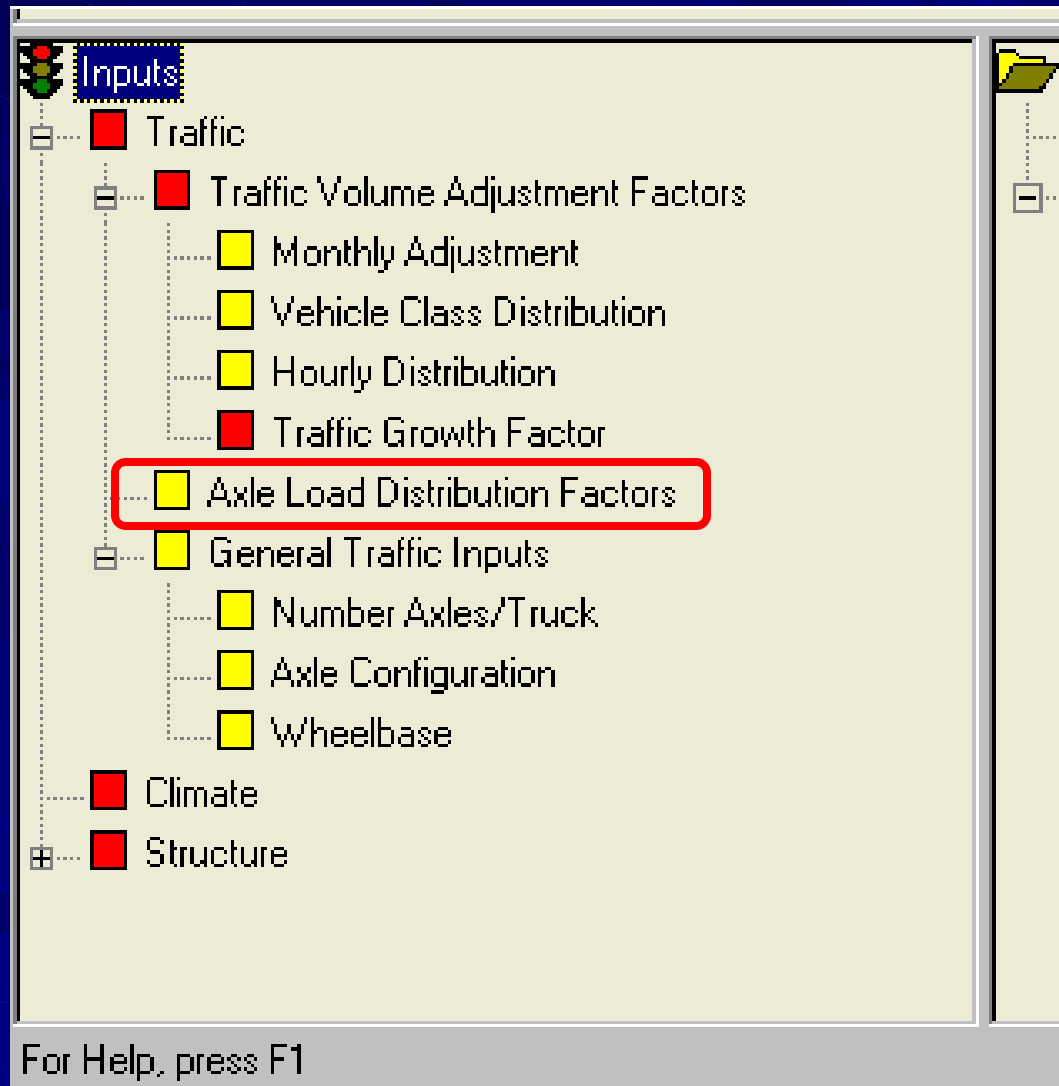
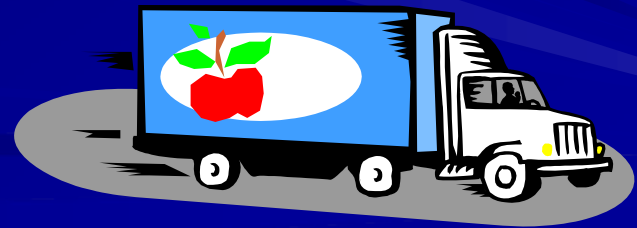
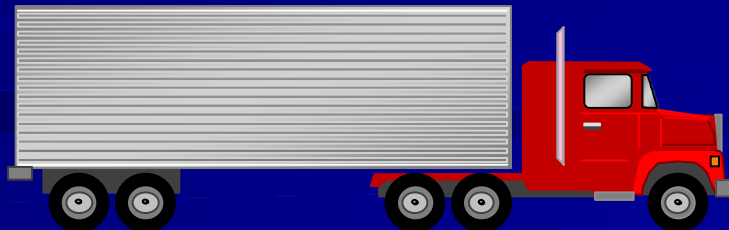
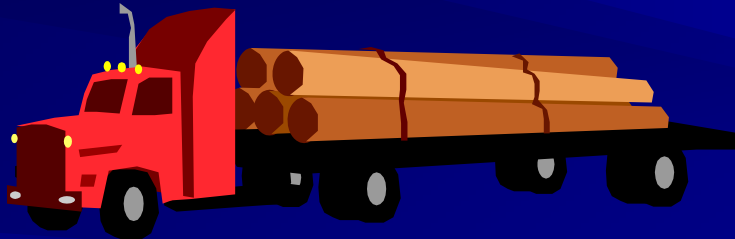
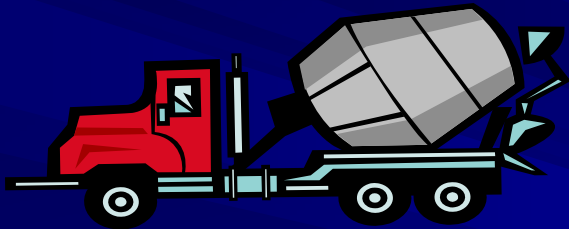
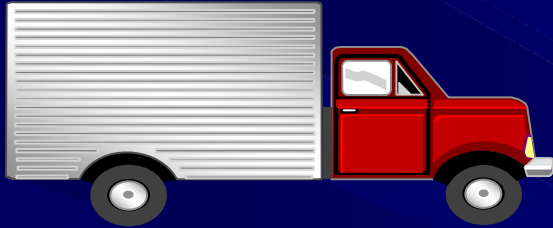
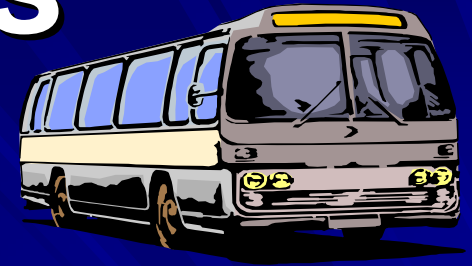


**Implementing  
MEPDG in Florida  
June 23<sup>rd</sup>, 2010  
Cunagin and Reel**

# Traffic Inputs



# Traffic inputs



Number of axles by:

- Axle type
- Truck type
- Axle load interval

# MEPDG Axle Load Input screen

**Axle Load Distribution Factors** [?] [X]

**Axle Load Distribution**

Level 1: Site Specific  Level 2: Regional  Level 3: Default

Export Axle File

Open Axle File

**View**

Cumulative Distribution  Distribution

View Plot

**Axle Types**

Single Axle  Tandem Axle  Tridem Axle  Quad Axle

**Axle Factors by Axle Type**

	Season	Vel. Class	Total	3000	4000	5000	6000	7000
	January	4	100.00	1.8	0.96	2.91	3.99	6.8
	January	5	100.00	10.05	13.21	16.42	10.61	9.22
	January	6	100.00	2.47	1.78	3.46	3.95	6.7
	January	7	100.00	2.14	0.55	2.42	2.7	3.21
	January	8	100.00	11.65	5.37	7.84	6.99	7.99
	January	9	100.00	1.74	1.37	2.84	3.53	4.93
	January	10	100.00	3.64	1.24	2.36	3.38	5.18
	January	11	100.00	3.55	2.91	5.19	5.27	6.32
	January	12	100.00	6.68	2.29	4.87	5.86	5.97
	January	13	100.00	8.88	2.67	3.81	5.23	6.03
	February	4	100.00	1.8	0.96	2.91	3.99	6.8

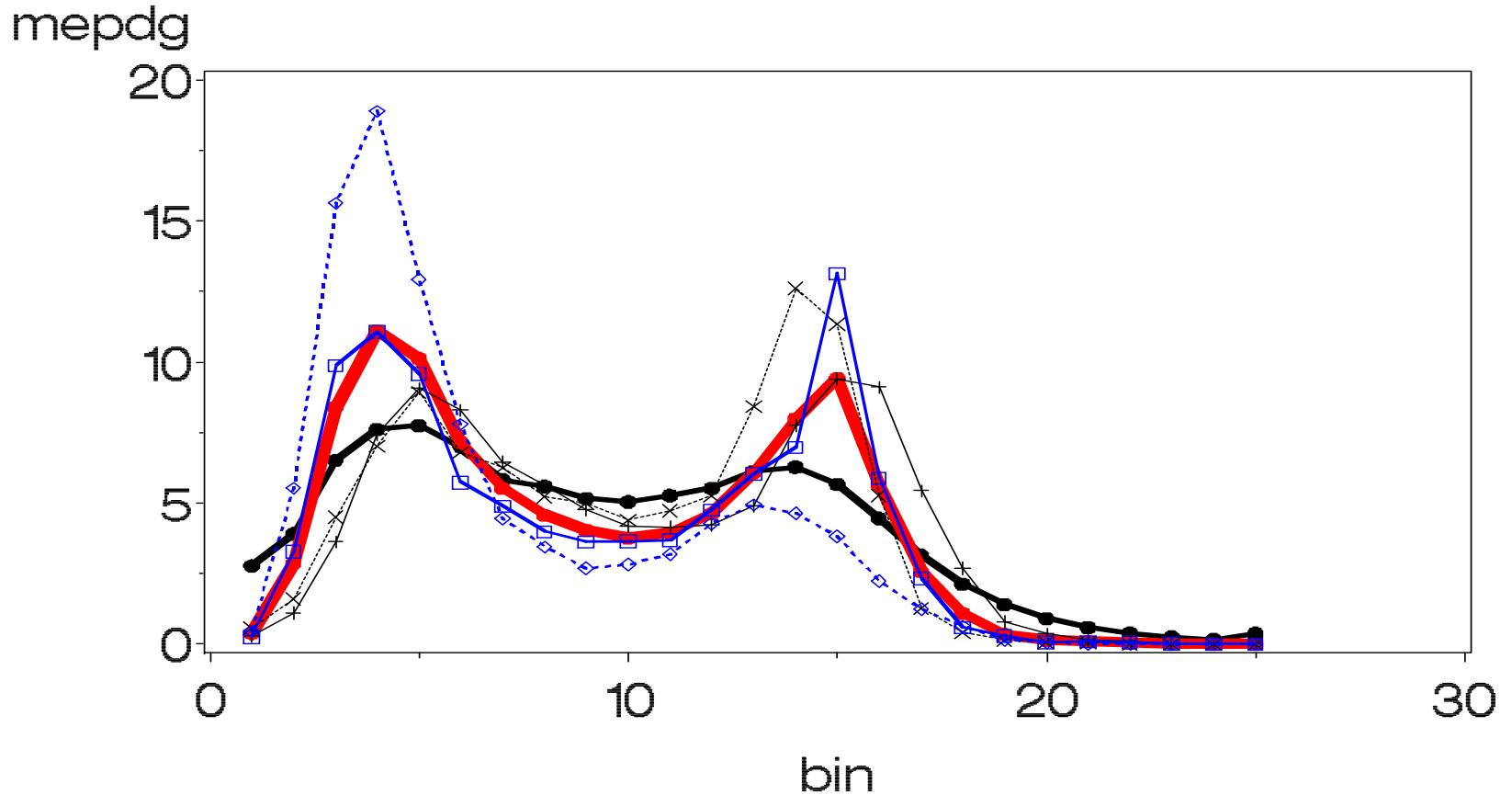
OK Cancel

# **Phase I of Florida MEPDG Traffic Study**

**Site Specific (Level 1) Development  
of Axle Load Distribution Files**

# **WHY?**

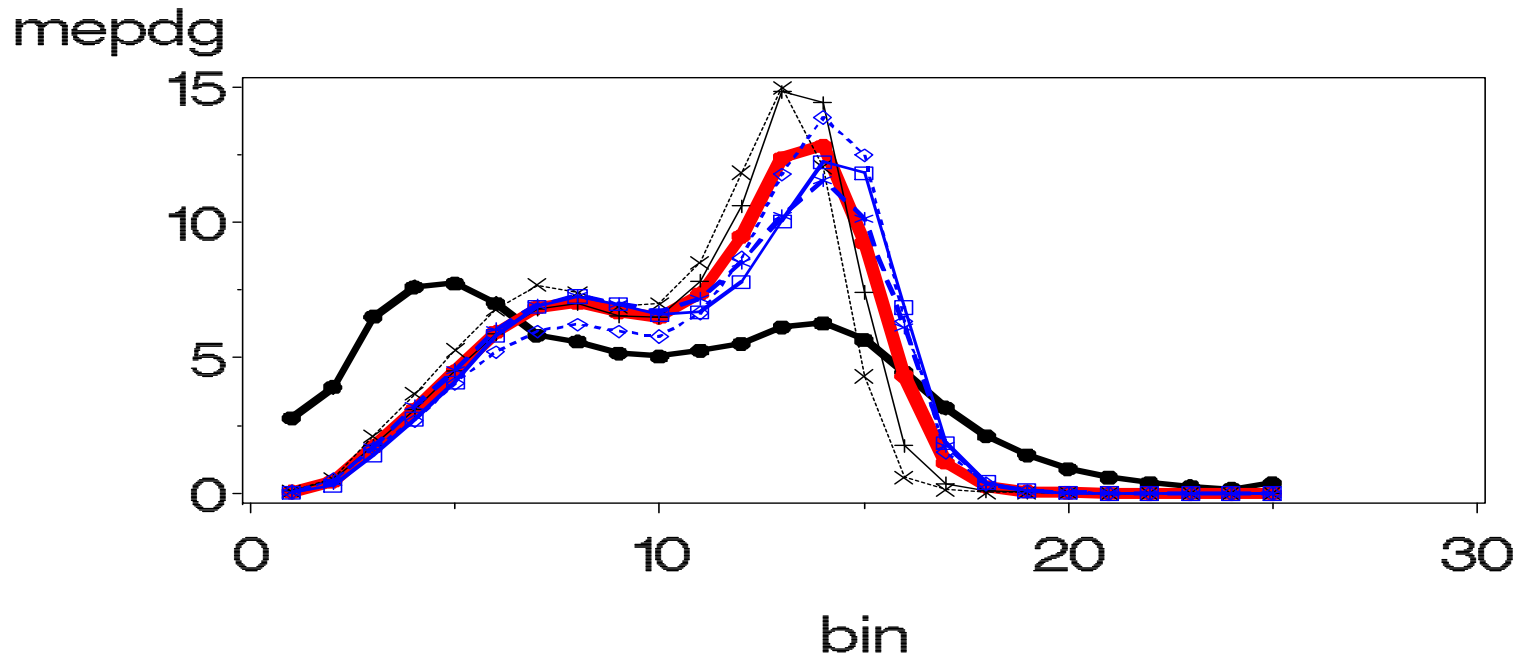
# Annual Axle Load Spectra for Site 9926 Lane 2 Vehicle Class 9 Tandem



PLOT

●-●-●	mepdg	●-●-●	annual_m_of_m
+--+	annualMean2005	*-*-*	annualMean2006
*-*-*	annualMean2007	□-□-□	annualMean2008
◇-◇-◇	annualMean2009		

# Annual Axle Load Spectra for Site 9901 Lane 1 Vehicle Class 9 Tandem



- PLOT
- mepdg
  - annual\_m\_of\_m
  - +--+ annualMean2005
  - ×-×-× annualMean2006
  - \*-\*-\* annualMean2007
  - annualMean2008
  - ◇-◇-◇ annualMean2009

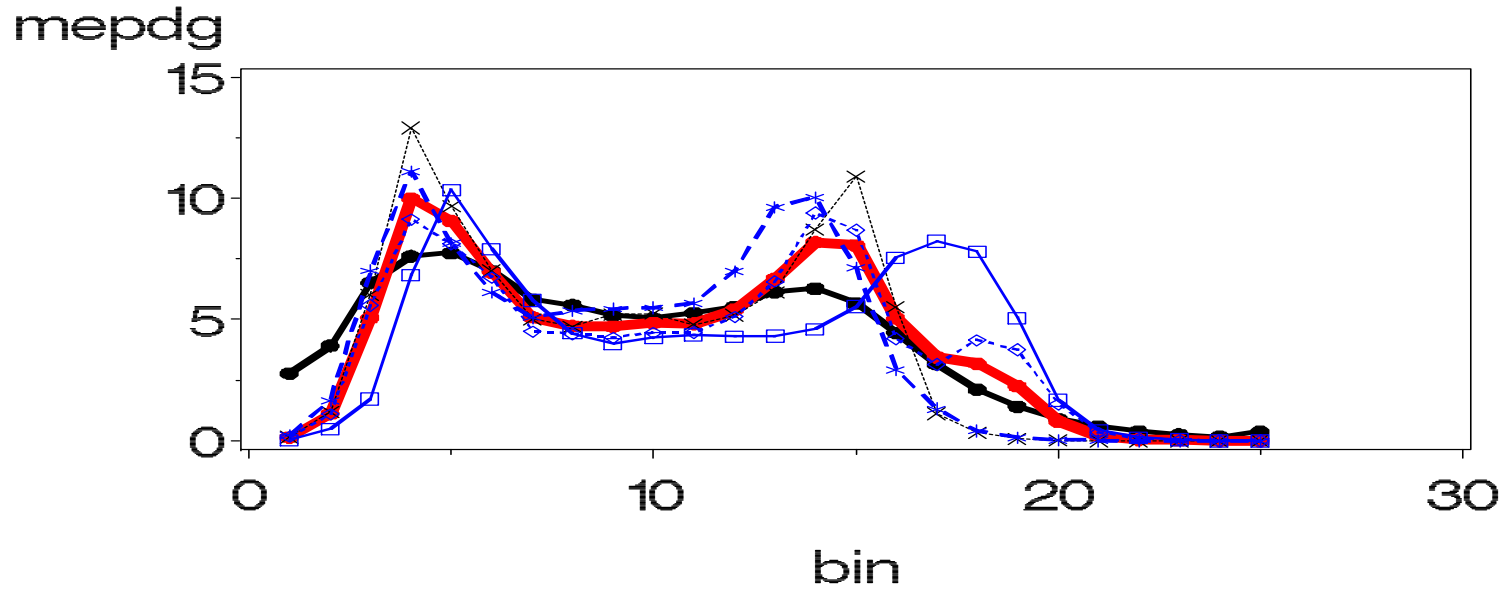
# Subtasks

- Evaluate Florida archived data
- Develop processes to handle:
  - Multiple Lanes of data
  - Multiple Days of data
  - Multiple Years of data
- Produce Level 1 MEPDG Axle Load Spectra data



# I-75, NB

Annual Axle Load Spectra for Site 9904 Lane 1 Vehicle Class 9 Tandem

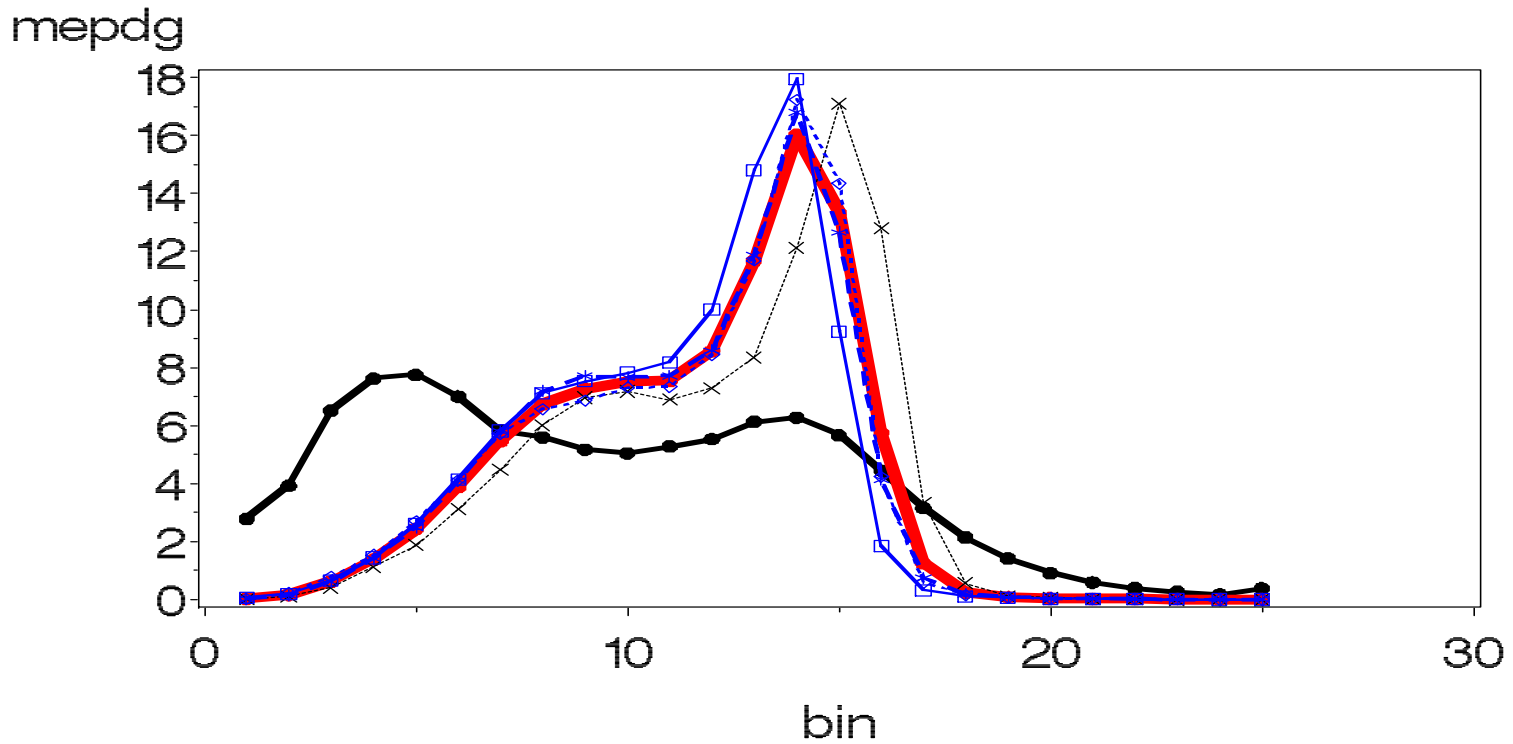


PLOT

- mepdg
- annual\_m\_of\_m
- +--+ annualMean2005
- ×-×-× annualMean2006
- \*-\*-\* annualMean2007
- annualMean2008
- ◇-◇-◇ annualMean2009

# I-75, SB

Annual Axle Load Spectra for Site 9904 Lane 6 Vehicle Class 9 Tandem



PLOT

- mepdg
- +++ annualMean2005
- \*-\*-\* annualMean2006
- ◆◆◆ annualMean2007
- ◆◆◆ annualMean2008
- ◆◆◆ annualMean2009

# Data Availability

■ 2001 – 2009

■ In excess of 50 million records

2001	4,979,961
2002	3,239,825
2003	4,496,894
2004	6,139,905
2005	6,657,530
2006	7,936,707
2007	7,289,099
2008	6,855,296
2009	8,418,714

# Data Used

■ 2005 – 2009

■ More than 35 Million records

<b>2005</b>	<b>6,657,530</b>
<b>2006</b>	<b>7,936,707</b>
<b>2007</b>	<b>7,289,099</b>
<b>2008</b>	<b>6,855,296</b>
<b>2009</b>	<b>8,418,714</b>

# WHY?

- Moving 5 year average
- Can be reviewed and updated annually
- More recent data is of the highest quality

# Analysis

## ■ SAS

- >20,000 lines of code


















## ■ Day-of-Week

- By Month
- By Year
- By Vehicle Type

## ■ Combined Years

- By Day-of-Week
- By Month

# FHWA CLASSIFICATION SCHEME "F"

CLASS GROUP	DESCRIPTION	NO. OF AXLES
1	 MOTORCYCLES	2
2	 ALL CARS	2
	 CARS W/ 1-AXLE TRAILER	3
	 CARS W/ 2-AXLE TRAILER	4
3	 PICK-UPS & VANS 1 & 2 AXLE TRAILERS	2, 3, & 4
4	 BUSES	2 & 3
5	 2-AXLE, SINGLE UNIT	2
6	 3-AXLE, SINGLE UNIT	3
7	 4-AXLE, SINGLE UNIT	4
8	 2-AXLE, TRACTOR, 1-AXLE TRAILER (2S1)	3
	 2-AXLE, TRACTOR, 2-AXLE TRAILER (2S2)	4
	 3-AXLE, TRACTOR, 1-AXLE TRAILER (3S1)	4
9	 3-AXLE, TRACTOR, 2-AXLE TRAILER (3S2)	5
	 3-AXLE, TRUCK, W/ 2-AXLE TRAILER	5
10	 TRACTOR W/ SINGLE TRAILER	6 & 7
11	 5-AXLE MULTI-TRAILER	5
12	 6-AXLE MULTI-TRAILER	6
13	ANY 7 OR MORE AXLE	7 or more
14	NOT USED	
15	UNKNOWN VEHICLE TYPE	





Single Axle



Tandem Axle



Tridem Axle



Quad Axle

# FDOT vs. FHWA Load Bins

SINGLE AXLES					
BIN	FHWA		FDOT		
	Min	Max	Min	0	Max
1	3000	4000		0	4000
2	4000	5000	4001		5000
3	5000	6000	5001		6000
4	6000	7000	6001		7000
5	7000	8000	7001		8000
6	8000	9000	8001		9000
7	9000	10000	9001		10000
8	10000	11000	10001		11000
9	11000	12000	11001		12000
10	12000	13000	12001		13000
11	13000	14000	13001		14000
12	14000	15000	14001		15000
13	15000	16000	15001		16000
14	16000	17000	16001		17000
15	17000	18000	17001		18000
16	18000	19000	18001		19000
17	19000	20000	19001		20000
18	20000	21000	20001		21000
19	21000	22000	21001		22000
20	22000	23000	22001		23000
21	23000	24000	23001		24000
22	24000	25000	24001		25000
23	25000	26000	25001		26000
24	26000	27000	26001		27000
25	27000	28000	27001		36000
26	28000	29000			
27	29000	30000			
28	30000	31000			
29	31000	32000			
30	32000	33000			
31	33000	34000			
32	34000	35000			
33	35000	36000			
34	36000	37000			
35	37000	38000			
36	38000	39000			
37	39000	40000			
38	40000	41000			
39	41000	42000			

TANDEM AXLES					
Bin	FHWA		FDOT		
	Min	Max	Bin	Min	Max
1	6000	8000	2	6001	8000
2	8000	10000	3	8001	10000
3	10000	12000	4	10001	12000
4	12000	14000	5	12001	14000
5	14000	16000	6	14001	16000
6	16000	18000	7	16001	18000
7	18000	20000	8	18001	20000
8	20000	22000	9	20001	22000
9	22000	24000	10	22001	24000
10	24000	26000	11	24001	26000
11	26000	28000	12	26001	28000
12	28000	30000	13	28001	30000
13	30000	32000	14	30001	32000
14	32000	34000	15	32001	34000
15	34000	36000	16	34001	36000
16	36000	38000	17	36001	38000
17	38000	40000	18	38001	40000
18	40000	42000	19	40001	42000
19	42000	44000	20	42001	44000
20	44000	46000	21	44001	46000
21	46000	48000	22	46001	48000
22	48000	50000	23	48001	50000
23	50000	52000	24	50001	52000
24	52000	54000	25	52001	60000
25	54000	56000			
26	56000	58000			
27	58000	60000			
28	60000	62000			
29	62000	64000			
30	64000	66000			
31	66000	68000			
32	68000	70000			
33	70000	72000			
34	72000	74000			
35	74000	76000			
36	76000	78000			
37	78000	80000			
38	80000	82000			
39	82000	84000			

TRIDEM AXLES					
Bin	FHWA		FDOT		
	Min	Max	Bin	Min	Max
1	12000	15000	2	12001	15000
2	15000	18000	3	15001	18000
3	18000	21000	4	18001	21000
4	21000	24000	5	21001	24000
5	24000	27000	6	24001	27000
6	27000	30000	7	27001	30000
7	30000	33000	8	30001	33000
8	33000	36000	9	33001	36000
9	36000	39000	10	36001	39000
10	39000	42000	11	39001	42000
11	42000	45000	12	42001	45000
12	45000	48000	13	45001	48000
13	48000	51000	14	48001	51000
14	51000	54000	15	51001	54000
15	54000	57000	16	54001	57000
16	57000	60000	17	57001	60000
17	60000	63000	18	60001	63000
18	63000	66000	19	63001	66000
19	66000	69000	20	66001	69000
20	69000	72000	21	69001	72000
21	72000	75000	22	72001	75000
22	75000	78000	23	75001	78000
23	78000	81000	24	78001	81000
24	81000	84000	25	81001	92000
25	84000	87000			
26	87000	90000			
27	90000	93000			
28	93000	96000			
29	96000	99000			
30	99000	102000			
31	102000	105000			

QUAD AXLES					
Bin	FHWA		FDOT		
	Min	Max	Bin	Min	Max
1	12000	15000	1	0	16000
2	15000	18000			
3	18000	21000	2	16001	20000
4	21000	24000	3	20001	24000
5	24000	27000	4	24001	28000
6	27000	30000			
7	30000	33000	5	28001	32000
8	33000	36000	6	32001	36000
9	36000	39000	7	36001	40000
10	39000	42000			
11	42000	45000	8	40001	44000
12	45000	48000	9	44001	48000
13	48000	51000	10	48001	52000
14	51000	54000			
15	54000	57000	11	52001	56000
16	57000	60000	12	56001	60000
17	60000	63000	13	60001	64000
18	63000	66000			
19	66000	69000	14	64001	68000
20	69000	72000	15	68001	72000
21	72000	75000	16	72001	76000
22	75000	78000			
23	78000	81000	17	76001	80000
24	81000	84000	18	80001	84000
25	84000	87000	19	84001	88000
26	87000	90000	20	88001	92000
27	90000	93000			
28	93000	96000	21	92001	96000
29	96000	99000	22	96001	100000
30	99000	102000	23	100001	104000
31	102000	105000	24	104001	108000
			25	108001	112000



# Quadruple Axles

- Added in 2004
- Very few records
  - 19,738 of 37,157,346
  - 0.05%
- Mostly on Interstate and Turnpike
  - 180 records max in a single lane

# Decision Criteria

- Insufficient Data
  - <100 vehicles/year
- Annual Factors Only
  - >100 but <1200 vehicles/year
- Monthly Factors
  - >100 vehicles/month

# Data Availability

Spectra Types for Site 9901

site	month	veh_class	daytotal	monthtotal	yeartotal	spectratype
9901	January	4	20	587	7147	Monthly
9901	February	4	20	605	7355	Monthly
9901	March	4	21	637	7753	Monthly
9901	April	4	21	638	7761	Monthly
9901	May	4	17	498	6057	Monthly
9901	June	4	17	503	6114	Monthly
9901	July	4	12	355	4314	Monthly
9901	August	4	12	347	4216	Monthly
9901	September	4	14	416	5063	Monthly
9901	October	4	14	426	5179	Monthly
9901	November	4	14	412	5011	Monthly
9901	December	4	12	361	4395	Monthly
9901	January	5	49	1458	17743	Monthly
9901	February	5	54	1625	19765	Monthly
9901	March	5	59	1769	21524	Monthly
9901	April	5	54	1624	19759	Monthly
9901	May	5	47	1397	16991	Monthly
9901	June	5	56	1672	20338	Monthly
9901	July	5	68	2052	24966	Monthly
9901	August	5	60	1807	21988	Monthly
9901	September	5	76	2291	27879	Monthly
9901	October	5	77	2317	28185	Monthly
9901	November	5	70	2103	25583	Monthly
9901	December	5	56	1681	20447	Monthly

9901	January	8	32	954	11607	Monthly
9901	February	8	37	1095	13323	Monthly
9901	March	8	36	1085	13198	Monthly
9901	April	8	39	1157	14071	Monthly
9901	May	8	27	824	10019	Monthly
9901	June	8	25	737	8961	Monthly
9901	July	8	26	781	9505	Monthly
9901	August	8	23	676	8227	Monthly
9901	September	8	26	794	9658	Monthly
9901	October	8	27	815	9910	Monthly
9901	November	8	35	1040	12658	Monthly
9901	December	8	26	773	9410	Monthly
9901	January	9	1069	32063	390105	Monthly
9901	February	9	1093	32777	398781	Monthly
9901	March	9	1132	33963	413220	Monthly
9901	April	9	1120	33614	408972	Monthly
9901	May	9	1015	30442	370380	Monthly
9901	June	9	1101	33021	401756	Monthly
9901	July	9	995	29842	363076	Monthly
9901	August	9	1051	31524	383542	Monthly
9901	September	9	983	29501	358934	Monthly
9901	October	9	1092	32759	398565	Monthly
9901	November	9	1111	33341	405646	Monthly
9901	December	9	1023	30704	373570	Monthly

9901	January	12	7	206	2500	Monthly
9901	February	12	8	228	2768	Monthly
9901	March	12	7	216	2624	Monthly
9901	April	12	7	224	2724	Monthly
9901	May	12	7	223	2712	Monthly
9901	June	12	7	217	2634	Monthly
9901	July	12	7	212	2584	Monthly
9901	August	12	6	186	2267	Monthly
9901	September	12	6	180	2186	Monthly
9901	October	12	8	232	2825	Monthly
9901	November	12	9	269	3278	Monthly
9901	December	12	8	227	2756	Monthly
9901	January	13	1	42	511	Annual
9901	February	13	1	36	438	Annual
9901	March	13	1	42	511	Annual
9901	April	13	2	48	584	Annual
9901	May	13	2	46	560	Annual
9901	June	13	1	36	438	Annual
9901	July	13	1	36	438	Annual
9901	August	13	1	34	408	Annual
9901	September	13	1	38	462	Annual
9901	October	13	1	33	402	Annual
9901	November	13	1	30	365	Annual
9901	December	13	1	42	511	Annual

## Axle Load Distribution Factors



### Axle Load Distribution

- Level 1: Site Specific
- Level 2: Regional
- Level 3: Default

Export Axle File

Open Axle File

### View

- Cumulative Distribution
- Distribution

View Plot

### Axle Types

- Single Axle
- Tandem Axle
- Tridem Axle
- Quad Axle

### Axle Factors by Axle Type

	Season	Veh. Class	Total	3000	4000	5000	6000	7000
	January	4	100.00	1.8	0.96	2.91	3.99	6.8
	January	5	100.00	10.05	13.21	16.42	10.61	9.22
	January	6	100.00	2.47	1.78	3.46	3.95	6.7
	January	7	100.00	2.14	0.55	2.42	2.7	3.21
	January	8	100.00	11.65	5.37	7.84	6.99	7.99
	January	9	100.00	1.74	1.37	2.84	3.53	4.93
	January	10	100.00	3.64	1.24	2.36	3.38	5.18
	January	11	100.00	3.55	2.91	5.19	5.27	6.32
	January	12	100.00	6.68	2.29	4.87	5.86	5.97
	January	13	100.00	8.88	2.67	3.81	5.23	6.03
	February	4	100.00	1.8	0.96	2.91	3.99	6.8

OK

Cancel

# Phase II

- Level 2 (Florida) axle load defaults
- MEPDG uses Truck Traffic Classification (TTC) Groups
- FDOT has used Rural/Urban/Int/NonInt

**QUESTIONS?**