NATMEC

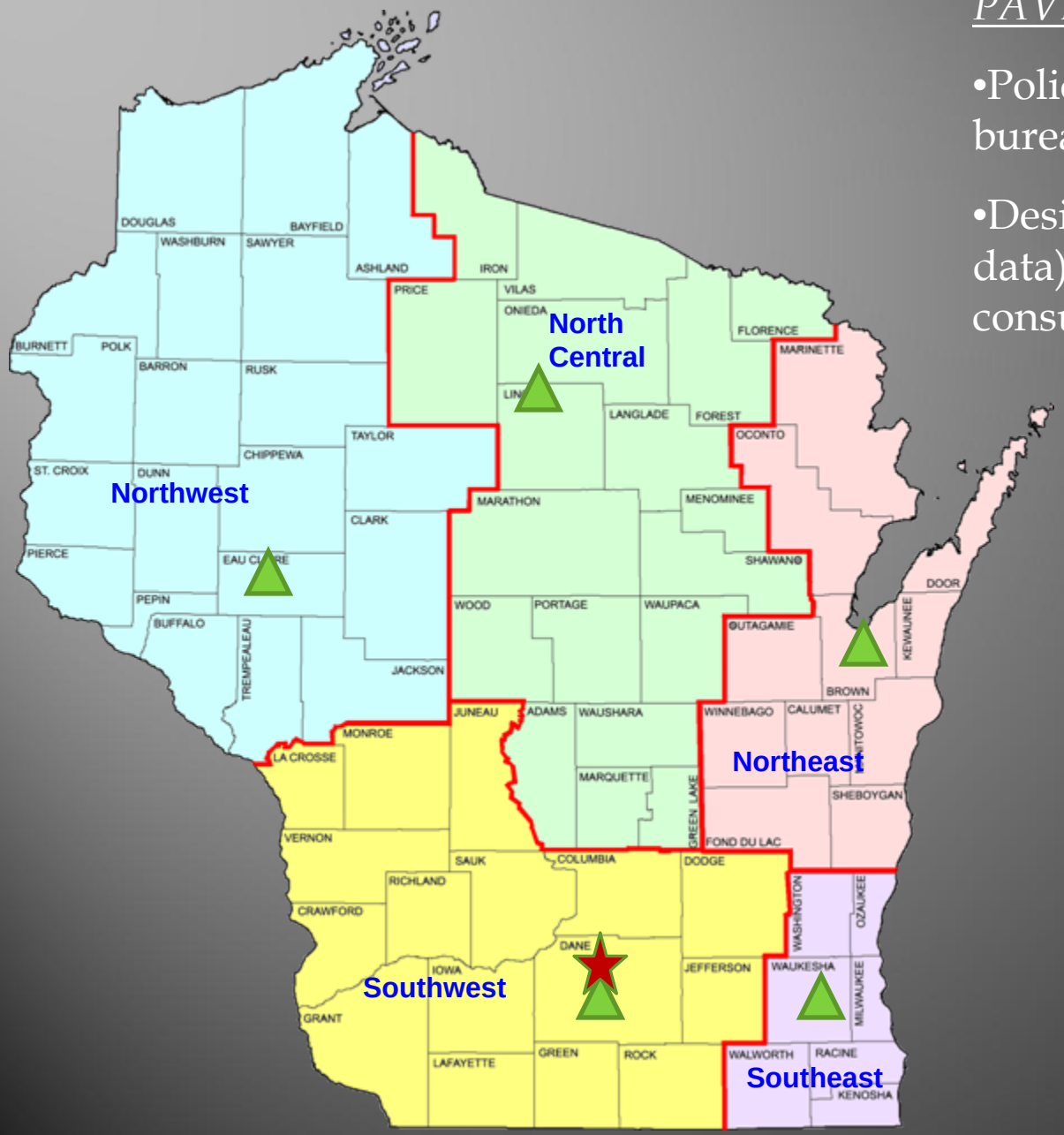
IMPROVING TRAFFIC DATA COLLECTION, ANALYSIS, AND USE

SEATTLE, WA

JUNE 23, 2010

Implementing MEPDG in Wisconsin

Laura L Fenley, PE
Pavement Structure Engineer
Wisconsin Department of Transportation



PAVEMENT DESIGN

- Policy and guidance in statewide bureau
- Designs (primary users of traffic data) done in regions (or by consultants)

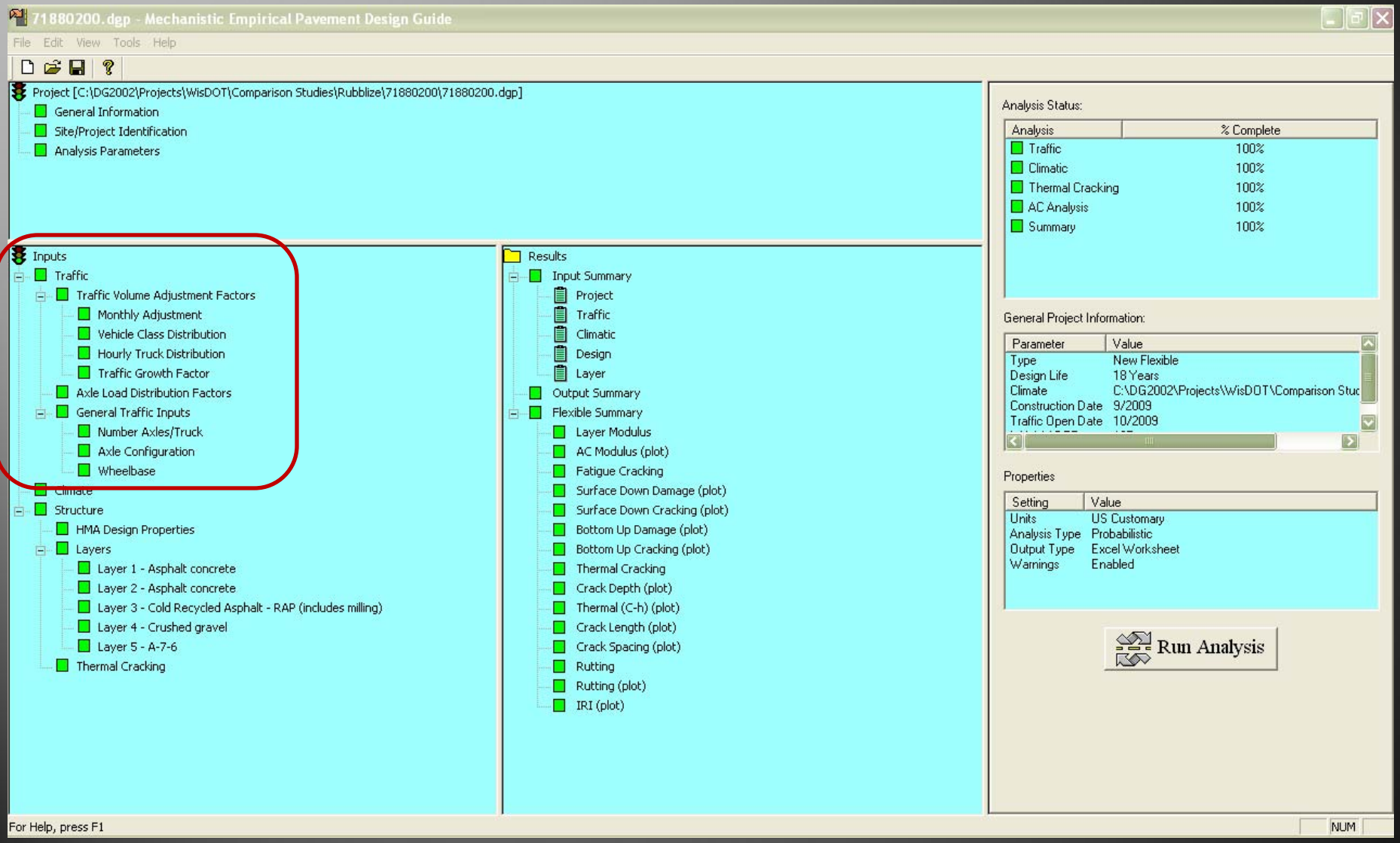
TRAFFIC

- Monitoring and Forecasting in same building, but different sections
- Both in a different division, housed in a building on the opposite side of the city from Pavements

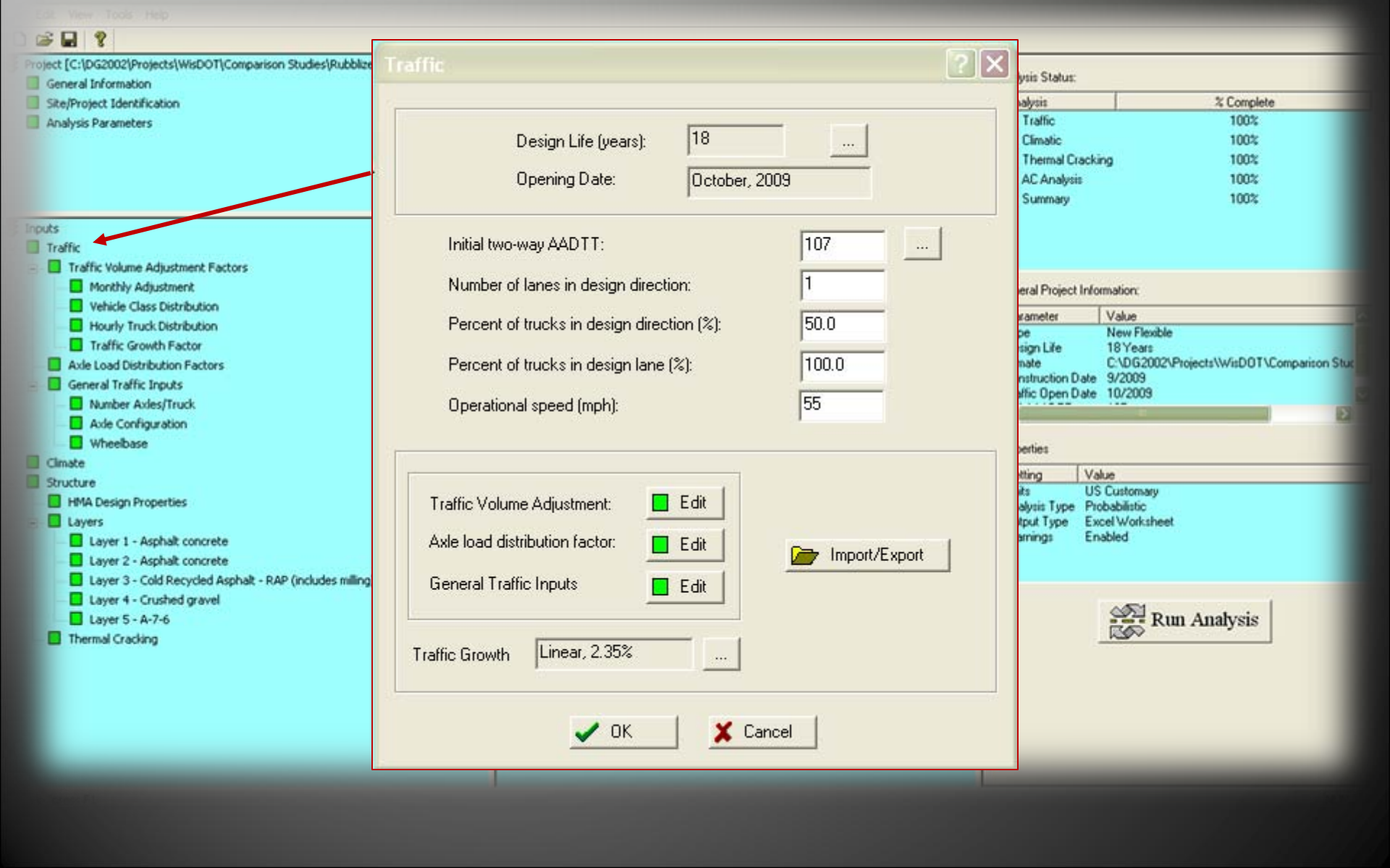
Implementation - Phase I, Traffic

- 2006
- WIMs
  - 15 permanent WIMs
  - 15 portable WIMs
- 43 vehicle classification stations
- Ultimately reviewed data from 21 LTPP sites (14 separate WIMs)

MEPDG Main Input Screen



MEPDG Basic Traffic Input Screen



Traffic Volume Adjustment Factors - Monthly Adjustment Factors

Traffic Volume Adjustment Factors

Monthly Adjustment | Vehicle Class Distribution | Hourly Distribution | Traffic Growth Factors

Load Monthly Adjustment Factors (MAF)

Level 1: Site Specific - MAF

Level 3: Default MAF

Load MAF From File

Export MAF to File

Monthly Adjustment Factors

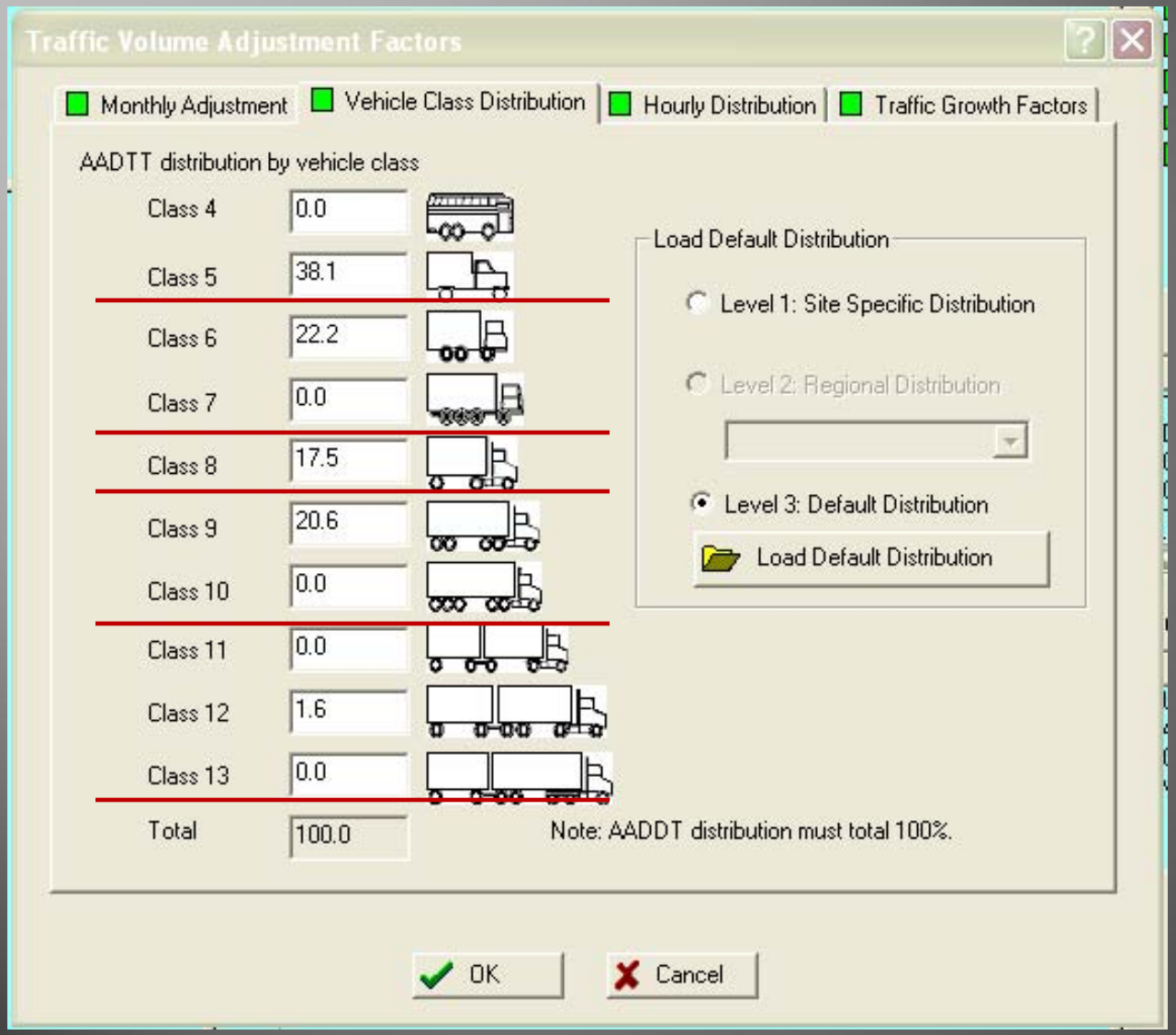
Month	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13
January	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
February	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
March	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
April	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
May	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
June	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
July	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
August	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
September	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
October	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
November	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
December	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

OK | Cancel

- WisDOT does not currently report-out this information. We total by month, but not individual class.
- Default values are recommended at this time.

Honeybee – state insect

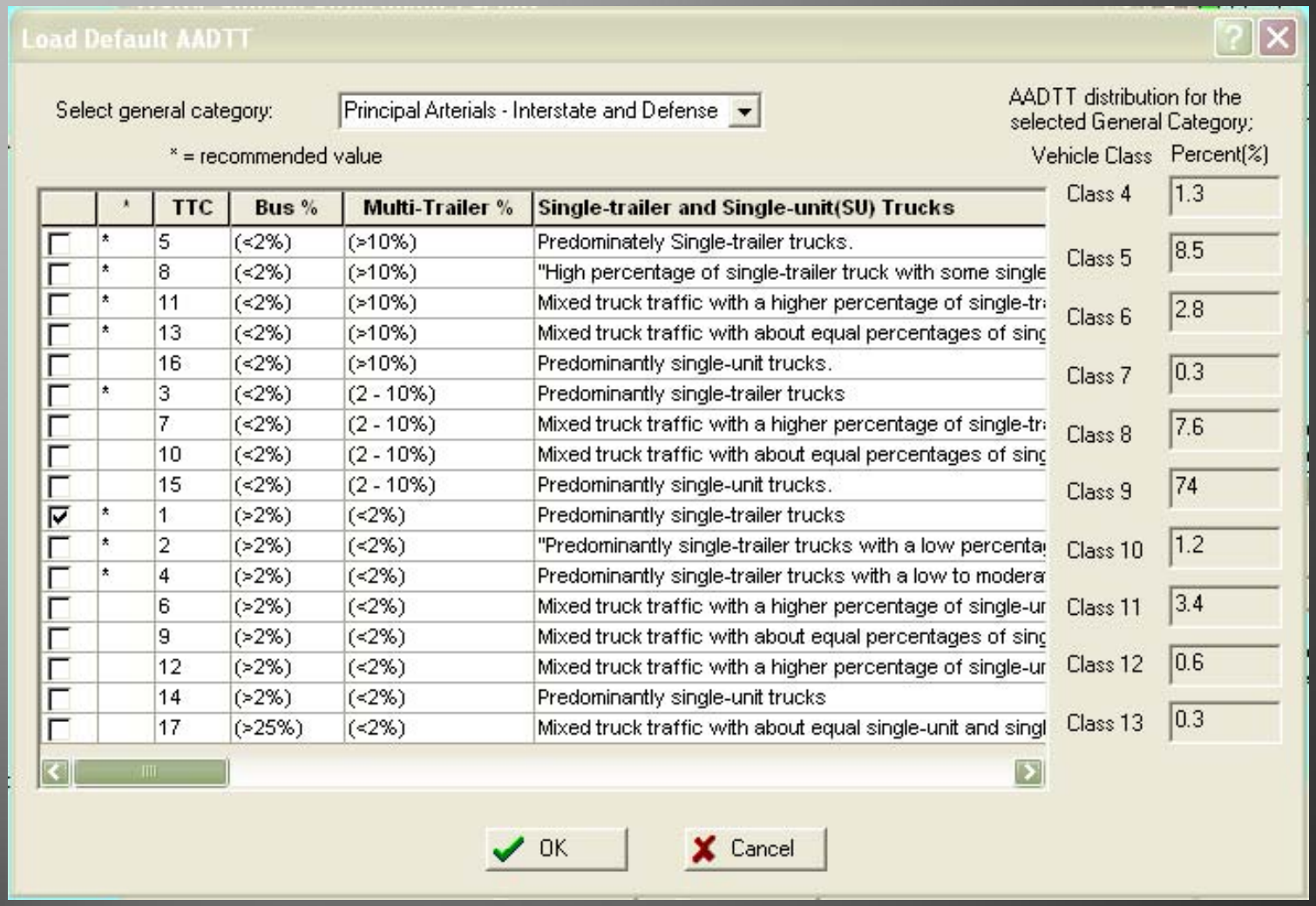
Traffic Volume Adjustment Factors – **Vehicle Class Distribution**



- Traffic forecasters pull information out of TRADAS and combine into our 5 classes.
- Several TTC groups are recommended for WisDOT's use.

Mourning Dove – state symbol of peace

TTC (Truck Traffic Classification) Groups



	*	TTC	Bus %	Multi-Trailer %	Single-trailer and Single-unit(SU) Trucks
☐	*	5	(<2%)	(>10%)	Predominately Single-trailer trucks.
☐	*	8	(<2%)	(>10%)	"High percentage of single-trailer truck with some single
☐	*	11	(<2%)	(>10%)	Mixed truck traffic with a higher percentage of single-tr
☐	*	13	(<2%)	(>10%)	Mixed truck traffic with about equal percentages of sing
☐		16	(<2%)	(>10%)	Predominantly single-unit trucks.
☐	*	3	(<2%)	(2 - 10%)	Predominantly single-trailer trucks
☐		7	(<2%)	(2 - 10%)	Mixed truck traffic with a higher percentage of single-tr
☐		10	(<2%)	(2 - 10%)	Mixed truck traffic with about equal percentages of sing
☐		15	(<2%)	(2 - 10%)	Predominantly single-unit trucks.
☑	*	1	(>2%)	(<2%)	Predominantly single-trailer trucks
☐	*	2	(>2%)	(<2%)	"Predominantly single-trailer trucks with a low percenta
☐	*	4	(>2%)	(<2%)	Predominantly single-trailer trucks with a low to modera
☐		6	(>2%)	(<2%)	Mixed truck traffic with a higher percentage of single-ur
☐		9	(>2%)	(<2%)	Mixed truck traffic with about equal percentages of sing
☐		12	(>2%)	(<2%)	Mixed truck traffic with a higher percentage of single-ur
☐		14	(>2%)	(<2%)	Predominantly single-unit trucks
☐		17	(>25%)	(<2%)	Mixed truck traffic with about equal single-unit and singl

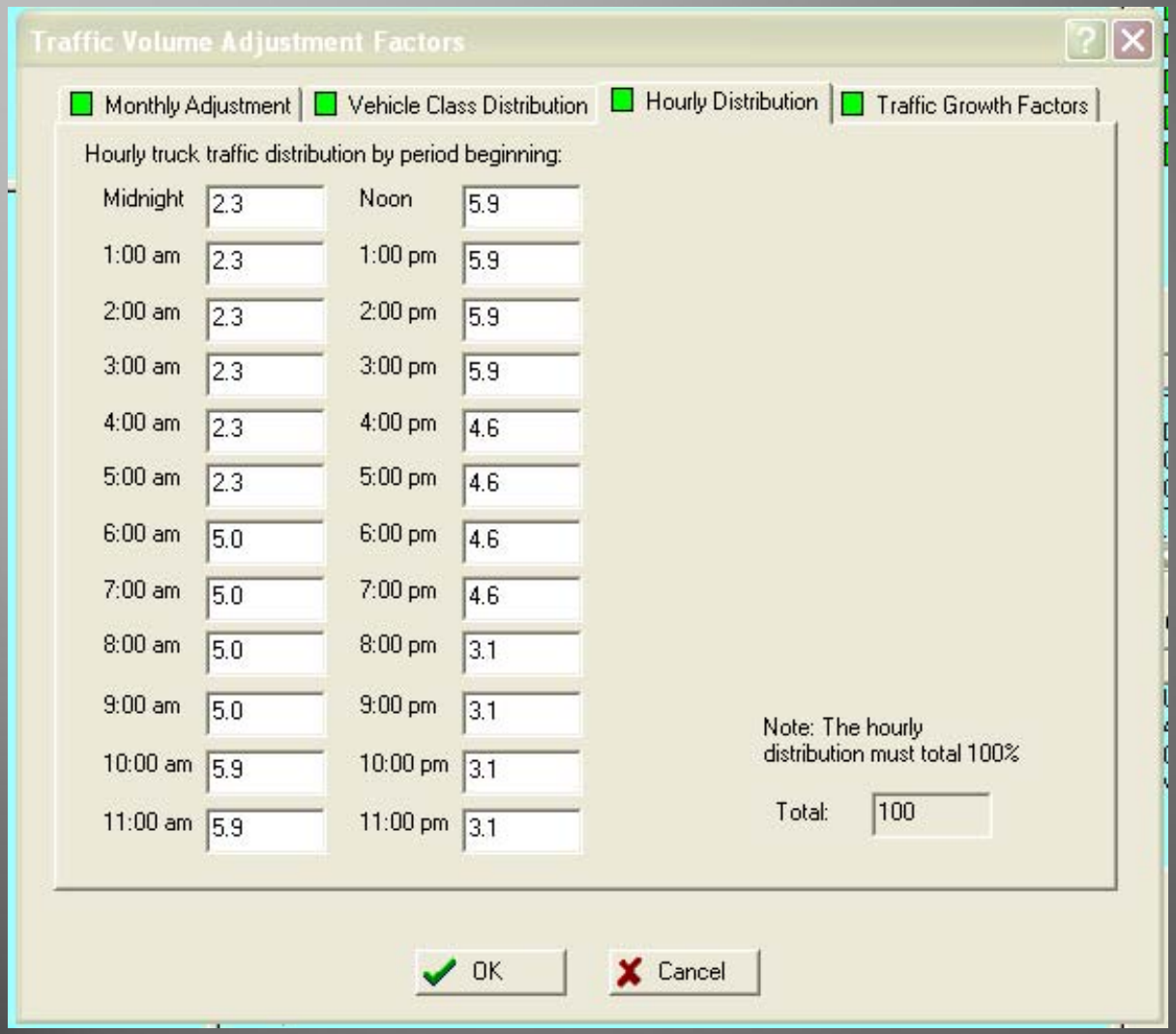
Phase I suggested "The vehicle class distributions at any given LTPP site…could be reasonably matched with…TTC groups 2, 4, 9 or 12."

Phase I Recommendations

Highway Functional Class	Matched TTC Group	Number of Sites	Recommended TTC Group*
Rural Minor Arterial (RMA)	9	1	9, 12
	12	1	
Rural Principal Arterial-Interstate (RPA-I)	2	4	2, 4
	4	3	
Rural Principal Arterial – State Route (RPA-SR)	9	1	9, 12
	12	1	
Rural Principal Arterial – US (RPA-US)	2	3	2, 4
	4	6	
	9	1	
	12	1	
UPA (Urban Principal Arterial)	2	1	2, 4*
	4	1	

* The recommendation was based on a very limited number of LTPP sites. Further verification is needed.

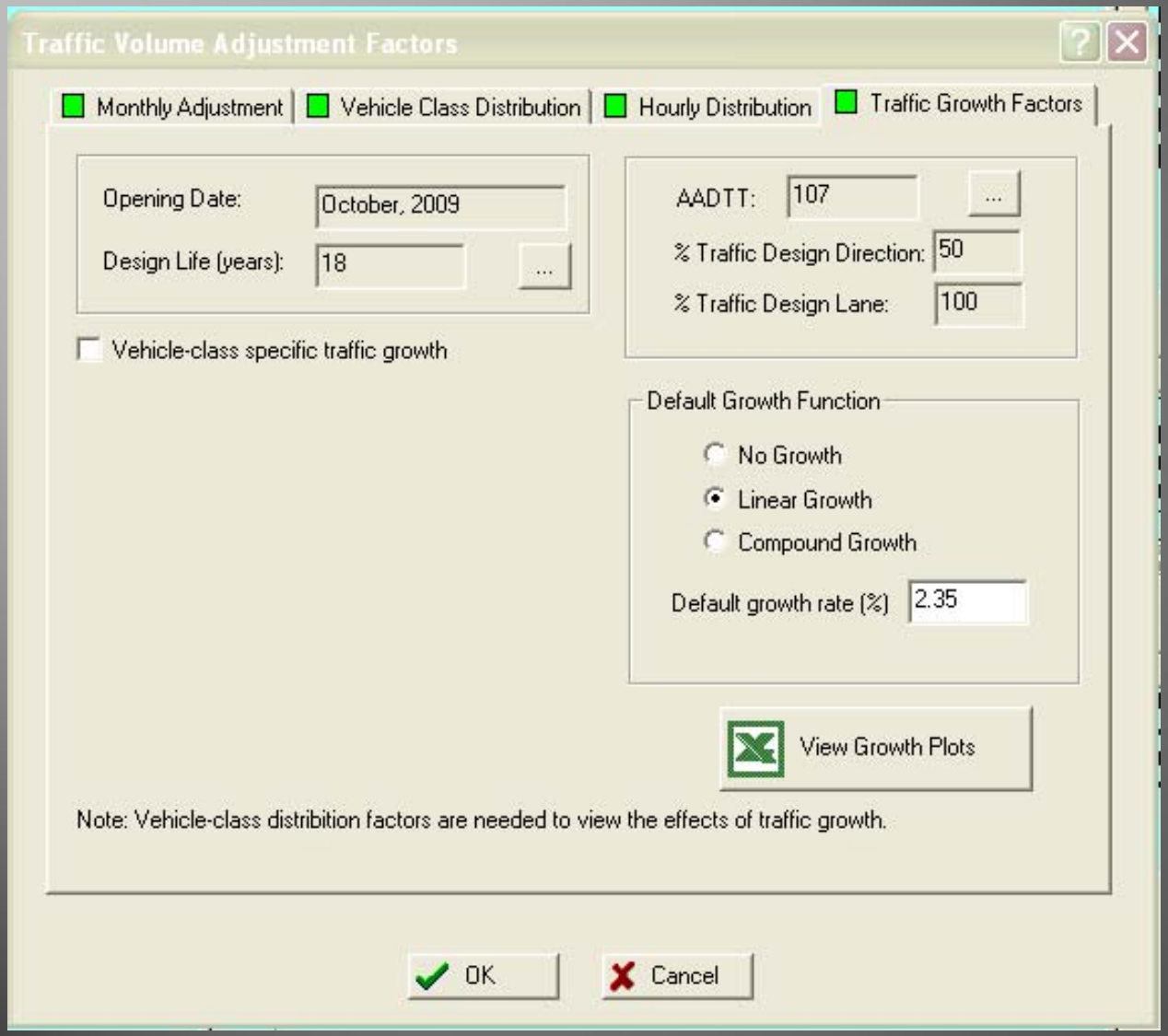
Traffic Volume Adjustment Factors – **Hourly Distribution**



- At this time we do not have any sites that collect this or a report that presents this information. Could glean with some effort.
- Phase I recommends using defaults.

American Water Spaniel – state dog

Traffic Volume Adjustment Factors – Traffic Growth Factors



- Traffic growth function information comes from our traffic forecasters.

White-tailed deer – state wildlife animal

Axle Load Distribution Factors

State animal

Badger – state animal

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

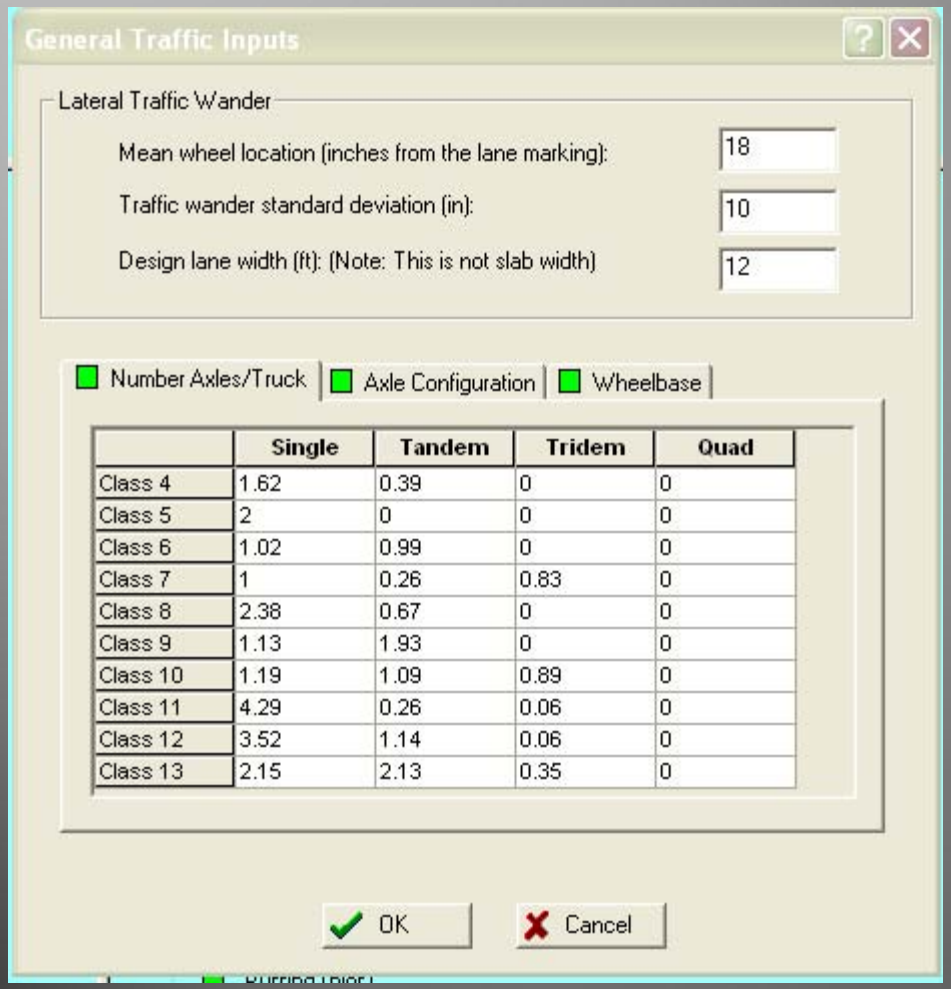
	Season	Veh. Class	Total	3000	4000	5000	6000	700
	February	4	100.00	1.8	0.96	2.91	3.99	6.8
	February	5	100.00	10.03	13.21	16.41	10.61	9.24
	February	6	100.00	2.47	1.78	3.45	3.95	6.7
	February	7	100.00	2.14	0.55	2.42	2.7	3.21
	February	8	100.00	11.65	5.36	7.83	6.99	7.99
	February	9	100.00	1.74	1.37	2.84	3.53	4.93
	February	10	100.00	3.64	1.24	2.36	3.38	5.18
	February	11	100.00	3.55	2.91	5.19	5.27	6.33
	February	12	100.00	6.68	2.29	4.88	5.87	5.98
	February	13	100.00	8.88	2.67	3.81	5.23	6.04

OK

Cancel

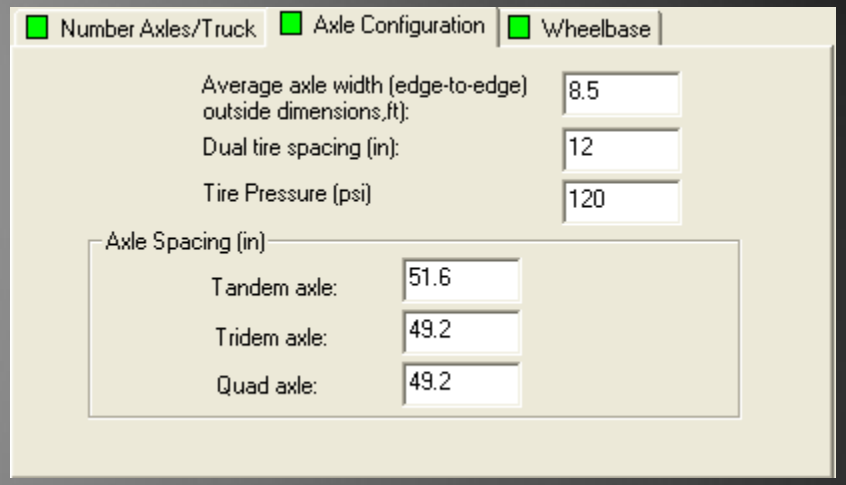
- Currently don't have a method to generate this information.
- Phase I - use default distributions for most design situations. Specific information should be gathered for critical pavements.

General Traffic Inputs

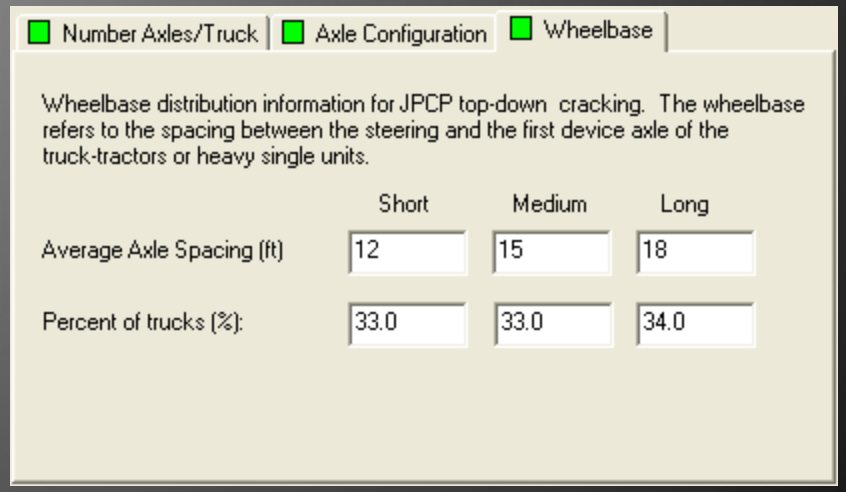


	Single	Tandem	Tridem	Quad
Class 4	1.62	0.39	0	0
Class 5	2	0	0	0
Class 6	1.02	0.99	0	0
Class 7	1	0.26	0.83	0
Class 8	2.38	0.67	0	0
Class 9	1.13	1.93	0	0
Class 10	1.19	1.09	0.89	0
Class 11	4.29	0.26	0.06	0
Class 12	3.52	1.14	0.06	0
Class 13	2.15	2.13	0.35	0

Number of Axles per Truck



Axle Configuration



Wheelbase

- Defaults currently recommended

Status of Implementation in Wisconsin

We plan to implement soon after DARWin M-E becomes available

Have good materials and climate data

Have not thoroughly investigated our traffic data
- Can we use defaults?
- Can we use existing TTCs?
- Which traffic inputs are most sensitive?

Is a more thorough study needed?

How will we analyze our data and get it into the MEPDG?
- Atlas?
- Trafload?
- PrepME?

American Robin – state bird

Muskellunge – state fish

How will we instruct our pavement designers to use traffic data?
- Will we define which TTCs are appropriate for what roadways?
- Will we sometimes use WIM data?

We will hold off implementation if we feel we're not ready

Thank you

Laura L Fenley, PE
Pavement Engineer
Wisconsin DOT
3502 Kinsman Blvd
Madison WI 53704
608 246-5455
laura.fenley@dot.wi.gov