

2003 AAR CAR REPAIR BILLING WHEEL REMOVAL ANALYSIS

**Richard Sullivan, John Oliver
Cameron Lonsdale, Jean Iorio**

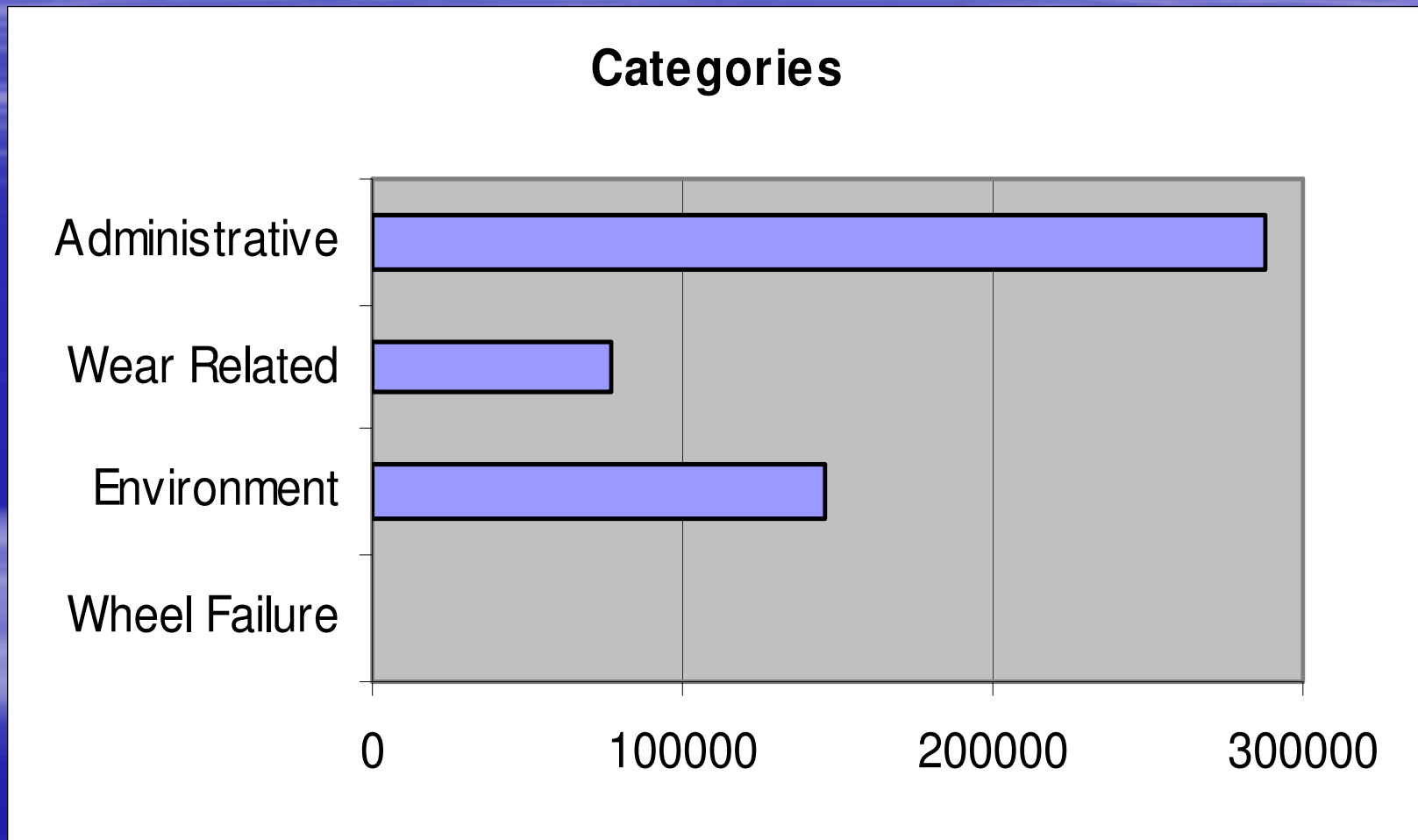
RWMEC

Who we are

Approved AAR Wheel Manufacturers

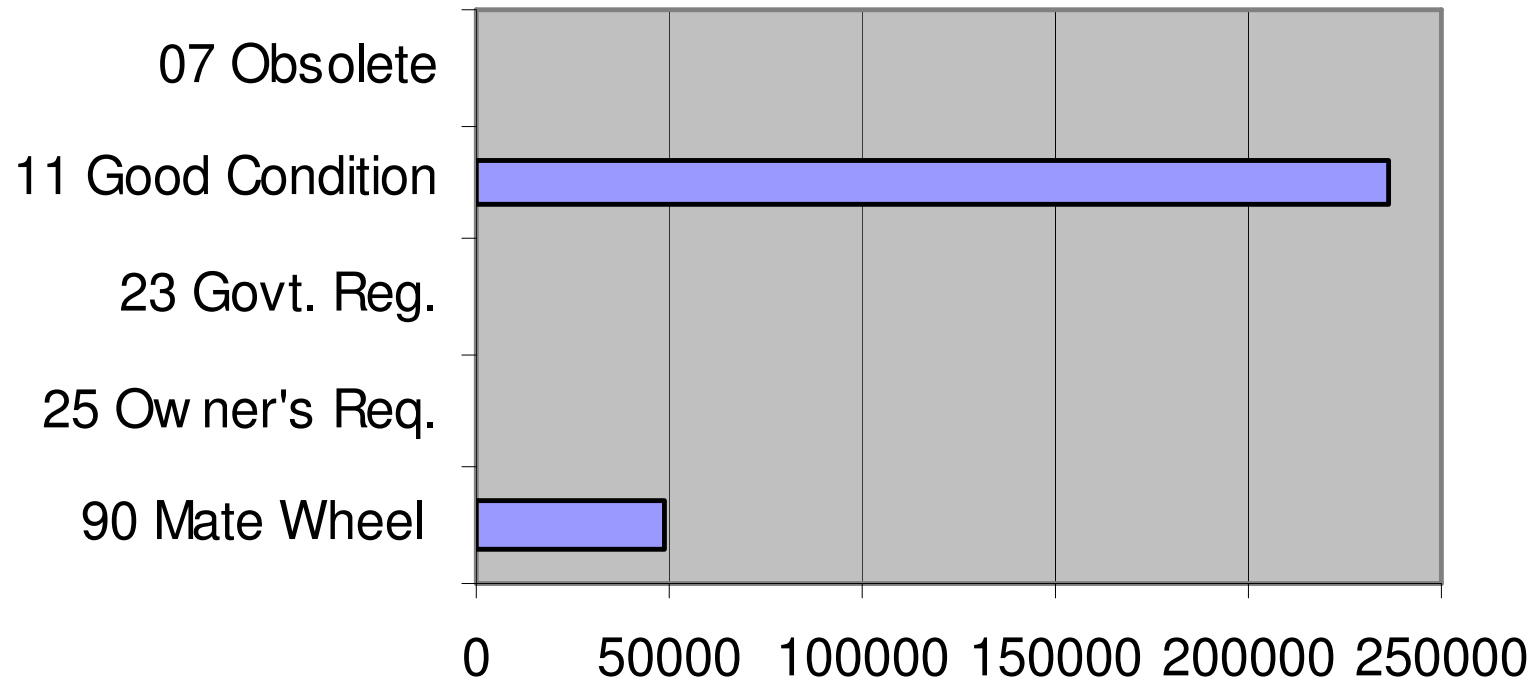
Mission - Support the WABL Committee
and the Railroad Industry

WHEEL REMOVAL CATEGORIES

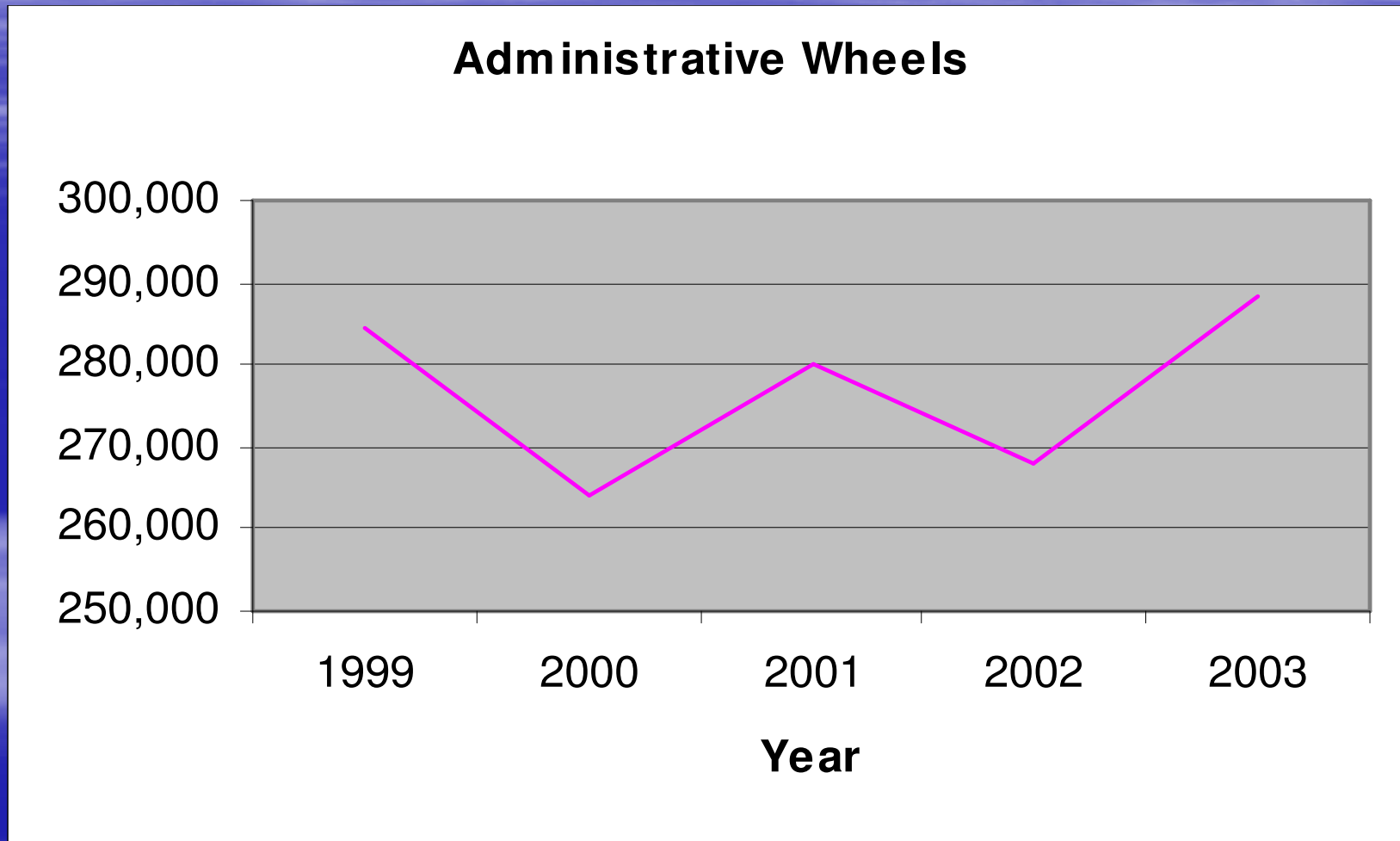


Administrative

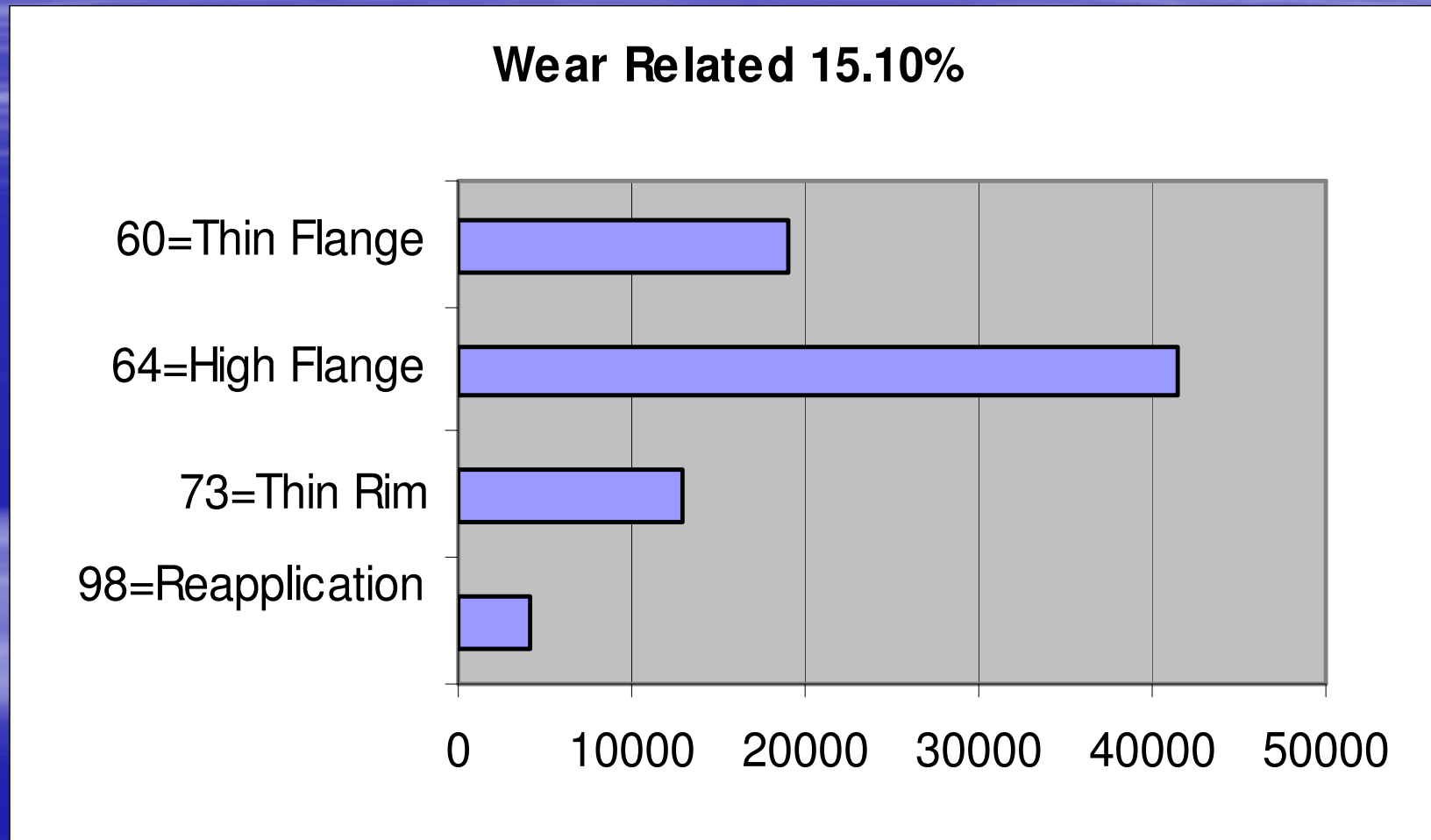
Administrative 56.21%



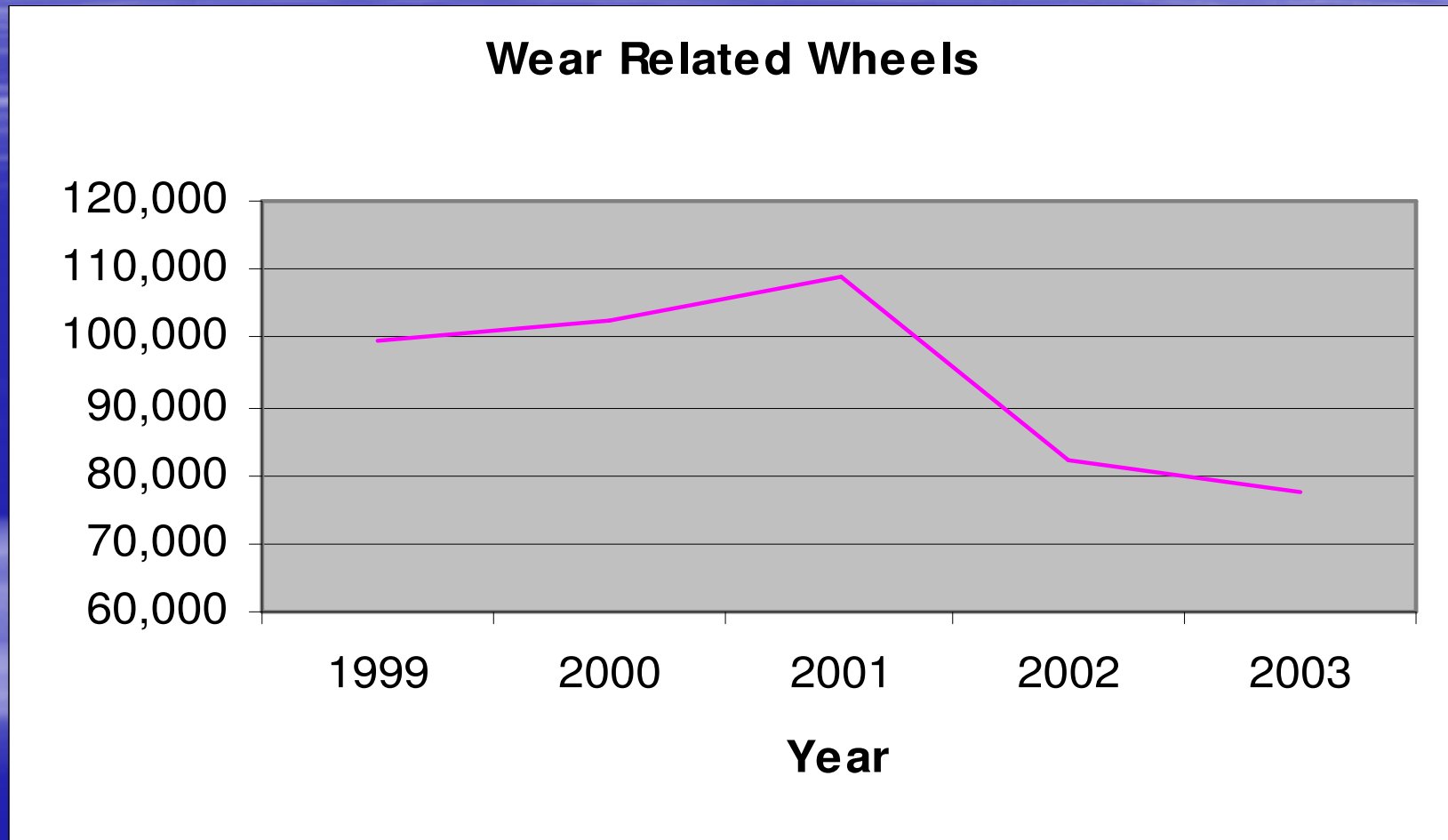
5 Year Trend – Administrative Wheels



Wear Related

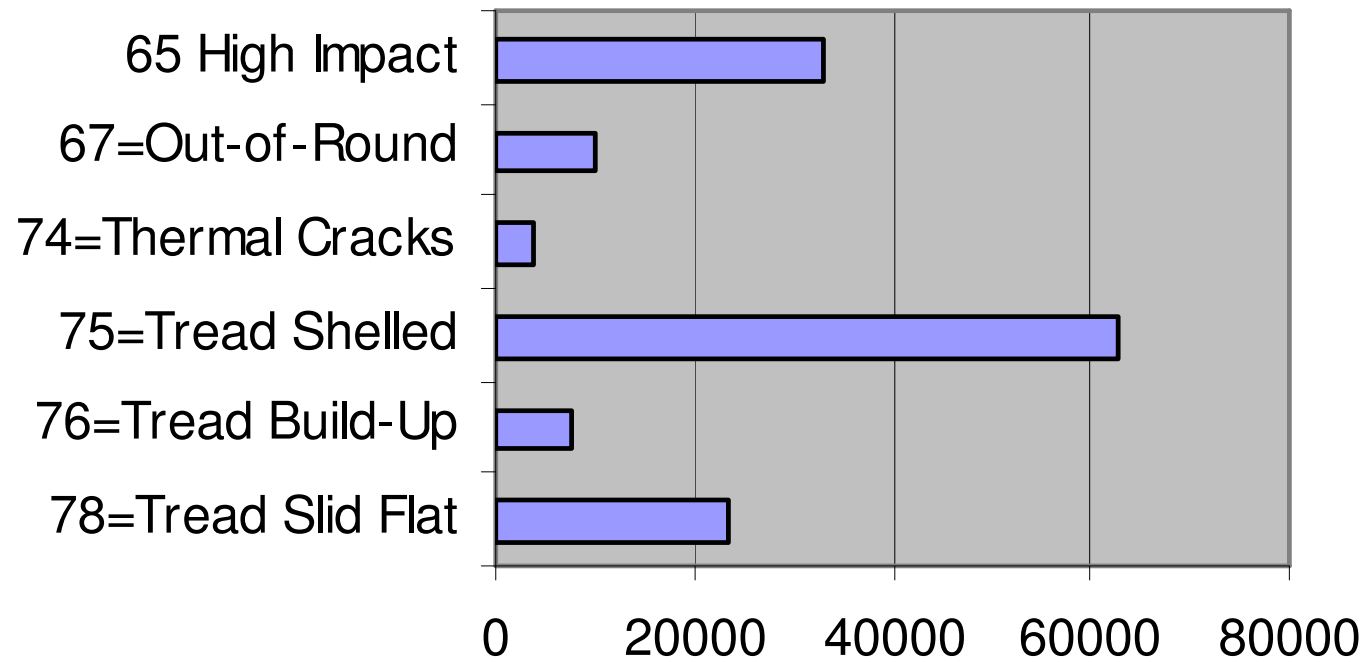


5 Year Trend – Wear Related Wheels

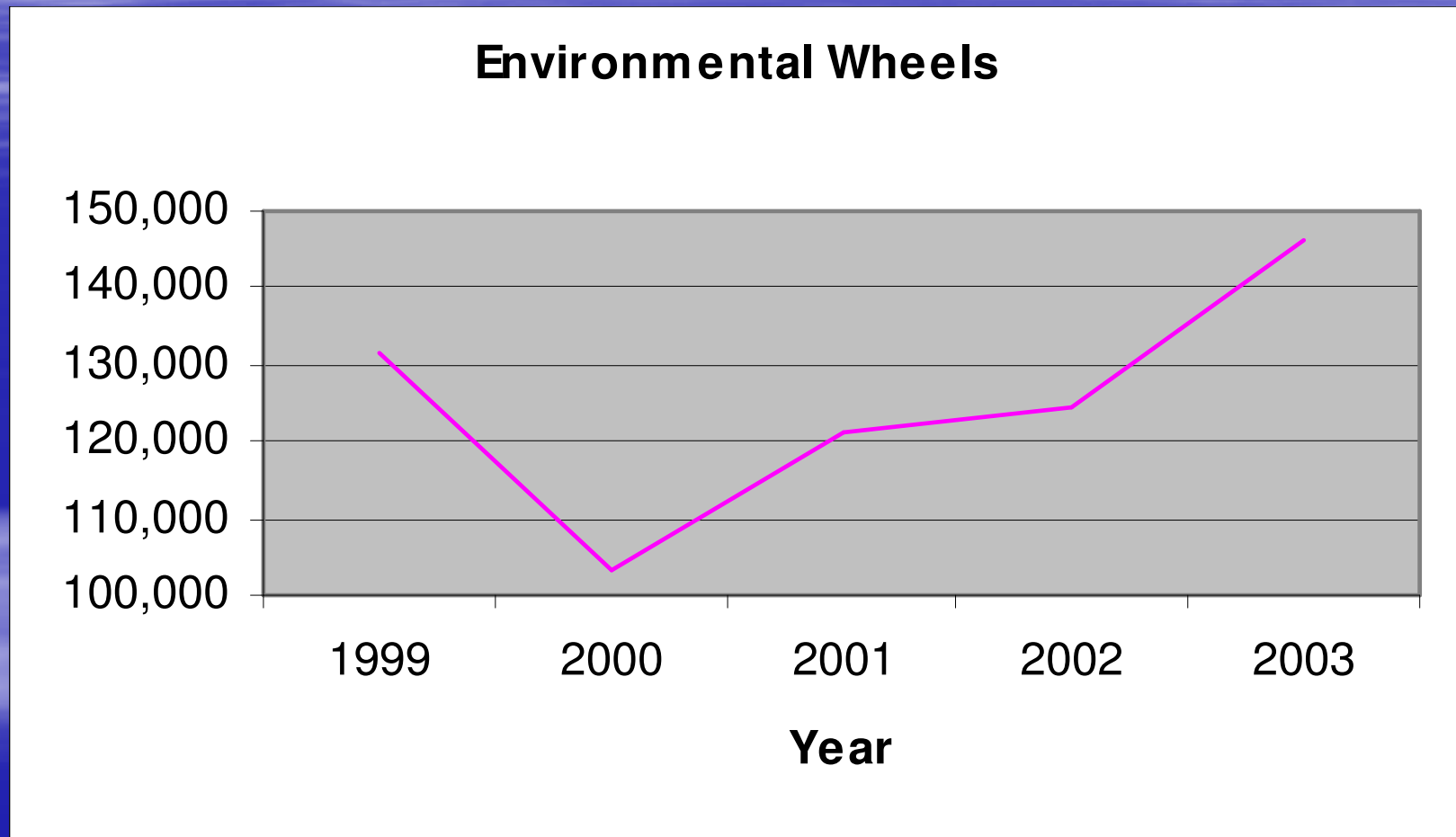


Environmental

Environmental (28.53%)



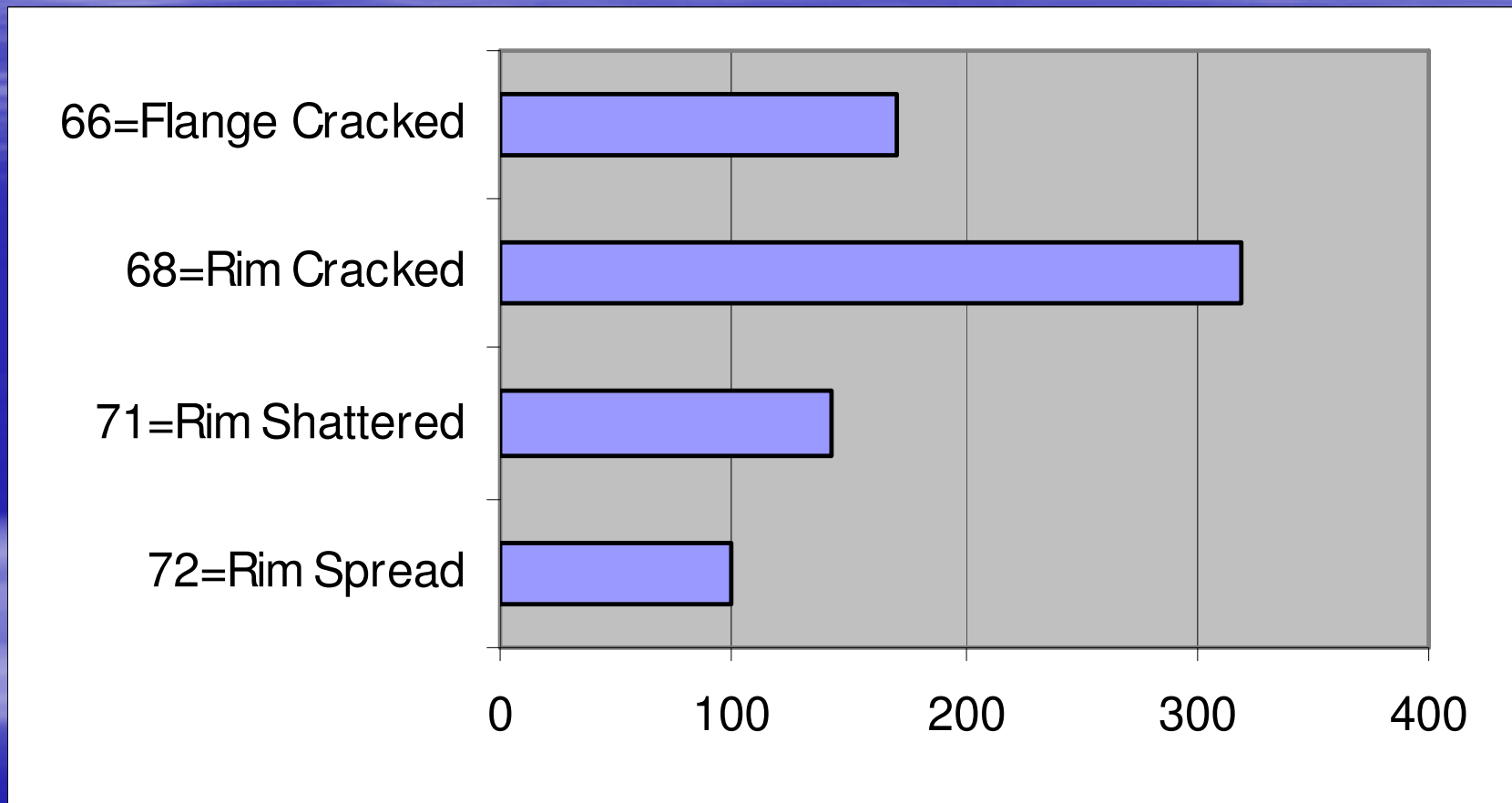
5 Year Trend- Environmental Wheels



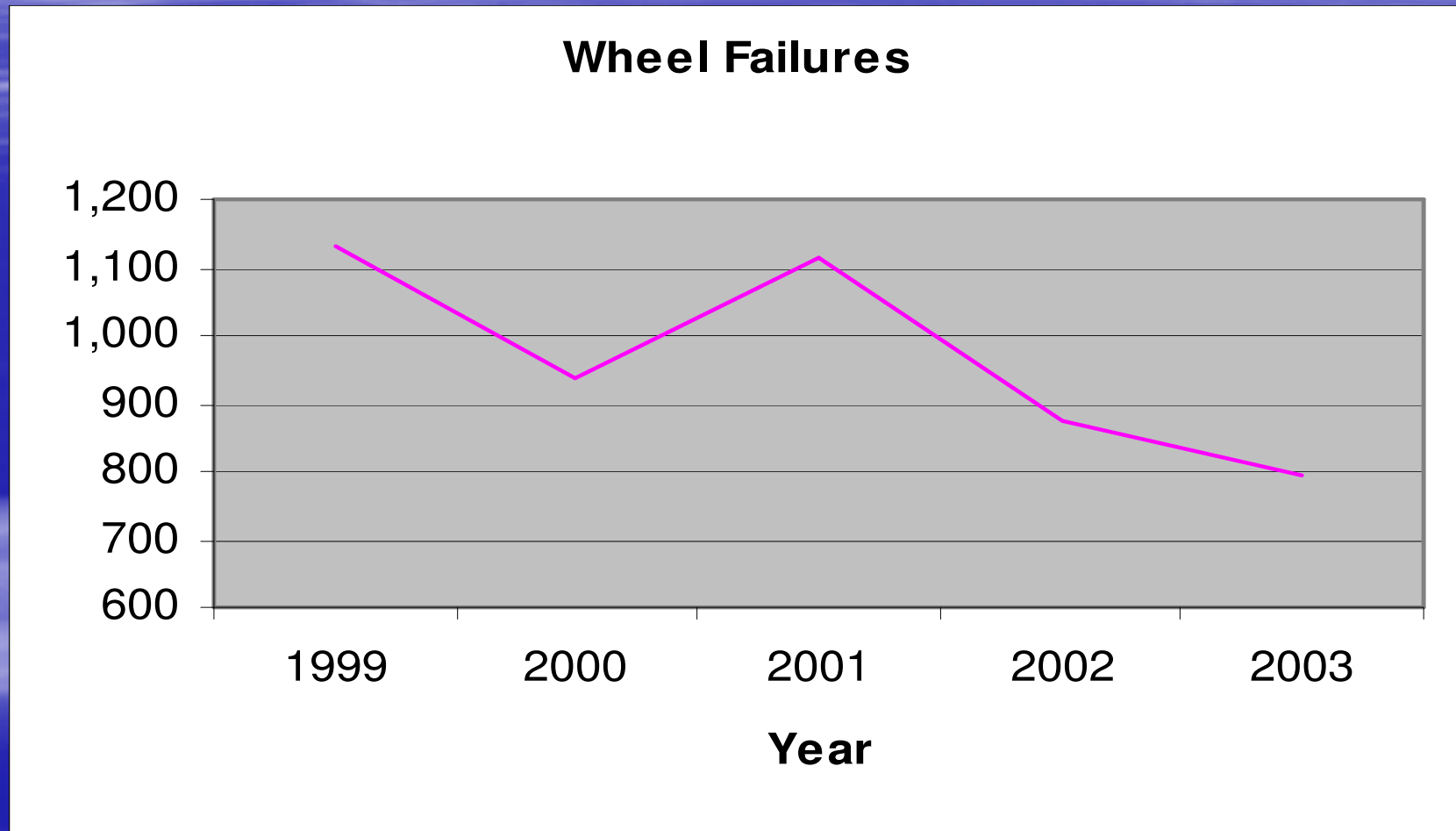
Cause for Removal

- 3 Most Frequent Cause for Removal of Environmental Wheels
 - Shelled
 - High Impact
 - Slid Flat

Wheel Failures



5 Year Trend – Wheel Failures



Extrapolation

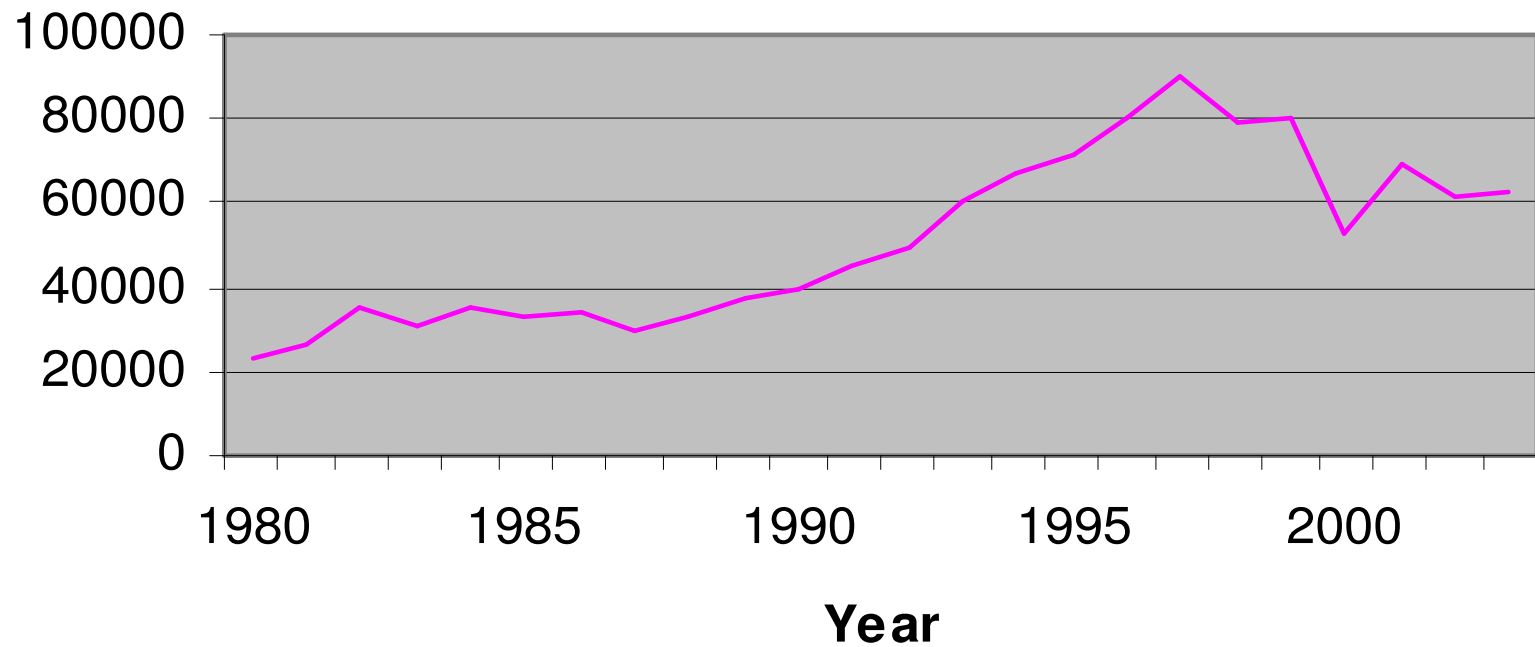
- We have problems extrapolating AAR data to cover the railroad industry. Repair information for some cars in the railroad industry is not the same as repair information supplied to the AAR CRB Program.

Total Car Repair Billing

**\$1.25 to \$1.8
Billion**

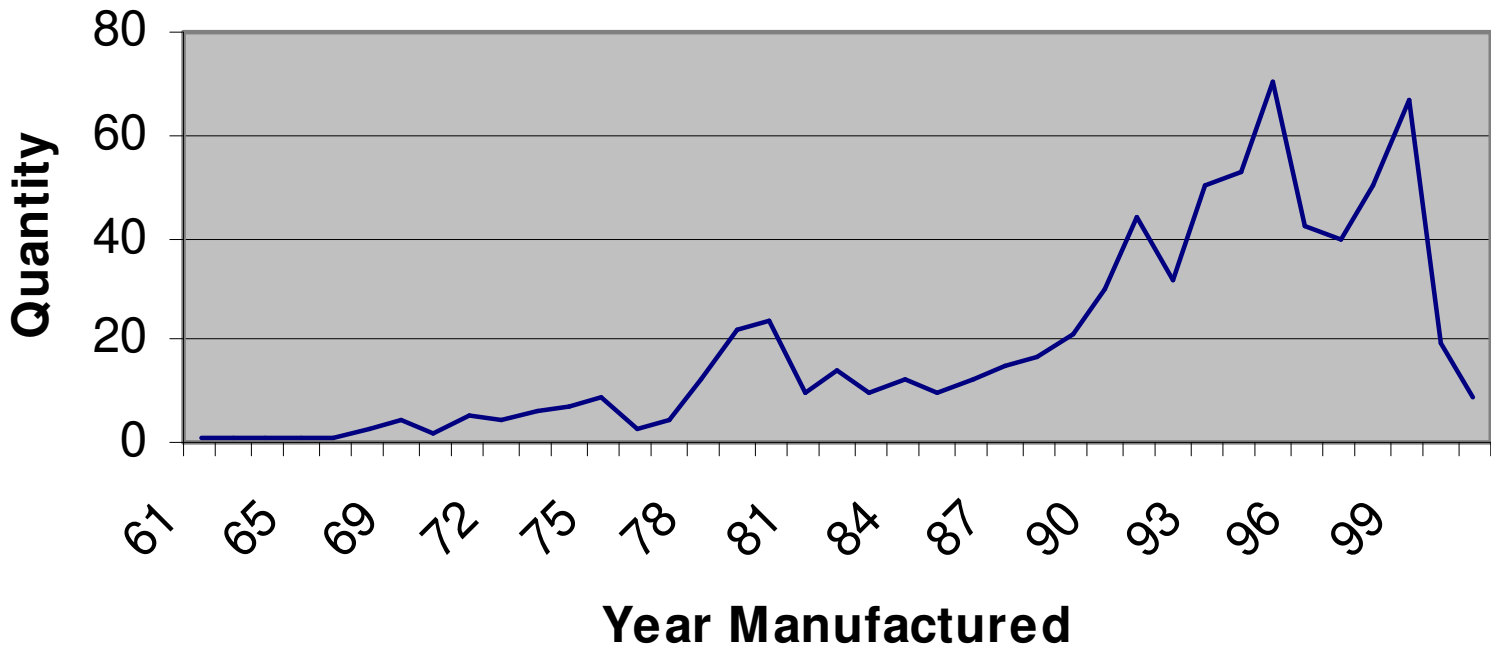
24-Year Trend Shell/Spall Wheels

Shelled/Spalled Wheels



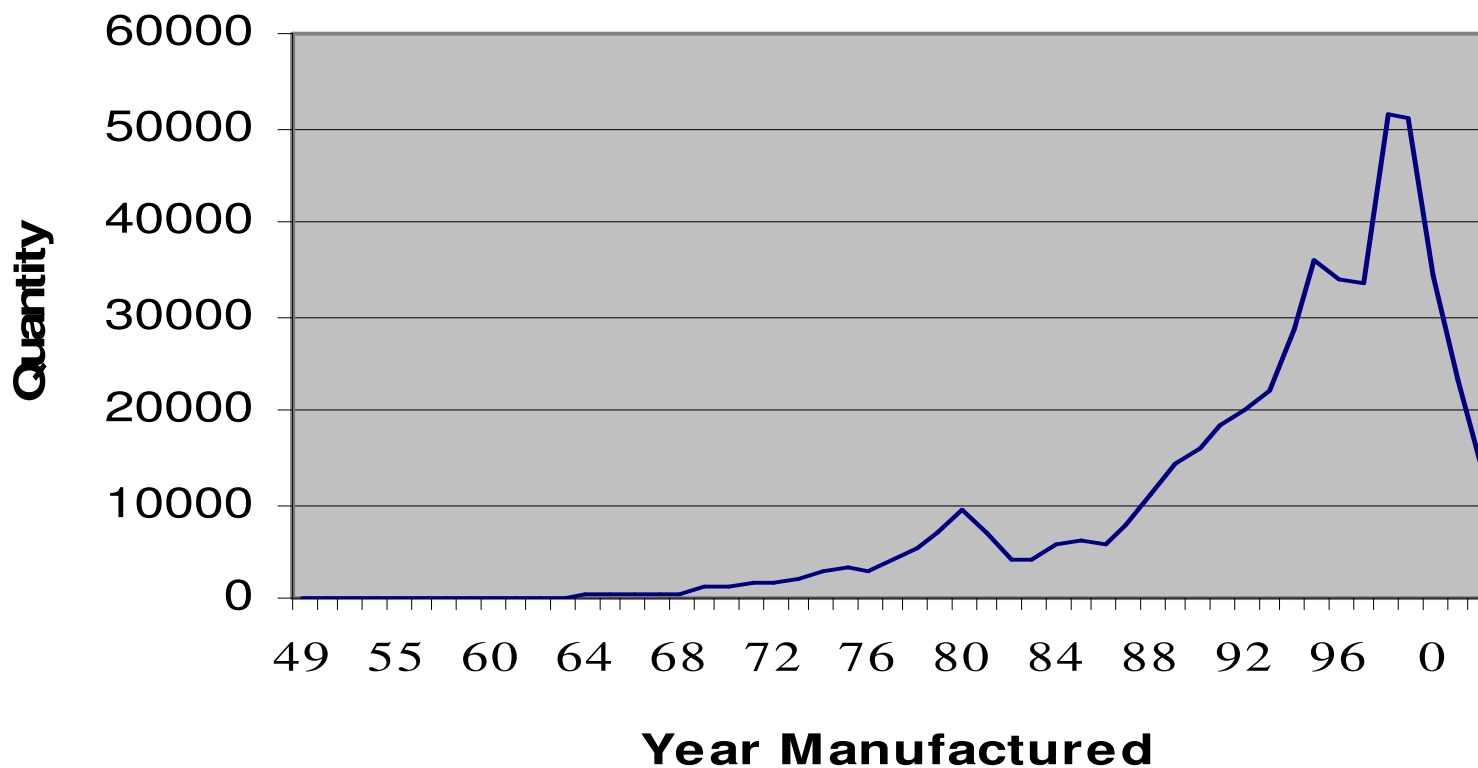
Distribution of Failed Wheels by Year

2003 Wheel Failures by Year Manufactured



Wheel Removals by Year Manufactured

2003 Wheel Removals by Year Manufactured



Average Wheel Life/Category

- Administrative 11 Years
- Wear Related 14 Years
- Environmental 9.3 Years
- Wheel Failure 12.6 Years

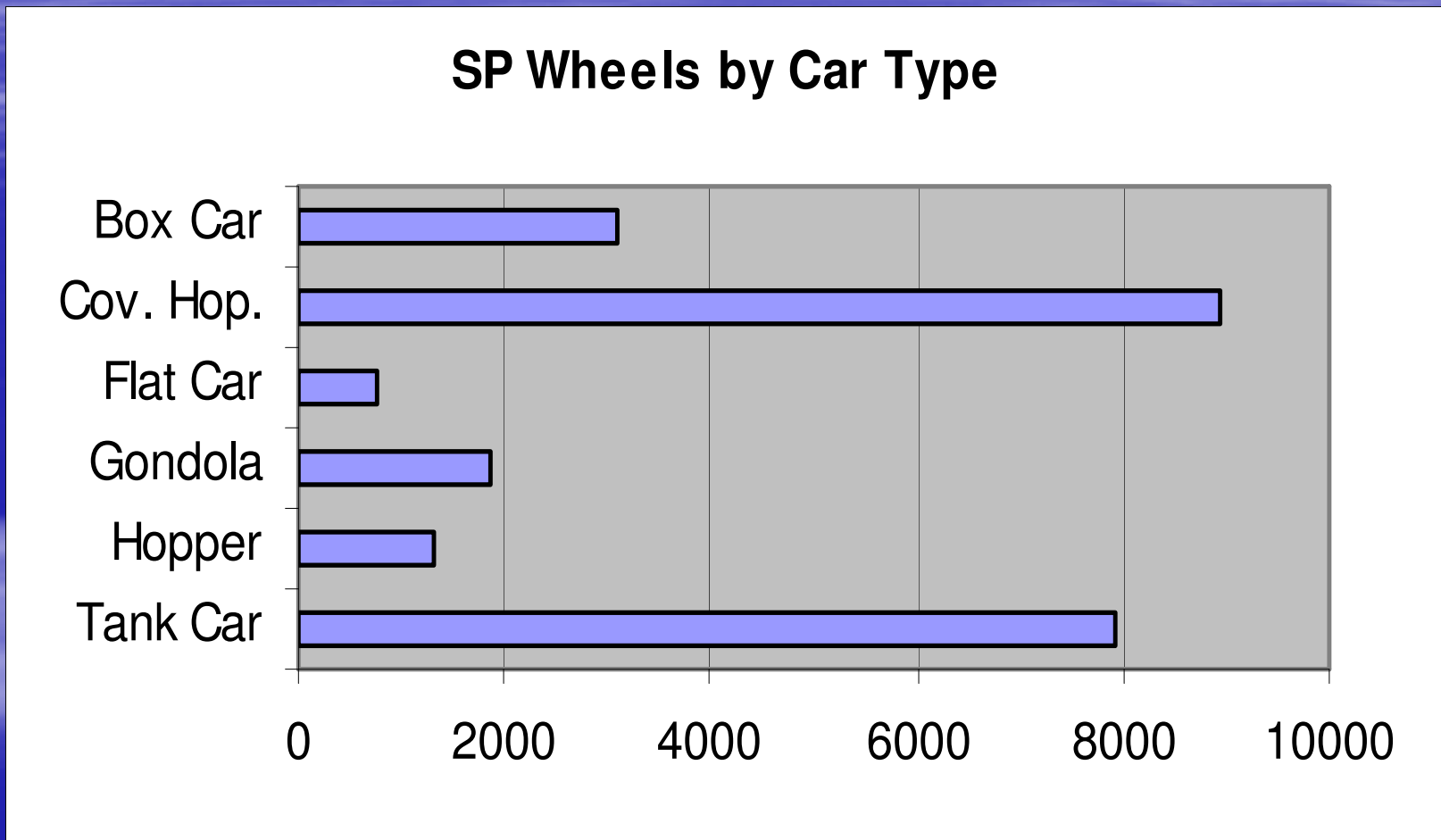
Average Wheel Life/Car Type

Type of Car	Wheel Life, Years
■ Box	12.9
■ Gondola	9.0
■ Hopper	10.0
■ Covered Hopper	12.4
■ Tank	13.7
■ Flat	9.1
■ Articulated	6.1

Distribution of Wheel Types

Wheel Type	HT-CP	NHT-CP	HT-SP	NHT-SP
AAR Raw	86.7%	8.6%	1.5%	3.2%
AAR Accel.	88.8%	8.5%	0.9%	1.8%

Distribution of SP Wheels



RWMEC Recommendations

- Already Implemented
 - accelerate removal of straight plate wheels
 - improving their wheel marking procedures

UT Inspection of Re-profiled Wheels

- Effective January 1, 2003
- Inspected in Radial Direction
- Improve Railroad Safety
- Similar to UT Inspection for New Wheels

Distribution of Wheel Types

Wheel Type	HT-CP	NHT-CP	HT-SP	NHT-SP
Failed Wheels	80%	12%	2%	6%
Wheel Type	HT-CP	NHT-CP	HT-SP	NHT-SP
AAR Raw	86.7%	8.6%	1.5%	3.2%
AAR Accel.	88.8%	8.5%	0.9%	1.8%

Calculations

- **NTCP wheels make up approximately 8.5 % of the population**
- **NTCP wheels make up approximately 12% of the failed wheels**
- **The percentage of failed wheels is almost fifty percent greater than the percentage of NTCP Wheels in service**

RWMEC Recommendations

- **Improve air brake testing methods.**
- **Train employees about the proper use of hand brakes.**

Comparisons

- Removals for shelling and high impact are more common for 36-inch and 38-inch wheels.
- 36-inch wheels have a higher percentage of wheels removed for slid flat, thin flange, built-up-tread and out-of-round.

Comparisons

- Covered Hopper Cars have the most wheels for all causes.
- Tank cars and covered hopper cars have the most wheel removals for shelling

Future

- Wheel manufacturers continue to revise their wheel designs and process controls
- RWMEC continues to review information from the CRB database

THANKS

- RWMEC thanks the AAR for providing 2003 wheel repair data for this analysis and report.
- RWMEC thanks the Railway Supply Institute for the opportunity to present this information at the 2004 RSI conference.