

Managing Traffic Data for Pavement Design

Fifteenth Annual Transportation Research Conference

May 4-5, 2004

Saint Paul, MN

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Acknowledgments

Curt Dahlin

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


Maggi Chalkline


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

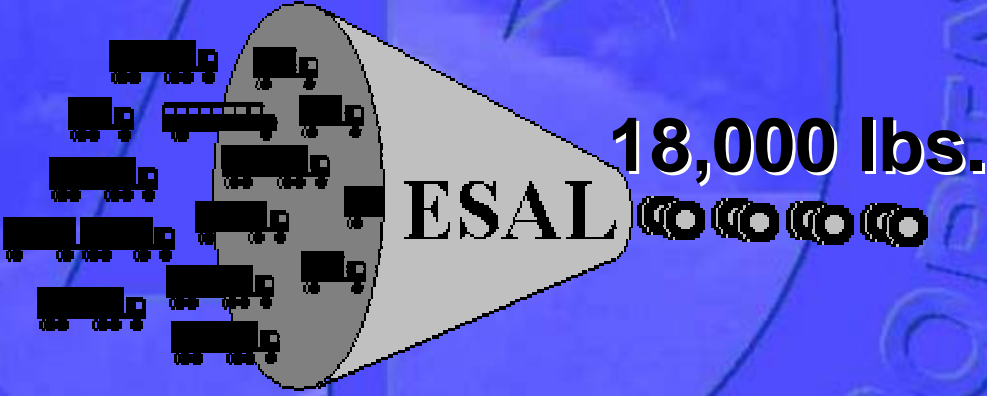
Rolf Benson

Mn/DOT Office of Materials

Traffic Data

- **AADT** 

- **HCAADT** 

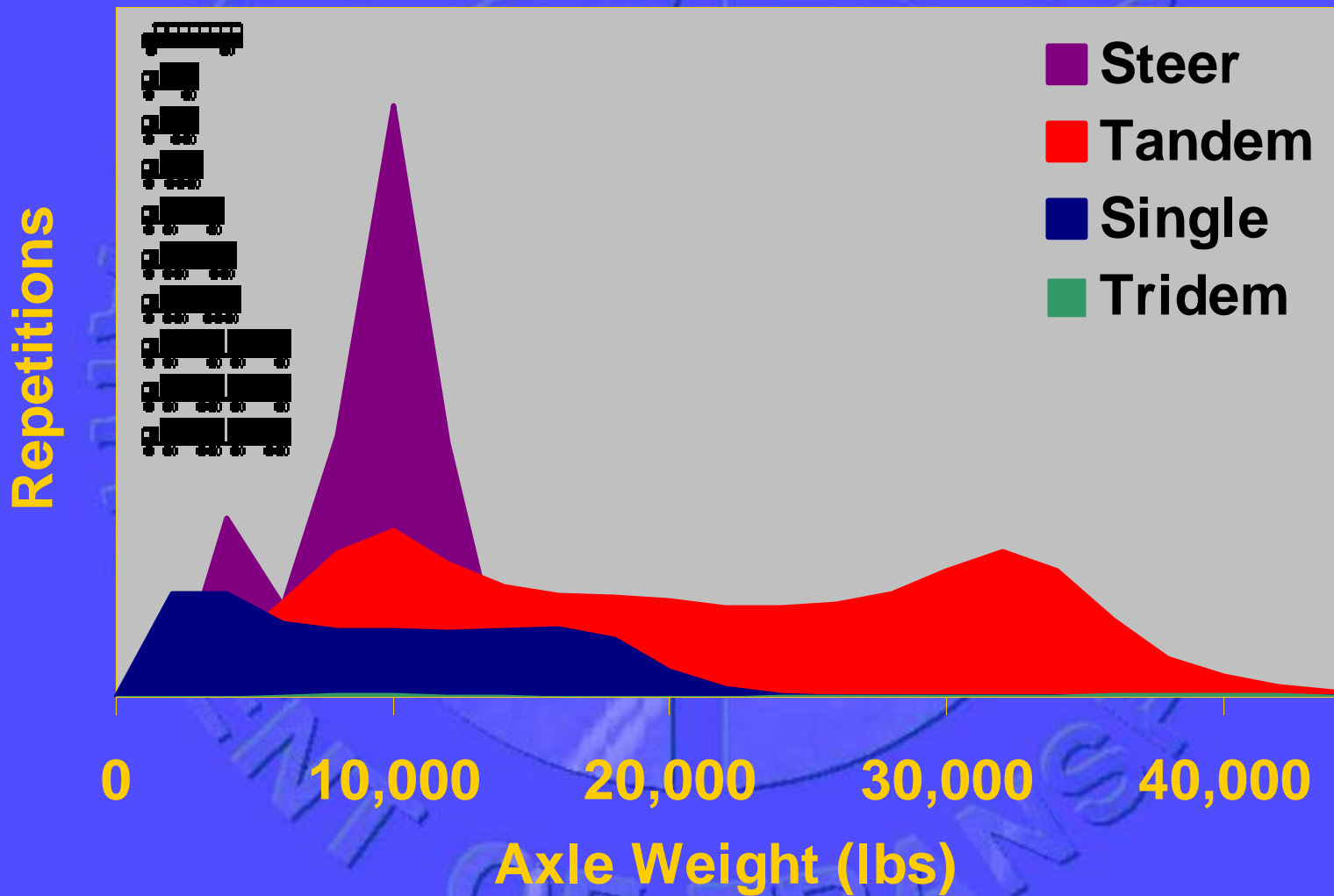
- **ESALS** 

- **Load Spectrum** 

Simplified Load Spectrum Input

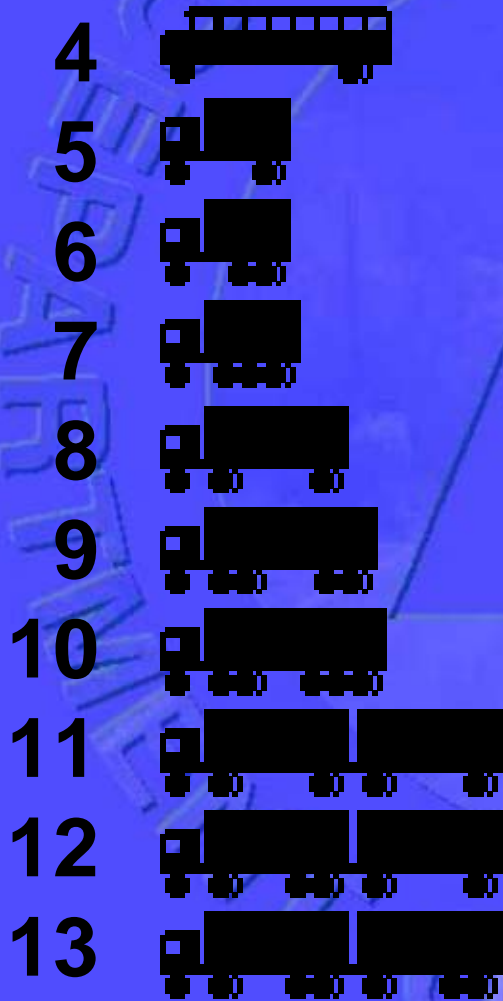
- **Analysis of WIM data**
- **Mn/DOT and FHWA vehicle types**
- **Axle distributions by truck type**
- **Assumptions about truck distributions**
- **Route types**

MnROAD 2001 WIM Data

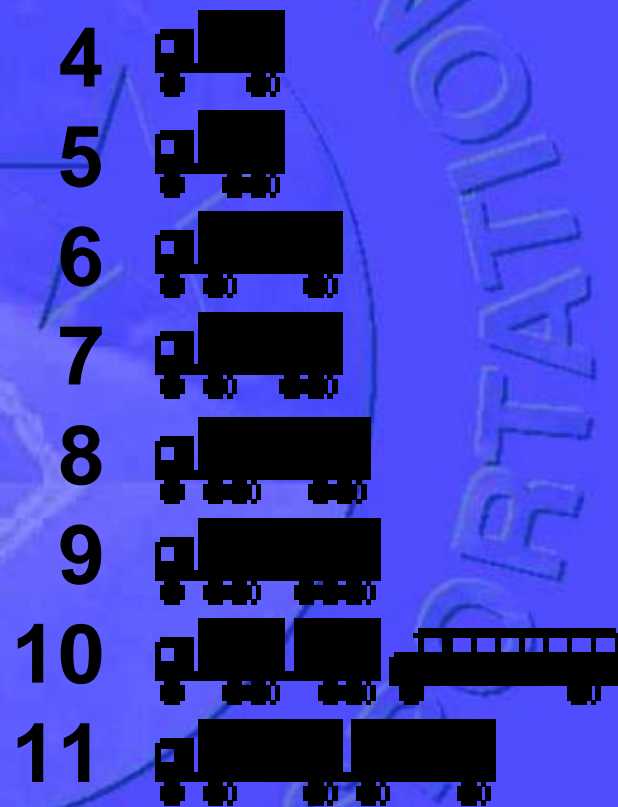


Vehicle Types

FHWA

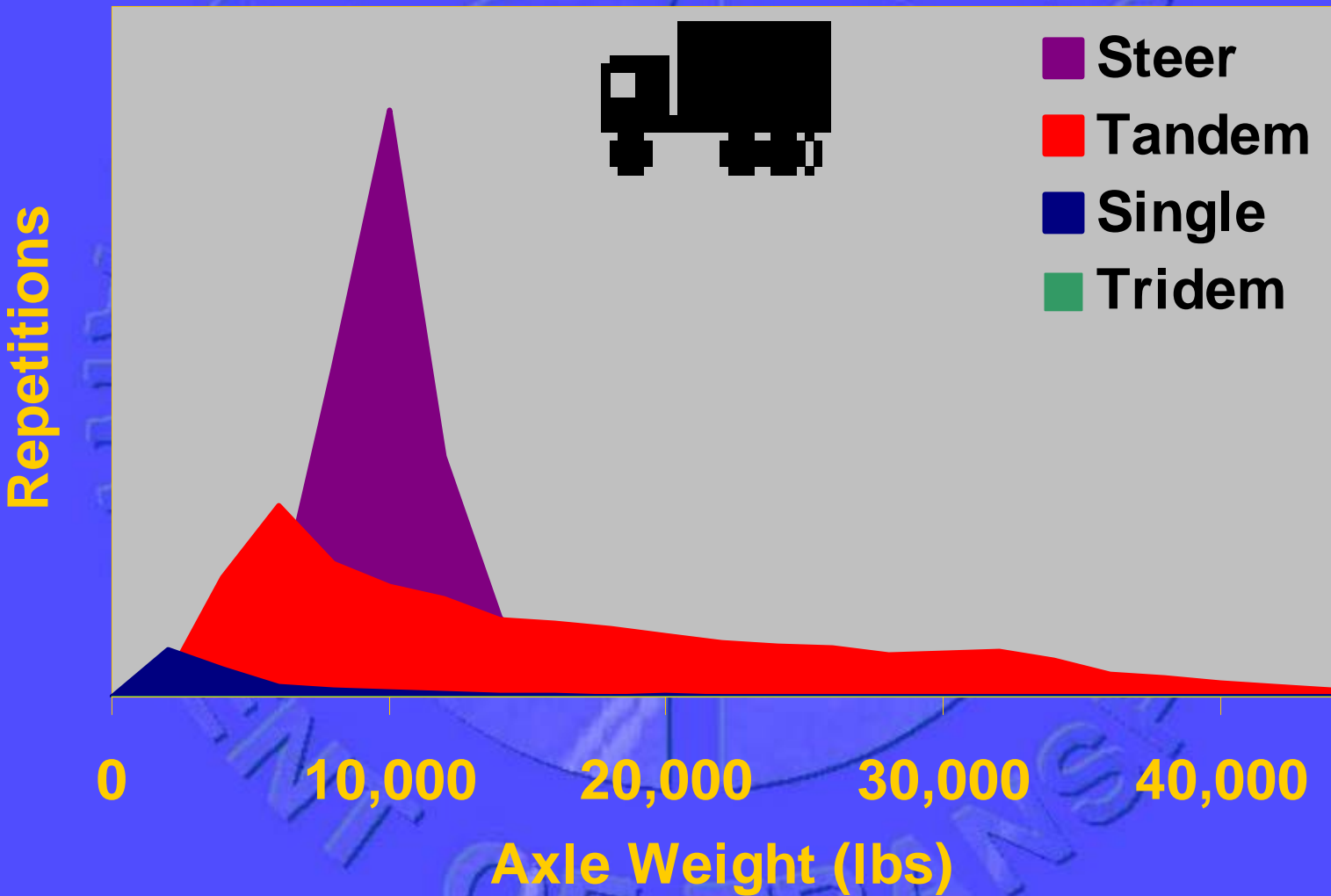


Mn/DOT



(1 – 3 are cars and light trucks)

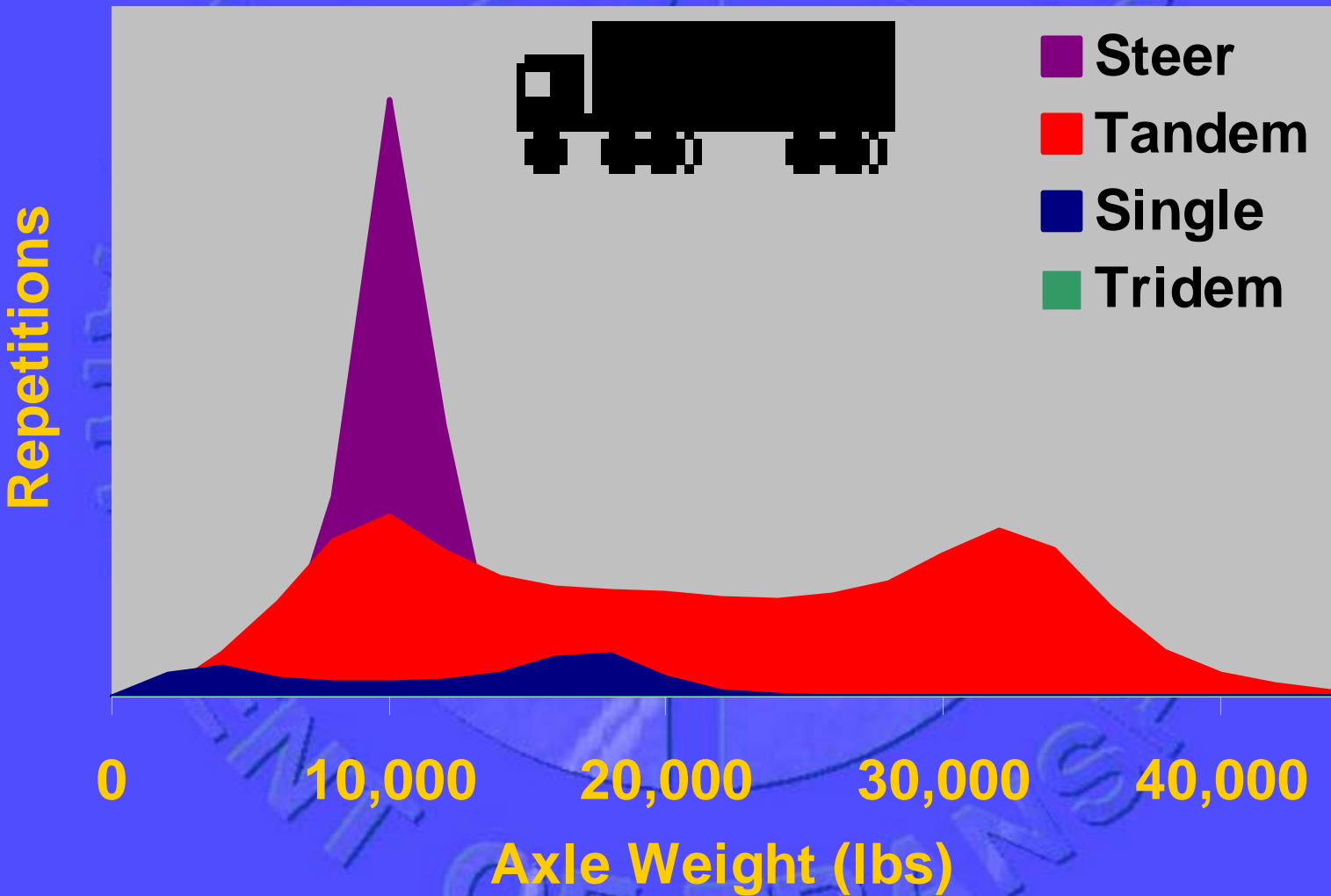
Vehicle Type 6



Vehicle Type 8



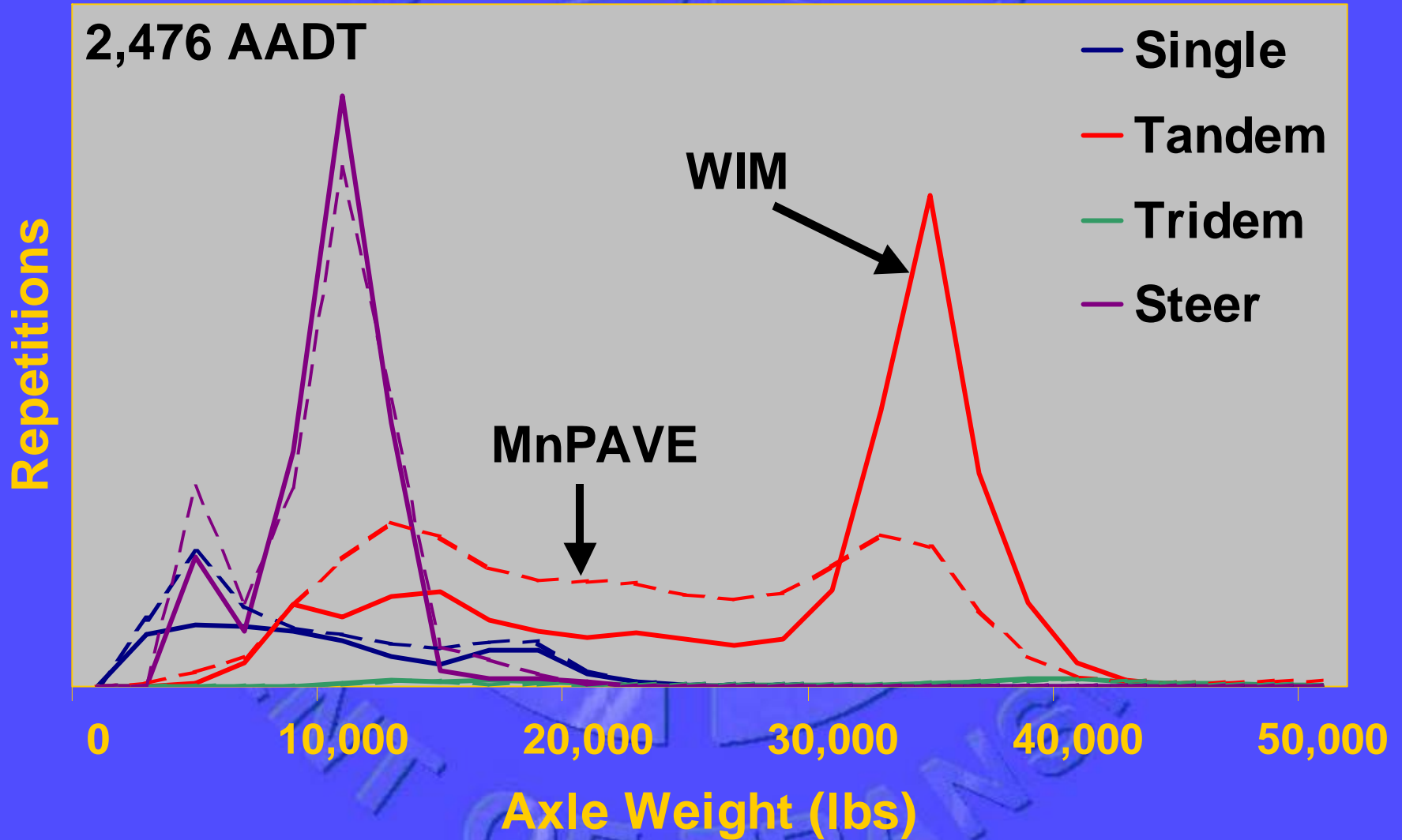
Vehicle Type 9



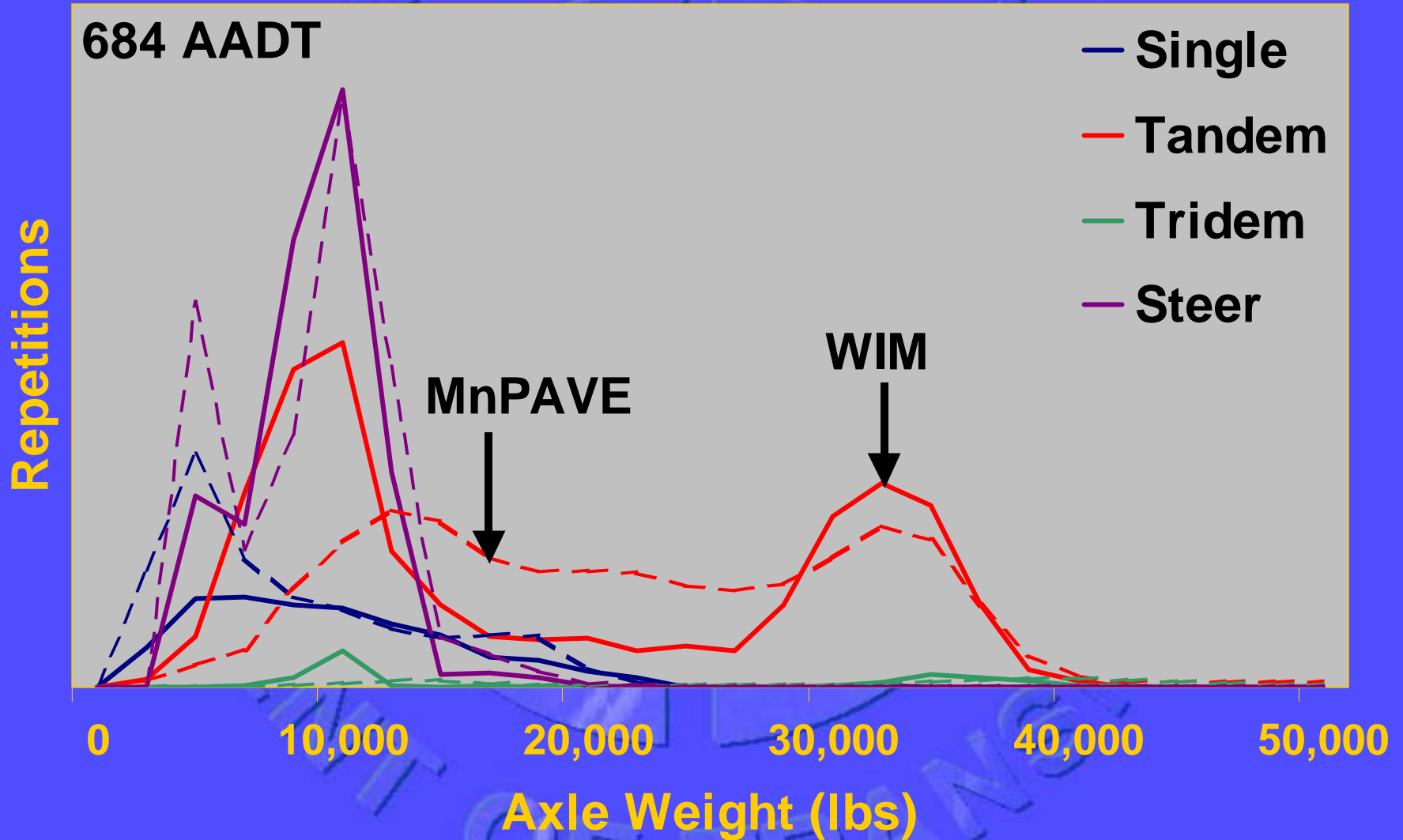
Assumptions

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

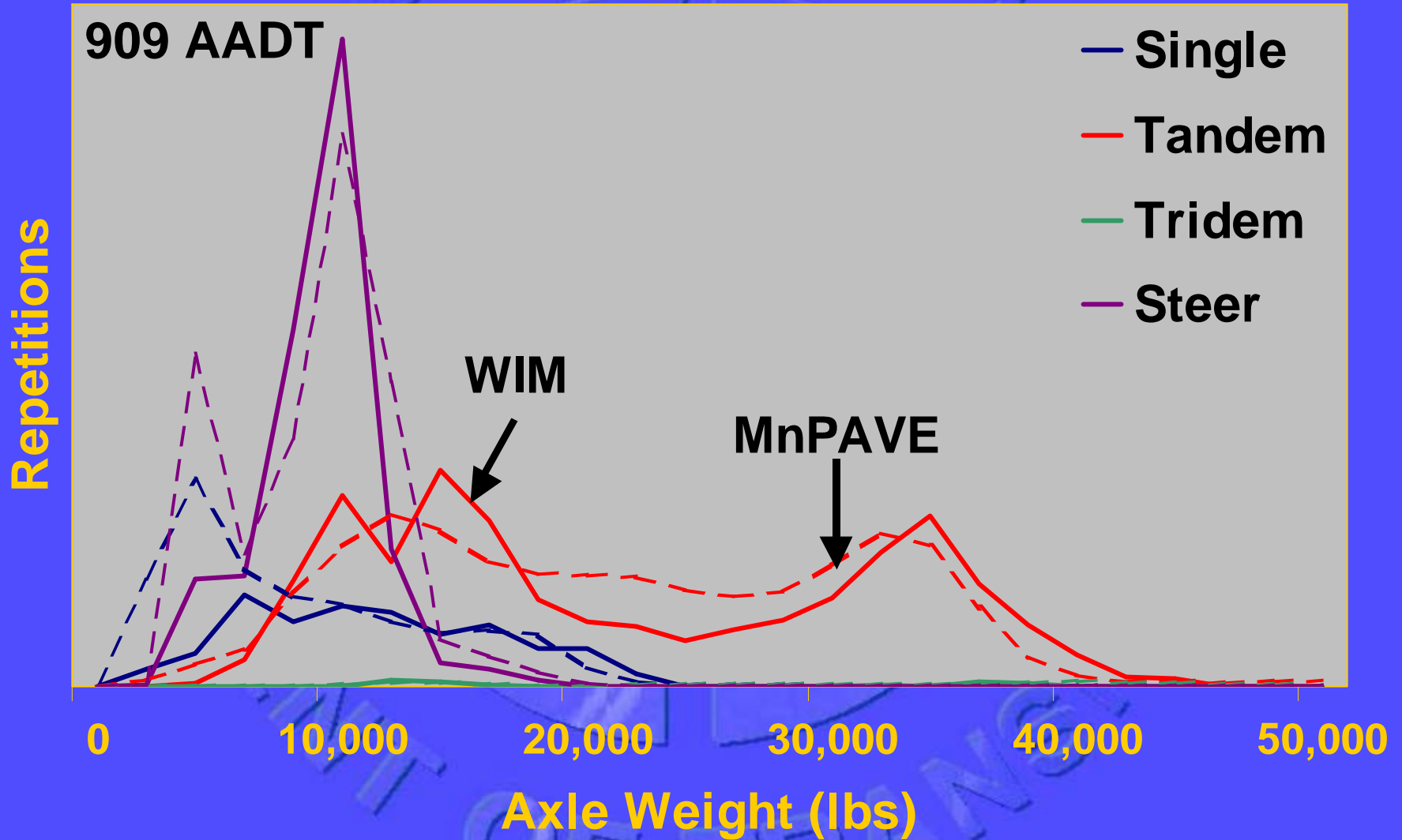
Bemidji TH2 (June 1 - July 1 1992)



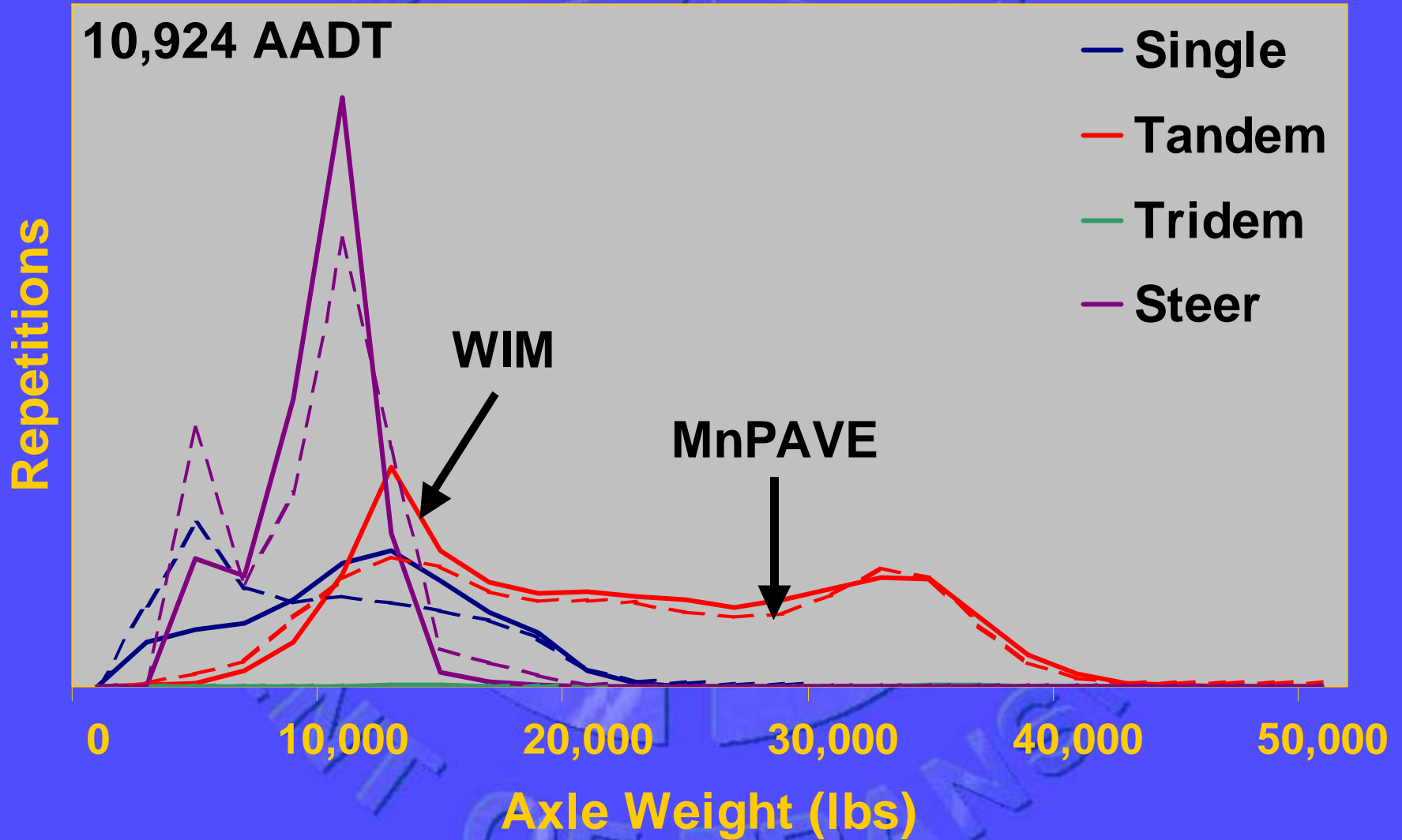
Dexter TH16 (April 1 - May 1 1992)



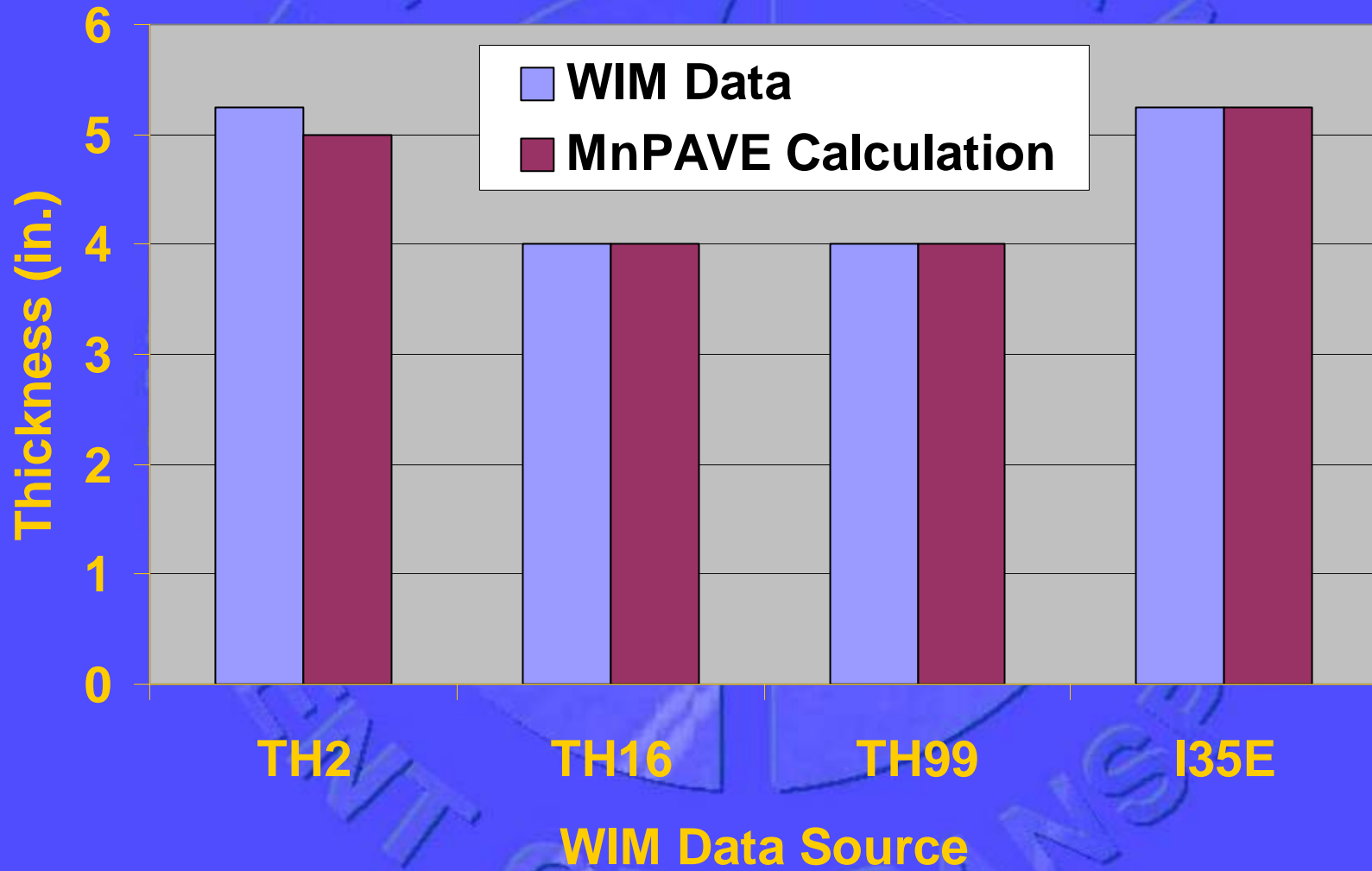
St. Peter TH99 (Oct. 1 - Nov. 1 1992)



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

Design Life (years)

Annual Growth Rate (%)

Simple Compound

Traffic Mode:

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			

Units

English SI

Finished Traffic
Go to Control Panel

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?

