

Managing Traffic Data for Pavement Design

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Bruce Tanquist, P.E.

Mn/DOT

bruce.tanquist@dot.state.mn.us

Acknowledgments

Curt Dahlin

**Mn/DOT Office of Transportation Data and
Analysis (retired)**


Maggi Chalkline


**Mn/DOT Office of Transportation Data and
Analysis**

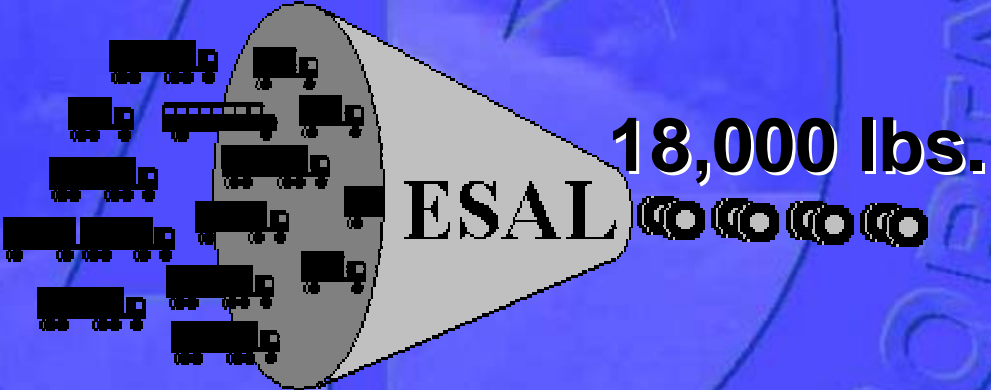
Rolf Benson

Mn/DOT Office of Materials

Traffic Data

- **AADT** 

- **HCAADT** 

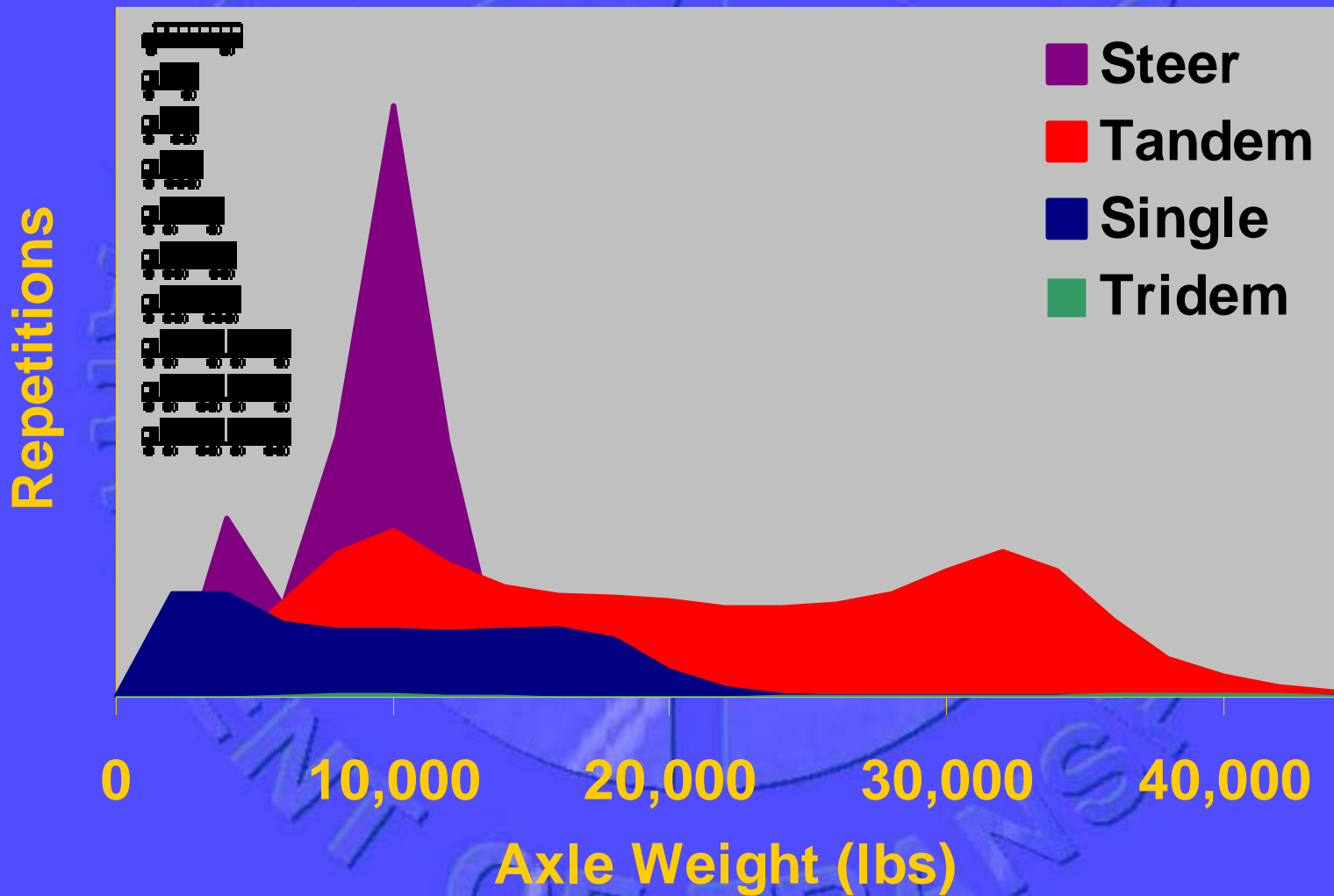
- **ESALS** 

- **Load Spectrum** 

Simplified Load Spectrum Input

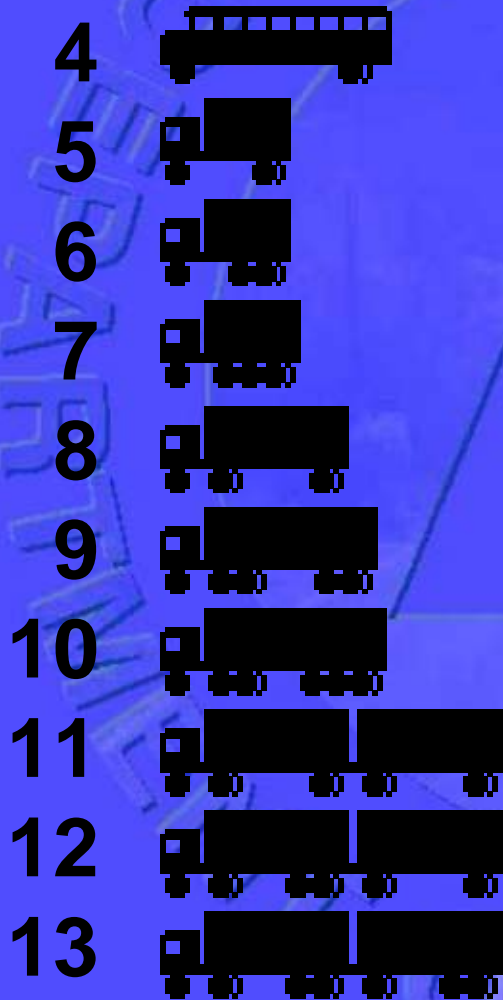
- **Analysis of WIM data**
- **Mn/DOT and FHWA vehicle types**
- **Axle distributions by truck type**
- **Assumptions about truck distributions**
- **Route types**

MnROAD 2001 WIM Data

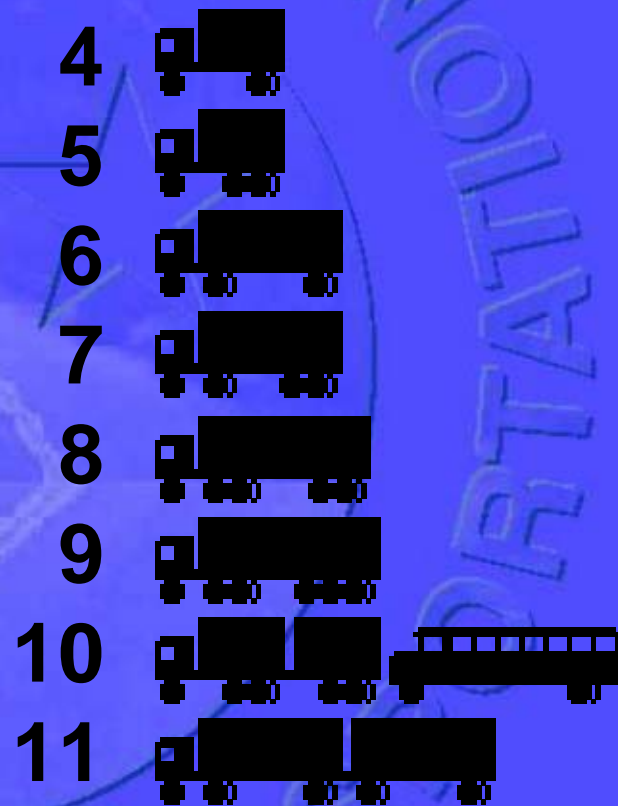


Vehicle Types

FHWA

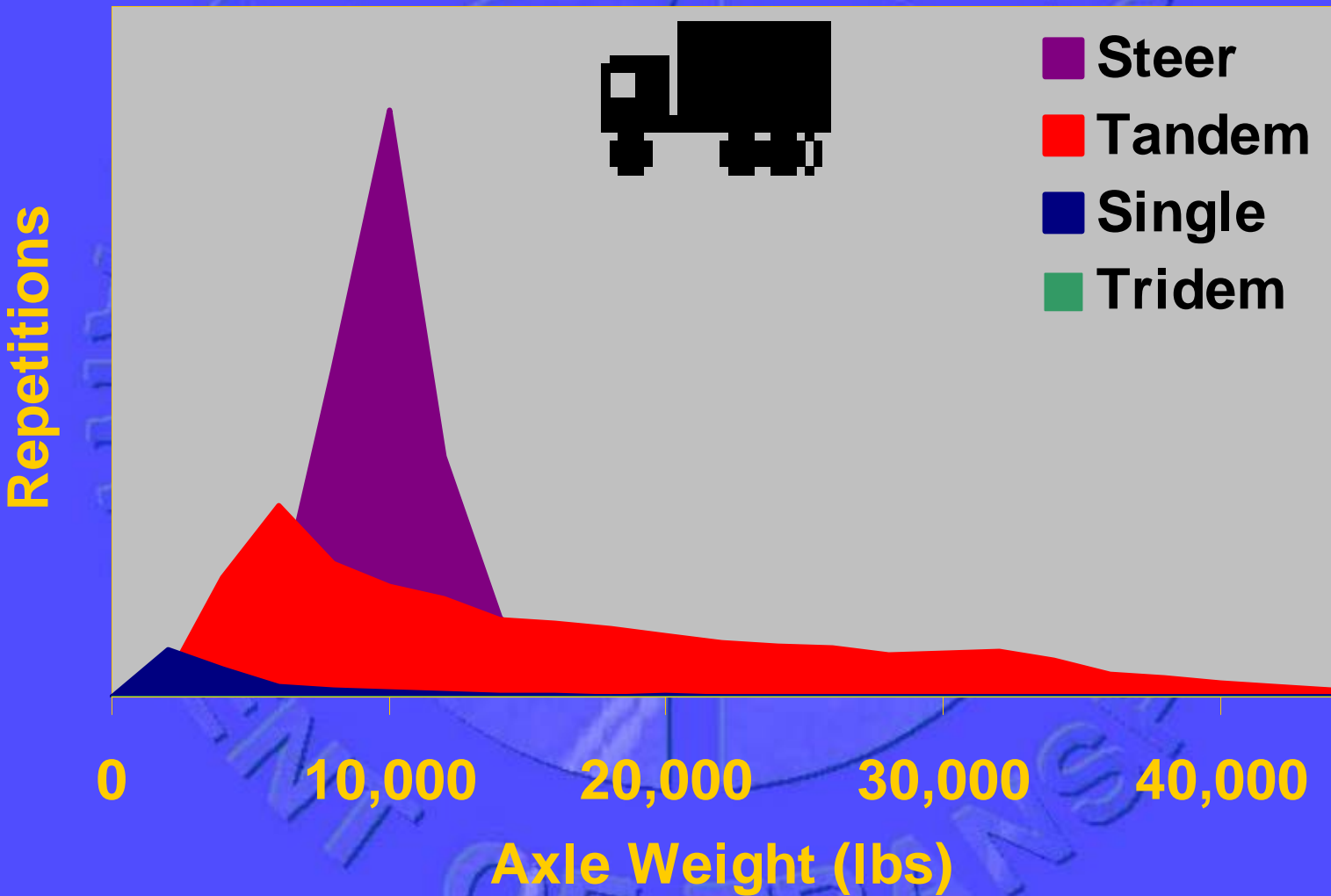


Mn/DOT

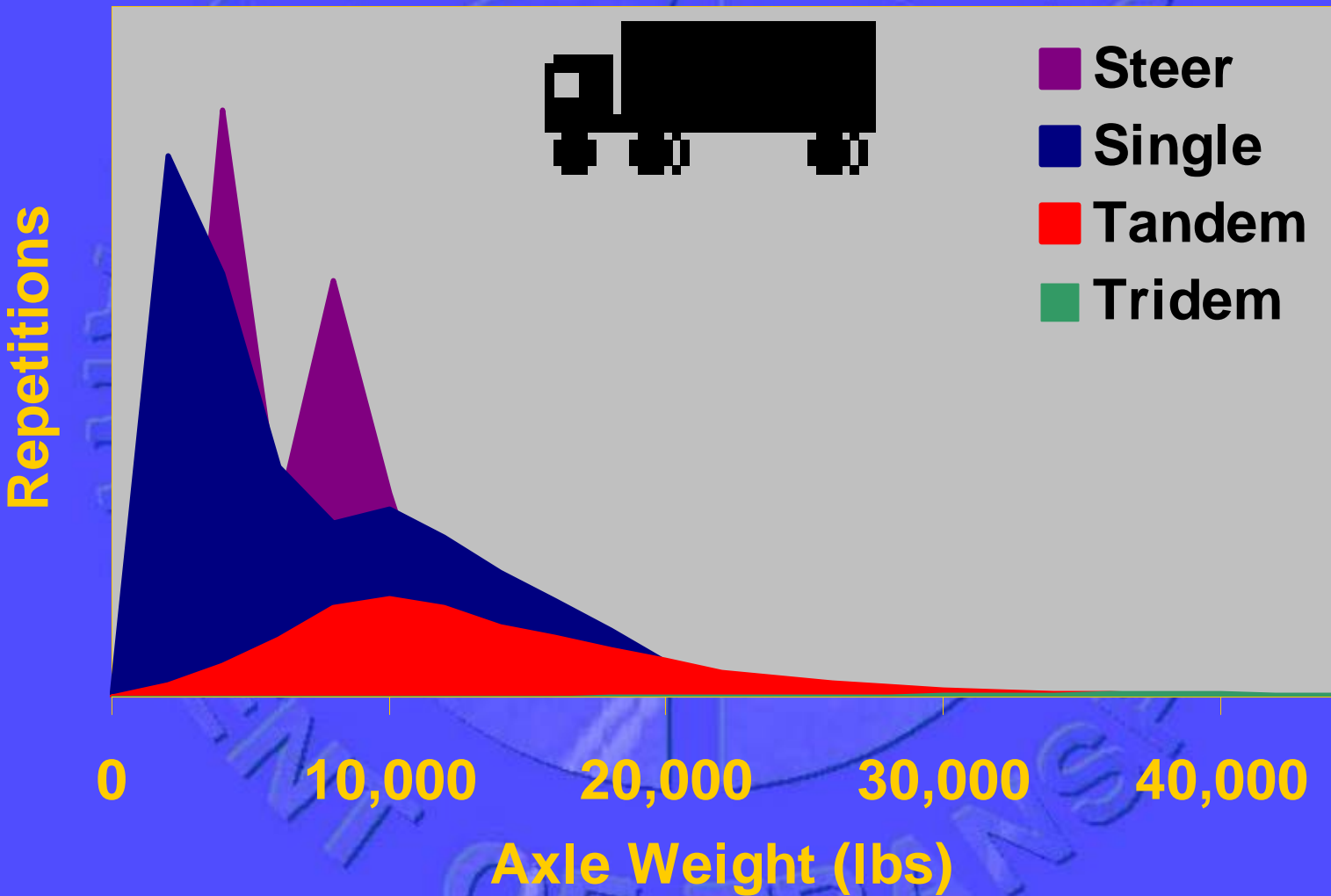


(1 – 3 are cars and light trucks)

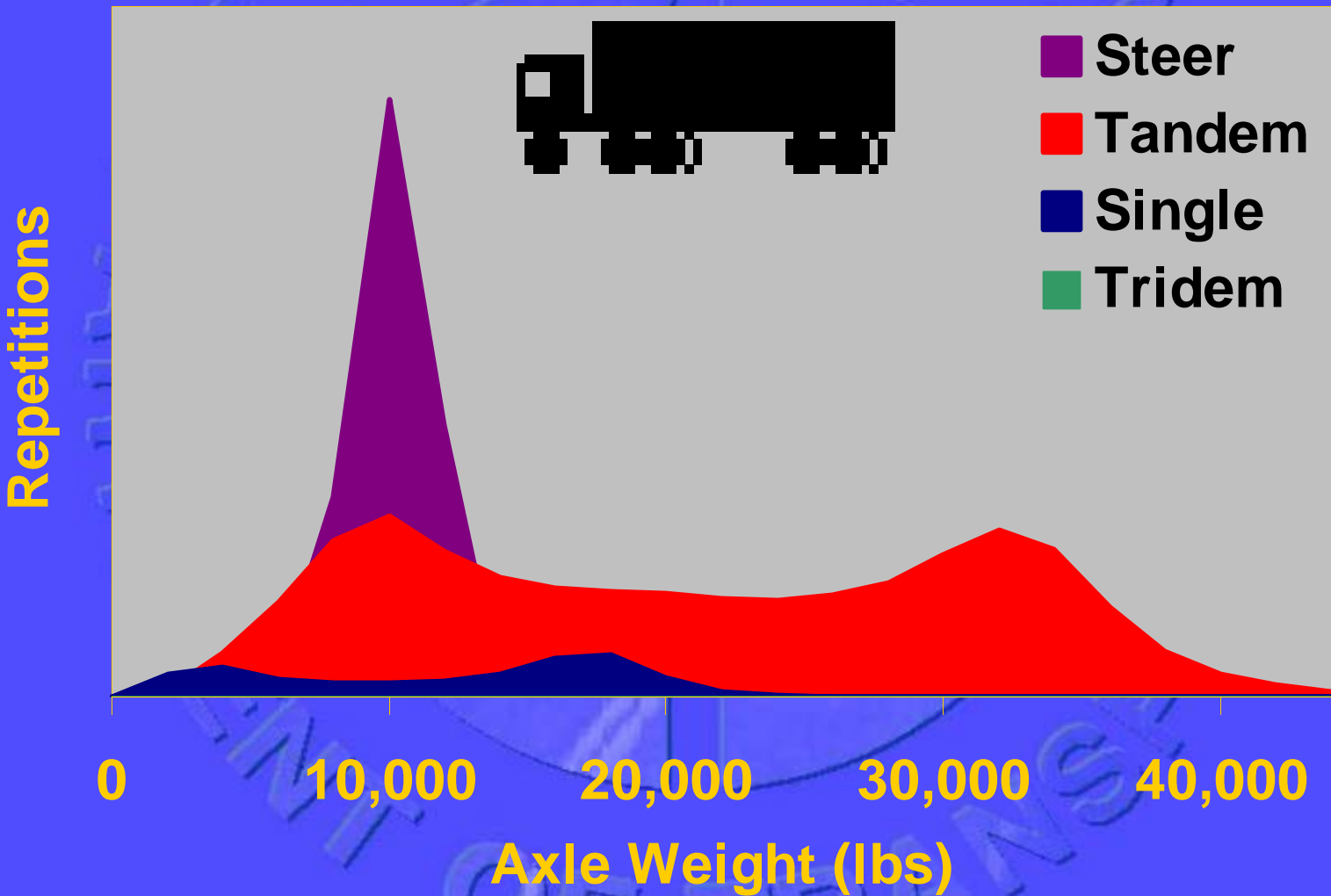
Vehicle Type 6



Vehicle Type 8



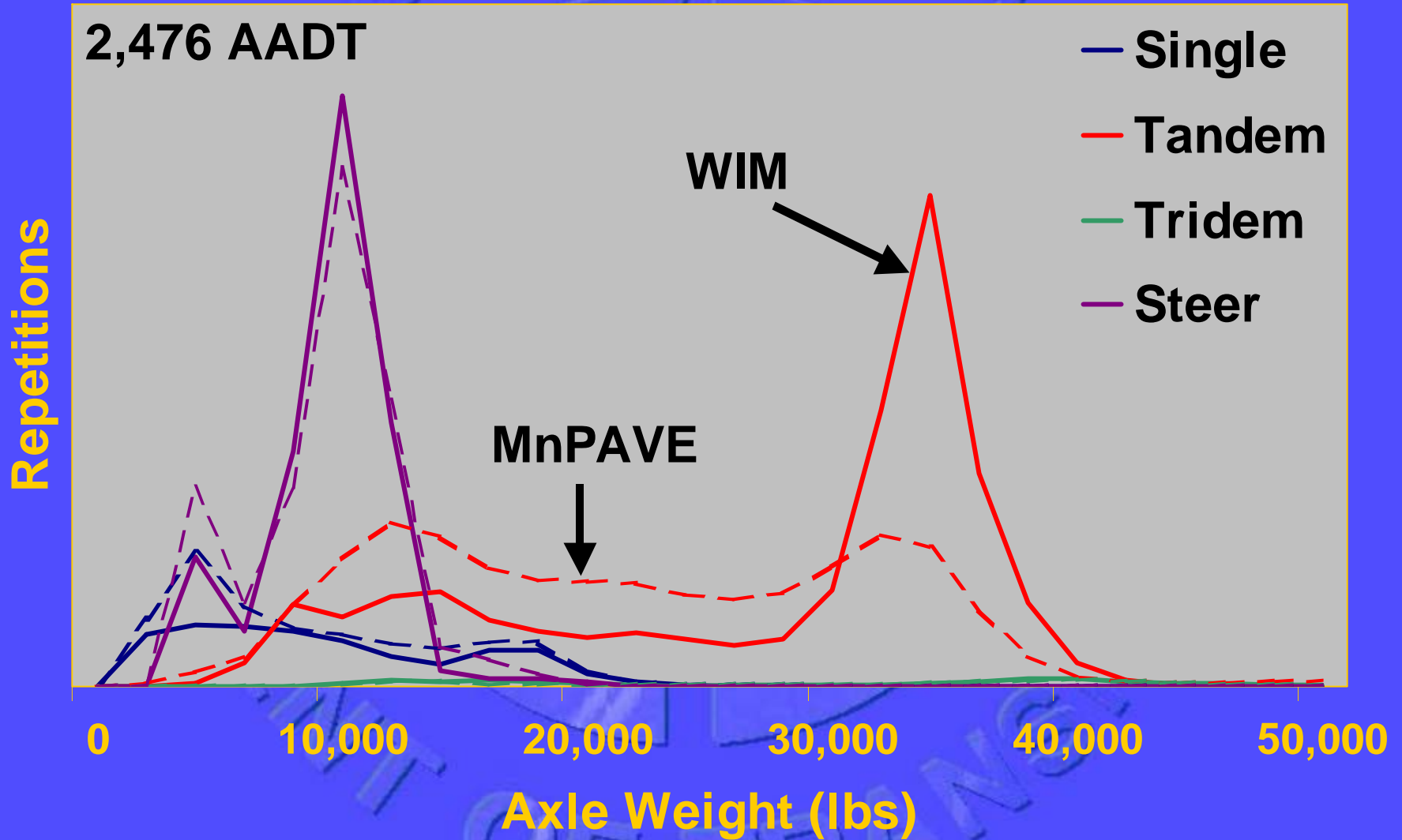
Vehicle Type 9



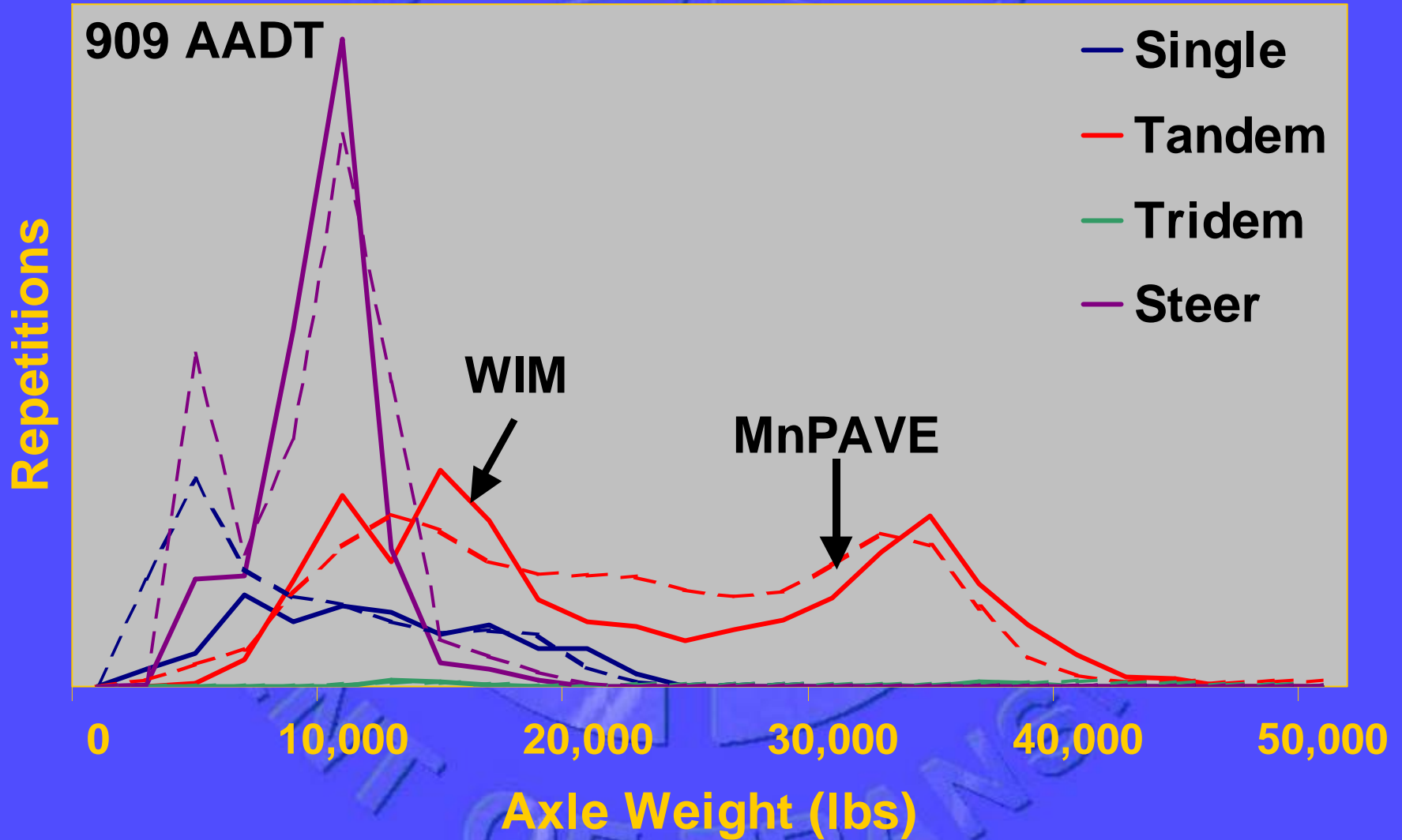
Assumptions

- Trucks of the same type have the same axle load distribution statewide.
- Vehicle type percentages can be predicted by route type.

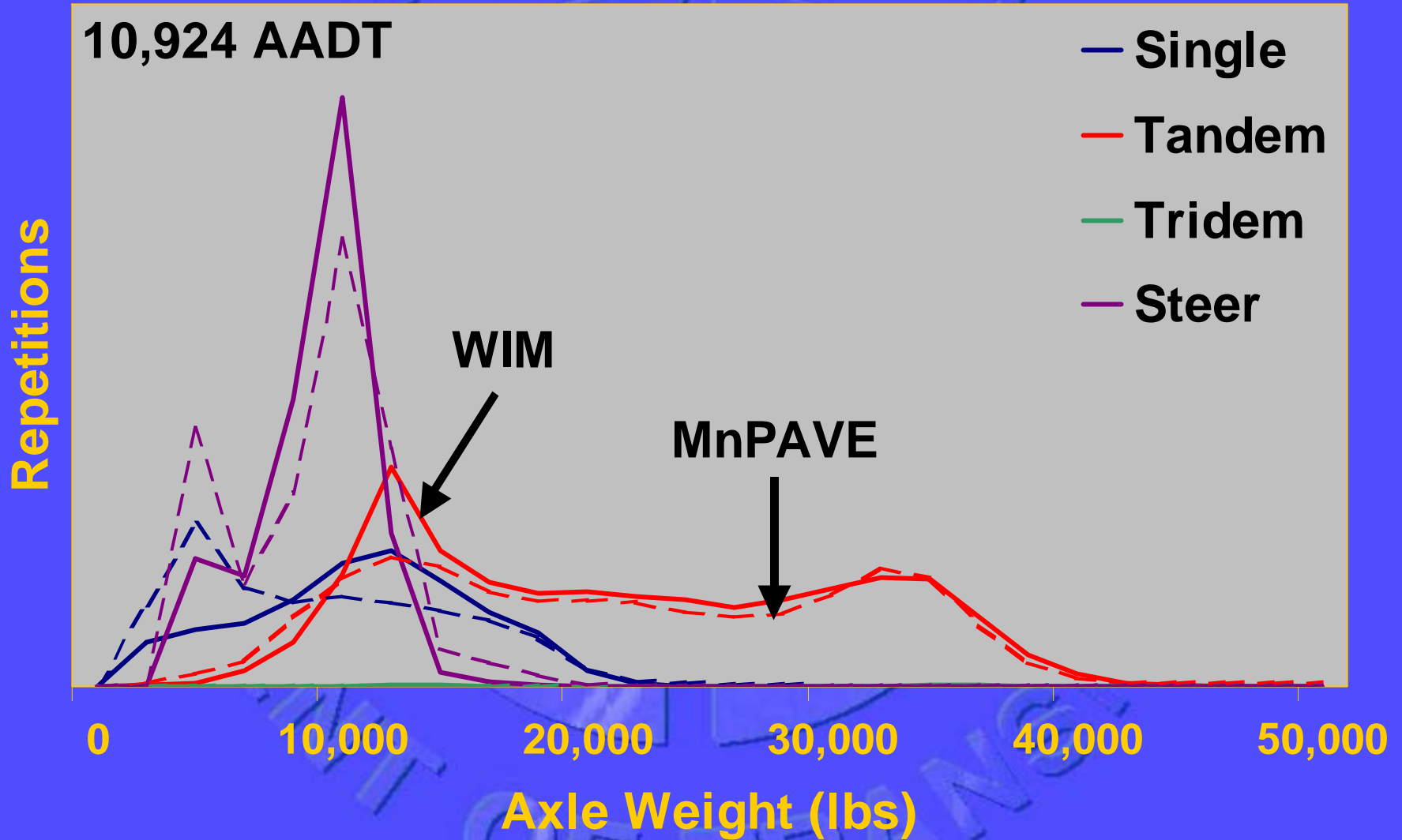
Bemidji TH2 (June 1 - July 1 1992)



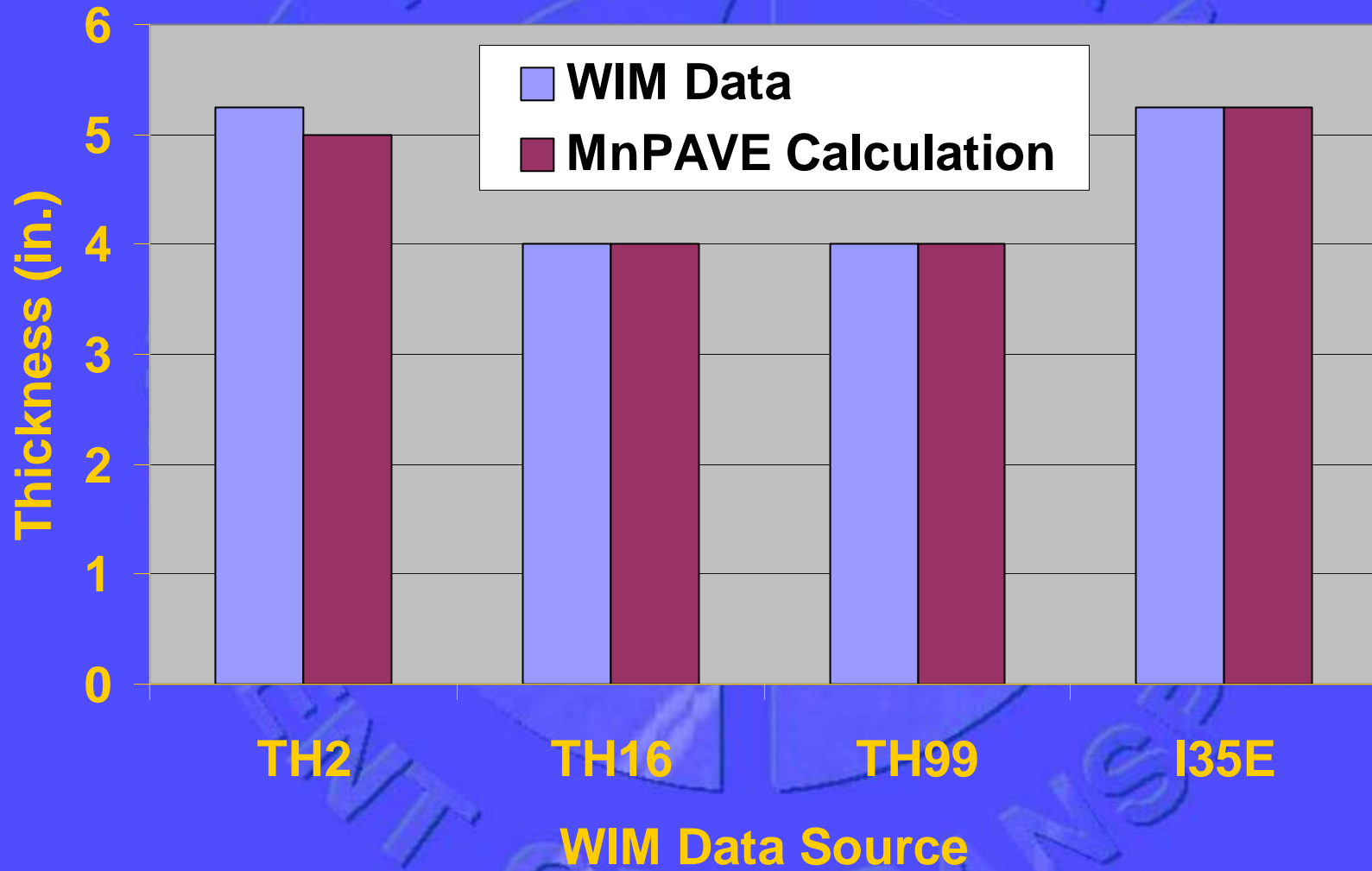
St. Peter TH99 (Oct. 1 - Nov. 1 1992)



Burnsville I-35E (Feb. 1 - Mar. 1 1992)



MnPAVE HMA Design Thickness



Route Types

City	Highway	Route Type
Bloomington	I-494	Urban Interstate
Clearwater	I-94	Rural Interstate
Luverne	I-90	Rural Interstate
Dexter	TH 16	Urban Highway
Cambridge	TH 65	Urban Highway
Eagan	TH 13	Urban Highway
New Ulm	TH 15	Rural Highway
Bemidji	US 2	Rural Highway

Spectrum

Basic | Intermediate | Advanced

Traffic Input

First Year Design Lane AADT

Design Life (years)

Annual Growth Rate (%)

 Simple
 Compound

Traffic Mode: ▼

Units
 English
 SI

Finished Traffic
 Go to
 Control Panel

Traffic Types

- Urban Interstate
- Rural Interstate
- Urban Highway
- Rural Highway
- Low Volume
- Custom

Note: Basic calculations provide a rough estimate of the load spectrum for a given route and are not intended for design use.



Spectrum

Basic | Intermediate | Advanced

Standard Vehicle Types Custom Traffic

- Mn/DOT
- FHWA

Traffic Input

First Year
Design Lane
AADT

909

Design Life (years)

20

Annual Growth Rate (%)












3

- Simple
- Compound

Traffic Mode: Intermediate

- Units
- English
 - SI

Finished Traffic
Go to
Control Panel

Type No.		Percent	
1 - 3.	Autos, Light Trucks	91.4	 (Calculated)
4.	Buses	0.5	
5.	2 Axle 6 Tire	1.4	
6.	3 Axle Single	0.7	
7.	4+ Axle Single	0.2	
8.	3 & 4 Axle Semi	0.7	
9.	5 Axle Semi	4.9	
10.	6+ Axle Semi	0.2	
11.	5 Axle Multi-Trailer	0	
12.	6 Axle Multi-Trailer	0	
13.	7+ Axle Multi-Trailer	0	



Note: Load Spectrum calculations are based on vehicle and axle data recorded by the Weigh-In-Motion device at Mn/ROAD.

Spectrum

Basic | Intermediate | Advanced

Tire Pressure...	100	100	100	100	
Tire Spacing ...	13.50	13.50	13.50		
Axle Spacing...		54.00	54.00		

Traffic Input

First Year
Design Lane
AADT

909

Design Life (years)

20

Annual Growth Rate (%)

3

- Simple
- Compound

Traffic Mode:

Basic

Units

- English
- SI

Finished Traffic
Go to
Control Panel

Lifetime Axle Repetitions Seasonal Traffic Use WIM Data

Axle Weight (kips)	<input checked="" type="checkbox"/> Dual	<input checked="" type="checkbox"/> Tandem	<input checked="" type="checkbox"/> Tridem	<input checked="" type="checkbox"/> Steer	<input type="checkbox"/> Single	<input type="checkbox"/> Tandem	<input type="checkbox"/> Tridem
1 - 3	40,430	2,421	0	0			
3 - 5	79,763	8,625	4	122,367			
5 - 7	48,062	16,578	41	51,031			
7 - 9	36,565	42,828	192	108,596			
9 - 11	35,072	66,912	624	267,916			
11 - 13	29,507	83,935	1,441	148,020			
13 - 15	25,607	76,288	1,235	21,342			
15 - 17	26,826	60,660	594	13,925			
17 - 19	24,917	54,674	291	6,953			
19 - 21	9,110	54,103	276	1,144			
21 - 23	2,335	53,071	349	314			
23 - 25	1,093	47,092	356	108			
25 - 27	909	44,366	442	65			

Clear All

Rural Highway

Calculated ESALs = 546,367

Show LEF

What's Next

- **More WIM data**
- **More vehicle class counts**
- **Seasonal traffic data**

<http://mnroad.dot.state.mn.us>

Questions?

