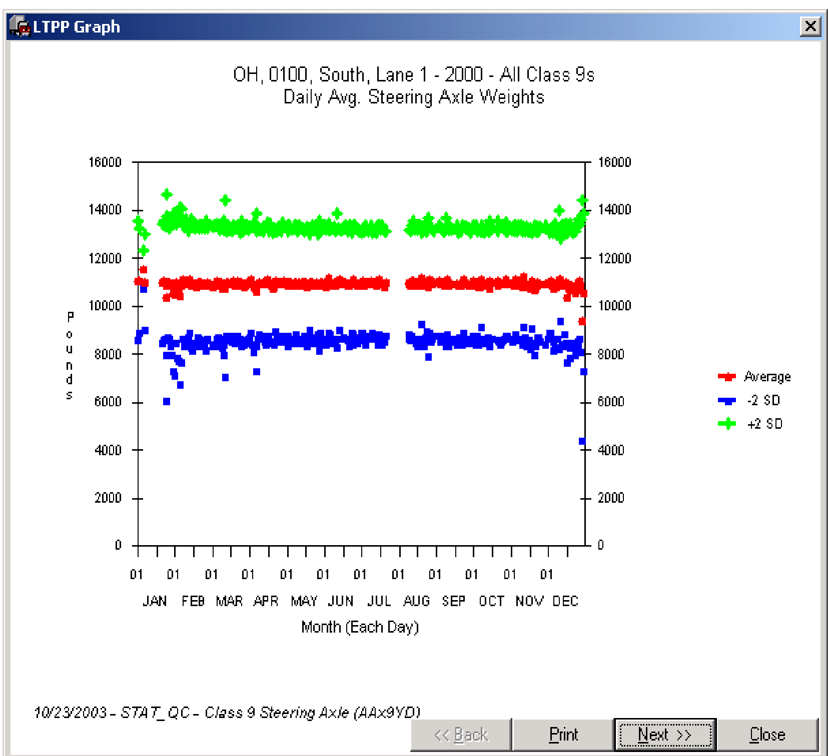


Figure 14-6 Average Daily Class 9 Steering Axle Weight - 2000 for 390100

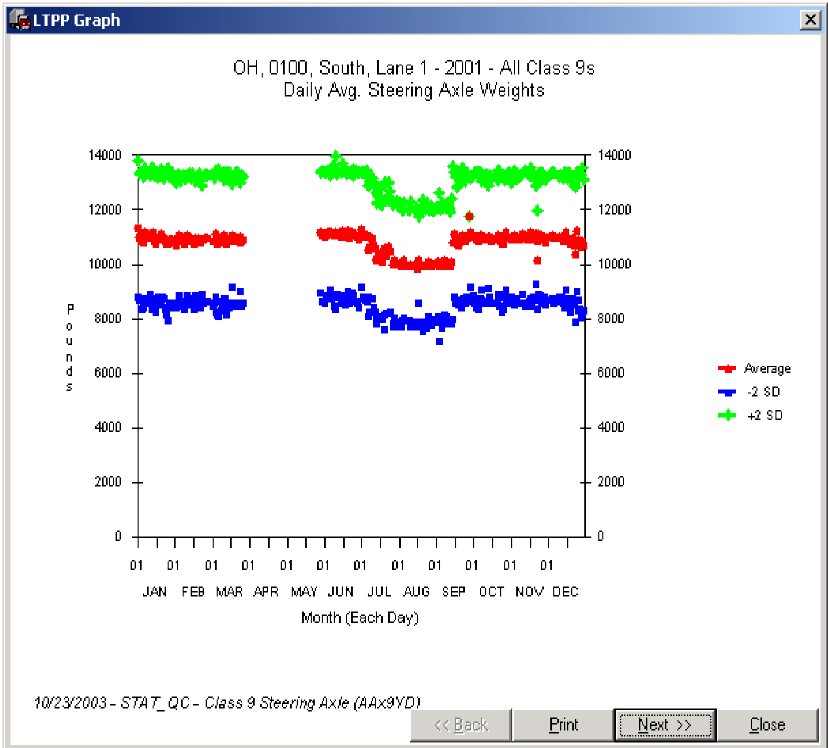


Figure 14-7 Average Daily Class 9 Steering Axle Weight - 2001 for 390100

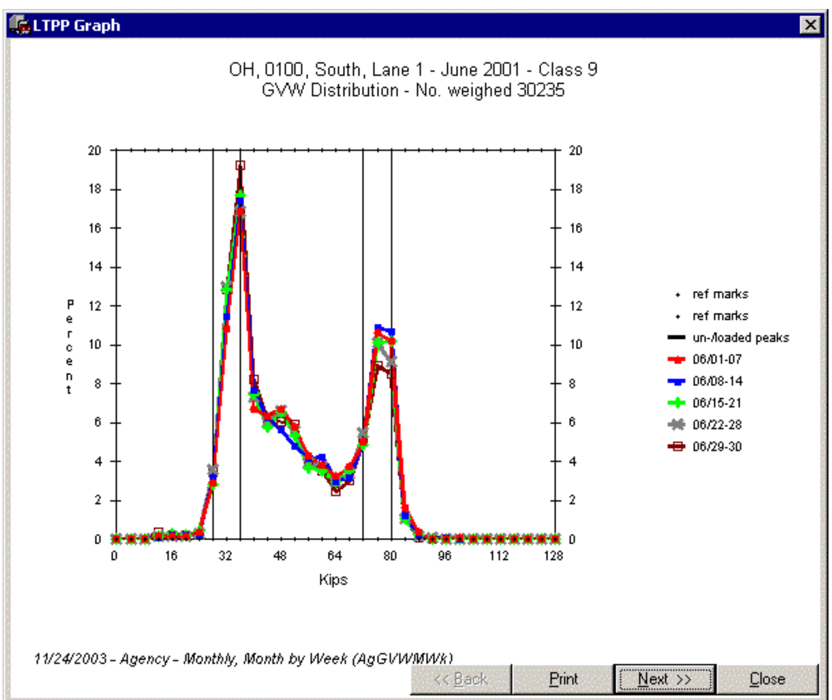


Figure 14-8 By week distribution prior to drop in steering axle weights summer 2001 for 390100

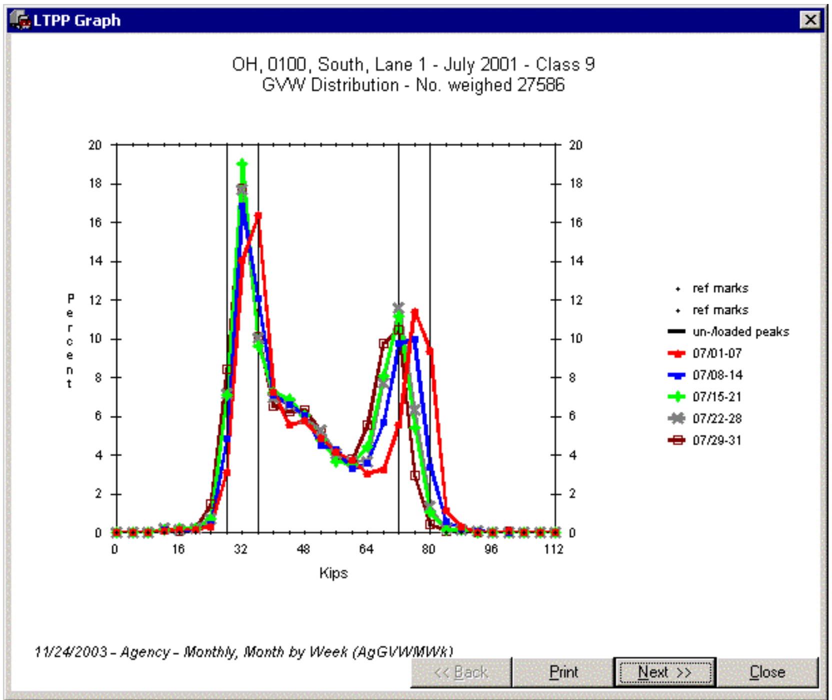


Figure 14-9 Weekly GVW Distributions while steering axle weights dropped - Summer 2001 for 390100

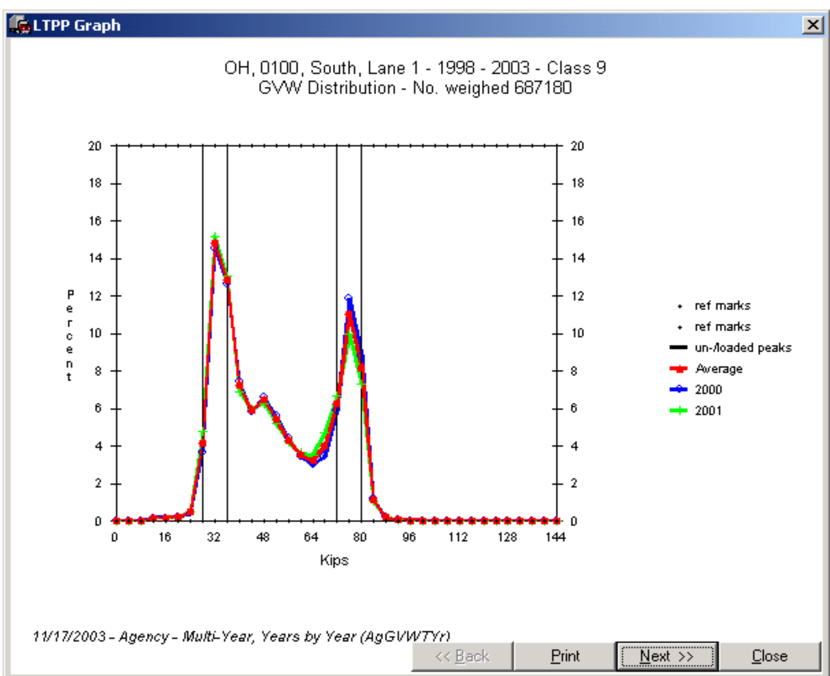


Figure 14-10 Class 9 GVW Distribution - 1998 to 2003 for 390100

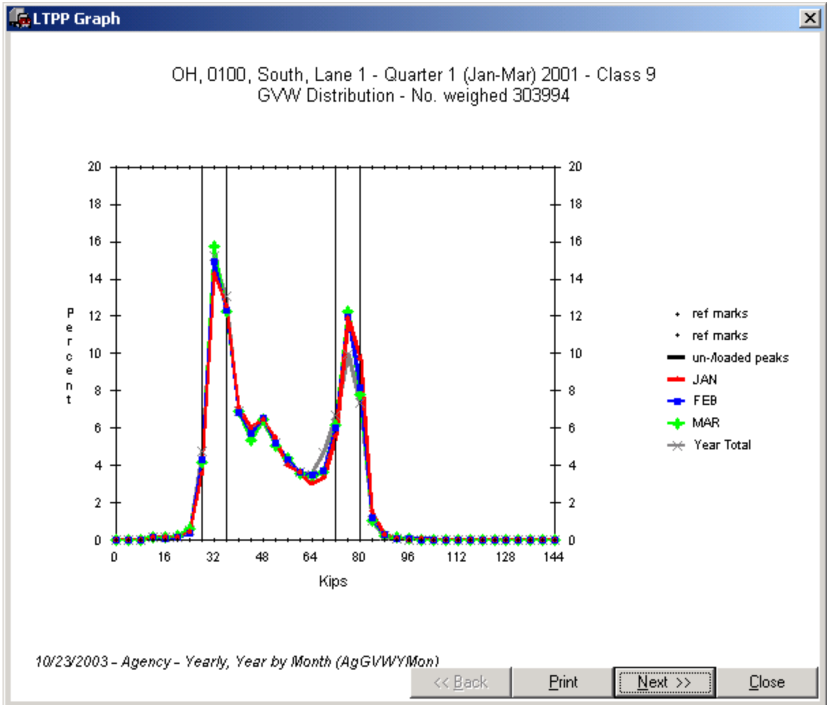


Figure 14-11 Class 9 GVW Distribution - January 2001 to March 2001 for 390100

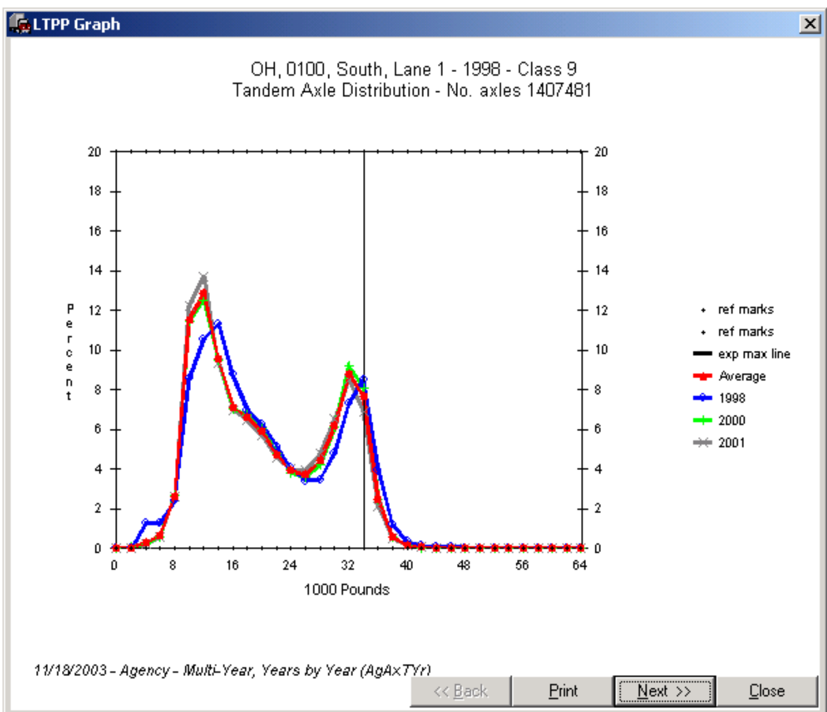


Figure 14-12 Tandem axle distribution from 1998 to 2001 for 390100

15 Corrective Action Illustrations

Figure 15-1 Drainage Culvert at site 390100

HANDOUT GUIDE FOR SPS WIM ASSESSMENT

STATE: Ohio

SHRP ID: 0100

Figures

1. General Information

SITE ID: *390100*
LOCATION: *US 23 SB (Mile Post: 19.7) near Delaware*
VISIT DATE: *November 12, 2003*
VISIT TYPE**:** *Assessment*

2. Contact Information

POINTS OF CONTACT:

Assessment Team: *Dean J. Wolf, 301-210-5105, djwolf@mactec.com*

Highway Agency: *Steven Jessberger, 614-752-4057, steven.jessberger@dot.state.oh.us*

Roger Green, 614-995-5993, roger.green@dot.state.oh.us

FHWA COTR: *Debbie Walker, 202-493-3068, deborah.walker@fhwa.dot.gov*

FHWA Division Office Liaison: *Herman Rodrigo, 614-280-6850, herman.rodrigo@fhwa.dot.gov*

LTPP SPS WIM WEB PAGE: *http://www.tfhrc.gov/pavement/ltpp/spstraffic/index.htm*

3. Agenda

BRIEFING DATE: *November 12, 2003, 8:00 a.m. at Ohio DOT District 6 Office, 400 East Williams Street (US 36), Delaware, OH 43015 – Wilderness Room - Contact Sherri Tobias on 740-363-1251 ext: 231*

ONSITE PERIOD: *November 12, 2003*

TRUCK ROUTE CHECK: *Done (See Truck Route)*

4. Site Location/ Directions

NEAREST AIRPORT: *Port Columbus International Airport, Columbus, OH*

DIRECTIONS TO THE SITE: *7.6 miles North of SR 37*

MEETING LOCATION: *District 6 Headquarters, 400 East Williams Street, Delaware, OH 43015 on November 12, 2003, 8:00 a.m. – Wilderness Room - Contact Sherri Tobias on 740-363-1251 ext: 231*

WIM SITE LOCATION: *US 23 (Milepost 19.7)*

WIM SITE LOCATION MAP:*See Figure 4.1*

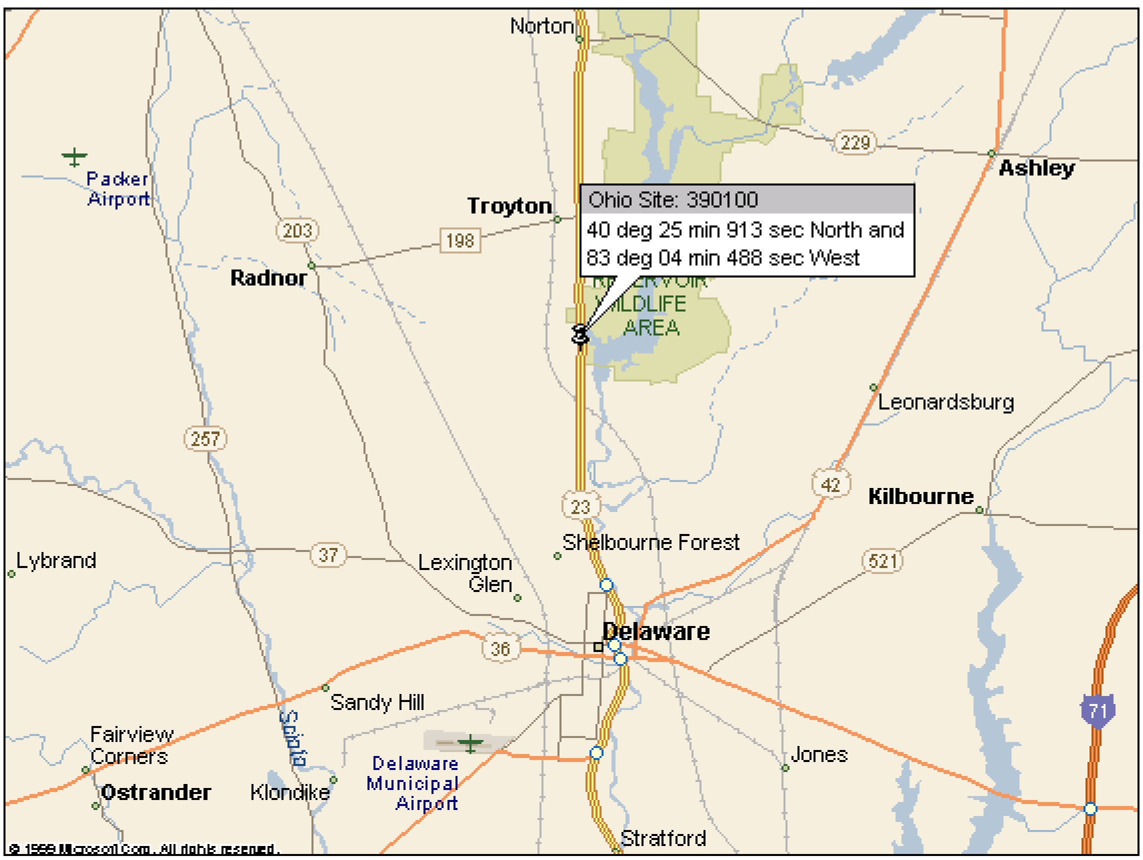


Figure: 4.1 Section 390100 near Delaware, Ohio

5. Truck Route Information

ROUTE RESTRICTIONS: *None*

SCALE LOCATION: *Pilot Travel Center, I-70 and Wilson Road Intersection, Exit 94. Phone: 614-308-9195. Cost is $8 per run. Open 24 Hours*

TRUCK ROUTE:

- *Northbound Turnaround –1.678 miles from site at SR 229 (40^0 26' 035" North and 83^0 04' 363" West)*
- *Southbound Turnaround –1.424 miles from site at Irwin Road (40^0 23' 356" North and 83^0 04' 459" West)*

6. Sheet 17 – Ohio (390100)

1.* ROUTE ___US 23____MILEPOST ___19.7_LTPP DIRECTION - N S E W

2.* WIM SITE DESCRIPTION - Grade ____<1____ % Sag vertical Y / N
Nearest SPS section upstream of the site _0__ _1__ _6__ _1__
Distance from sensor to nearest upstream SPS Section ___ _3__ _1__ _2__ ft

3.* LANE CONFIGURATION
Lanes in LTPP direction __2__ Lane width _1_ _2_ ft

Median -
1 – painted
2 – physical barrier
3 – grass
4 – none

Shoulder -
1 – curb and gutter
2 – paved AC
3 – paved PCC
4 – unpaved
5 – none

Shoulder width _1_ _0__ ft

4.* PAVEMENT TYPE ___________Cement Concrete______________

5.* PAVEMENT SURFACE CONDITION – Distress Survey
Date ______11-12-03________________________ Distress Map ~~Filename~~ Photo __
Downstream_1_TO_1_6A_39_0100_11_12_03.JPG _______________
Date ______11-12-03________________________ Distress Map ~~Filename~~ Photo _
Upstream_TO_1_6A_39_0100_11_12_03.JPG ________________
Date ______11-12-03________________________ Distress Map ~~Filename~~ Photo
____

6. * SENSOR SEQUENCE ___________Loop-Load Cell-Staggered in wheel path__

7. * REPLACEMENT AND/OR GRINDING __ __ __ / __ __ / __ __ __ __
REPLACEMENT AND/OR GRINDING __ __ __ / __ __ / __ __ __ __
REPLACEMENT AND/OR GRINDING __ __ __ / __ __ / __ __ __ __

8. RAMPS OR INTERSECTIONS
Intersection/driveway within 300 m upstream of sensor location Y / N
distance __________
Intersection/driveway within 300 m downstream of sensor location Y / N
distance __________
Is shoulder routinely used for turns or passing? Y / N

9. DRAINAGE (*Bending plate and load cell systems only)*
1 – Open to ground
2 – Pipe to culvert
3 – None

Clearance under plate ___ _6__. _0__ in
Clearance/access to flush fines from under system Y / N

10. * CABINET LOCATION

Same side of road as LTPP lane Y / N Median Y/ N Behind barrier Y / N

Distance from edge of traveled lane _2_ _5_ ft

Distance from system __ __ __ ft

TYPE _____Mettler - Toledo______________________

CABINET ACCESS controlled by LTPP / STATE / JOINT ?

Contact - name and phone number ___Steven Jessberger 614-752-4057

Alternate - name and phone number Dave Gardner 614-752-5740

11. * POWER

Distance to cabinet from drop ___ _1__ _0__ ft Overhead / underground / solar / AC in cabinet?

Service provider __Amer. Elec. Power____________ Phone number ______________________

12. * TELEPHONE

Distance to cabinet from drop _6__ _5__ _0__ ft Overhead / under ground / cell?

Service provider ____Verizon_________________ Phone Number ______________________

13.* SYSTEM (software & version no.)- ___________Mettler - Toledo_____

Computer connection – RS232 / Parallel port / USB / Other ____________________

14. * TEST TRUCK TURNAROUND time __10_____ minutes DISTANCE _6.2__ mi.

15. PHOTOS FILENAME

Power source	________________________
Phone source	_ Phone_Pedestal_1_TO_1_6A_39_0100_11_12_03.JPG
Cabinet exterior	_Cabinet_Exterior_1_TO_1_6A_39_0100_11_12_03.JPG _
Cabinet interior	_Cabinet_Interior_1_TO_1_6A_39_0100_11_12_03.JPG ___
Weight sensors	_ Weigh_Sensor_TO_1_6A_39_0100_11_12_03.JPG _________
Classification sensors	__ Loop_Sensor_TO_1_6A_39_0100_11_12_03.JPG ______
Other sensors	________________________

Description _______________________________

Downstream direction at sensors on LTPP lane

Downstream_1_TO_1_6A_39_0100_11_12_03.JPG ____________________

Upstream direction at sensors on LTPP lane

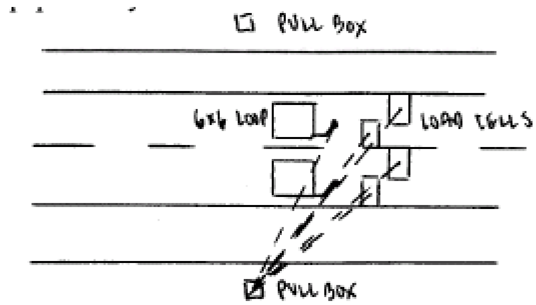
Upstream_TO_1_6A_39_0100_11_12_03.JPG ____________________

COMMENTS ____
___________GPS Coordinates of site: 40^0 25’ 913” North and 83^0 04’ 488” West______
____
Amenities__5.5_miles_south_of_site____
__________Food_-Wendy’s & McDonalds_____________________________________
__________Gas_-_Citgo, Sunoco, mini-mart__________________________________
__________Miscelleaneous_-_84 Lumber_____________________________________
__________Hotel_-_Travel Lodge ____
____
__________10.0_miles south of site____
__________Food_-_Damon’s, Wendy’s, Taco Bell, Kroger’s______________________
__________Hotel_-_Super 8, Ameri Host_____________________________________
__________Miscellaneous_- Banks, Wal-Mart, Sears Hardware____________________
____
____
____
____
____
____
____
____

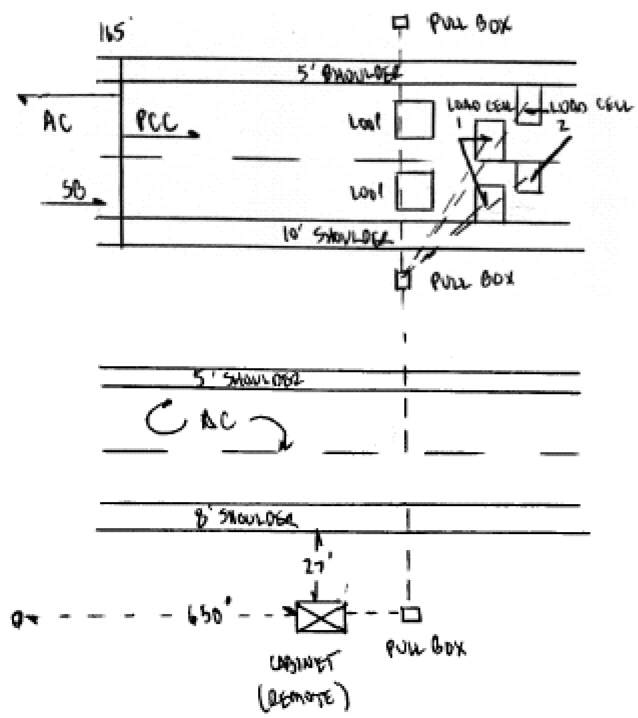
COMPLETED BY ____Dean J. Wolf___________________________

PHONE ___301-210-5105_______DATE COMPLETED _1_ 1_ /_1_ 3_ / _2_ 0_ 0_ 3_

Sketch of equipment layout



Site Map

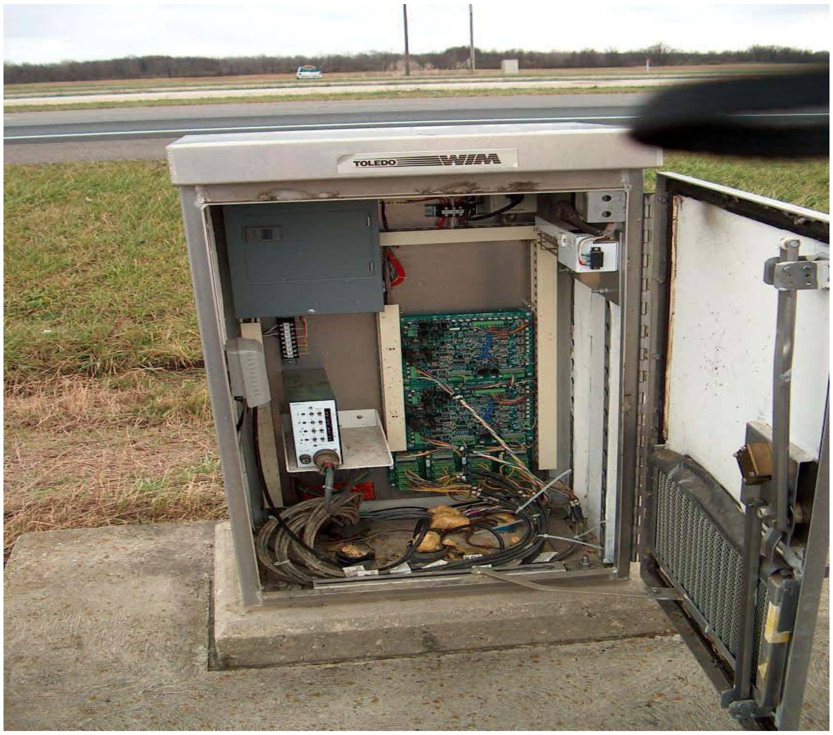


Downstream_1_TO_1_6A_39_0100_11_12_03.JPG (Distress Photo 1)

Upstream_TO_1_6A_39_0100_11_12_03.JPG (Distress Photo 2)

Phone_Pedestal_1_TO_1_6A_39_0100_11_12_03.JPG


Cabinet_Exterior_1_TO_1_6A_39_0100_11_12_03.JPG



Cabinet_Interior_1_TO_1_6A_39_0100_11_12_03.JPG


Weigh_Sensor_TO_1_6A_39_0100_11_12_03.JPG

Loop_Sensor_TO_1_6A_39_0100_11_12_03.JPG

Downstream_1_TO_1_6A_39_0100_11_12_03.JPG

Upstream_TO_1_6A_39_0100_11_12_03.JPG

Sheet 18
LTPP Traffic Data
WIM SITE COORDINATION

STATE_CODE ~~29~~ 39

SPS Project_ID 0 1 0 0

1. Equipment –
   - Maintenance – contract with purchase / separate contract LTPP / separate contract State / state personnel
     Contact STEVEN JESSBERGER 614-752-4057
   - Purchase by LTPP / State
     Constraints on specifications (sensor, electronics, warranties, maintenance, installation)

     Installation – Included with purchase / separate contract by State / state personnel / LTPP contract

     Calibration – Vendor / State / LTPP

     Manuals and software – State / LTPP

     Pavement PCC/AC – always new / replacement as needed / grinding and maintenance as needed / maintenance only / no remediation

     Power - overhead / underground / solar — billed to State / LTPP / N/A

     Communication – Landline / Cellular / Other — billed to State / LTPP / N/A

2. Site visits – Evaluation

   WIM Validation Check - advance notice required 14 days / weeks

Trucks – air suspension 3S2	State / LTPP
2nd common	State / LTPP
3rd common	State / LTPP
4th common	State / LTPP
Loads	State / LTPP

Contact ______________________

Drivers — State / LTPP

Contact ______________________

Contractors with prior successful experience in WIM calibration in state:

____

Nearest static scale (commercial or enforcement)

____

Profiling – short wave – permanent / temporary site marking
-- long wave – permanent / temporary site marking

39

Sheet 18
LTPP Traffic Data
WIM SITE COORDINATION

STATE_CODE 04

SPS Project_ID 0100

Pre-visit data
– Classification and speed: Contact STEVEN JESSBERGER
--Typical operating conditions (congestion, high truck volumes)
Contact STEVEN JESSBERGER
-- Equipment operational status: Contact STEVEN JESSBERGER

Access to cabinet
State only / Joint / LTPP   Key / Combination

- State personnel required on site Y / N
Contact information STEVEN JESSBERGER

- Enforcement Coordination required Y / N
Contact information

- Traffic Control Required Y/N
Contact information

Maximum number of personnel on site 4 ;
Invitees

Authorization to calibrate site -- State only / LTPP

Special conditions

3. Data Processing
- Down load   State only / LTPP read only / LTPP download / LTPP download and copy to state
- Data Review   State per LTPP guidelines / State weekly / LTPP
- Data submission for QC   State - weekly; twice a month; monthly / LTPP

4. Site visits – Validation

WIM Validation Check - advance notice required 14 days / weeks
LTPP Semi-annually / Sate per LTPP protocol semi-annually / State other

Trucks – air suspension 3S2	State / LTPP
2nd common	State / LTPP
3rd common	State / LTPP
4th common	State / LTPP
Loads	State / LTPP

Contact

Drivers   State / LTPP

Sheet 18
LTPP Traffic Data
WIM SITE COORDINATION

STATE_CODE ~~04~~ 39

SPS Project_ID 0 1 0 0

Contact ______________________

Contractors with prior successful experience in WIM calibration in state:

____

Profiling – short wave -- permanent / temporary site marking
-- long wave – permanent / temporary site marking

Pre-visit data
– Classification and speed: Contact STEVEN JESSBERGER
-- Equipment operational status: Contact STEVEN JESSBERGER

Access to cabinet
State only / Joint / LTPP Key / Combination

- State personnel required on site Y / N
Contact information STEVEN JESSBERGER

- Enforcement Coordination required Y / N
Contact information ______________________

- Traffic Control Required Y / N
Contact information ______________________

Authorization to calibrate site -- State only / LTPP

Special conditions ______________________

5. Site visit – Construction

Construction schedule and verification – Contact ______________________

- Notice for straightedge and grinding check - _____ days / weeks
On site lead to direct / accept grinding – State / LTPP

WIM Calibration - advance notice required ____ days / weeks
Number of lanes -- ______
LTPP / State per LTPP protocol / State Other ______________

Trucks – air suspension 3S2 State / LTPP
2nd common State / LTPP
Loads State / LTPP
Drivers State / LTPP

Contractors with prior successful experience in WIM calibration in state:

WIM SITE COORDINATION

STATE_CODE 39

SPS Project_ID 01 00

Profiling – straight edge -- permanent / temporary site marking
-- long wave – permanent / temporary site marking

Pre-visit data
– Classification and speed: Contact ______________________
-- Equipment operational status: Contact ______________________

Access to cabinet
State only / Joint / LTPP Key / Combination

- State personnel required on site Y / N
Contact information ______________________

- Enforcement Coordination required Y / N
Contact information ______________________

- Traffic Control Required Y/ N
Contact information ______________________

Authorization to calibrate site -- State only / LTPP

Special conditions ______________________

6. Special conditions
   - Funds and accountability
   - Reports
   - Other