



Tridem Drive Tractors: Research & Operational Experience



**Forest Engineering Research
Institute of Canada - Vancouver, BC**

FERIC's Tridem Research

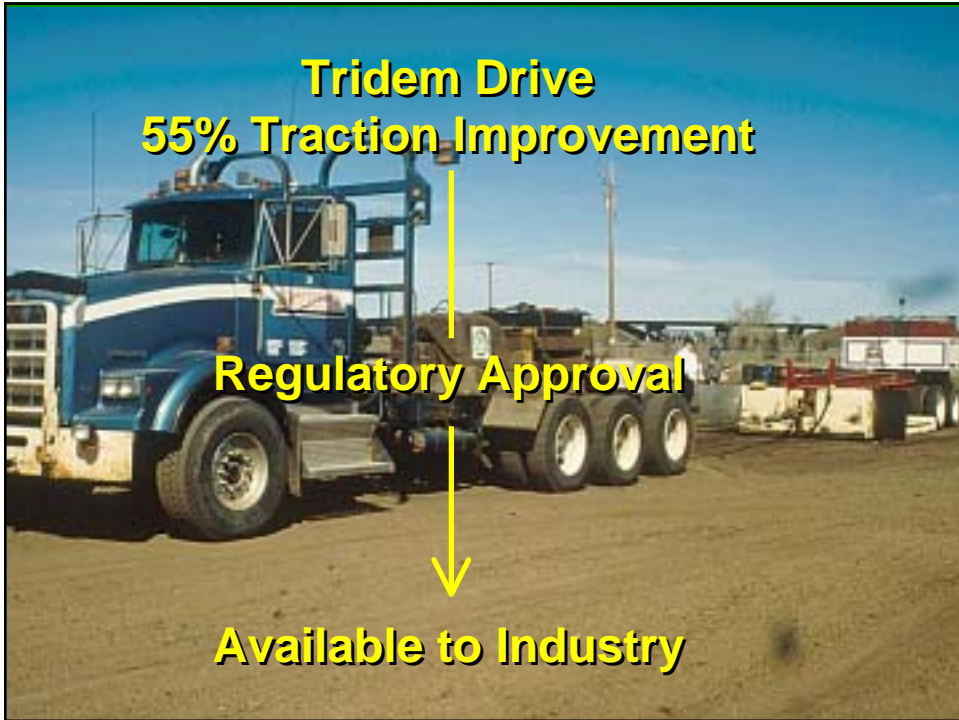
- **Started in 1990**
- **Initially undertaken to address mobility challenges**
- **Steering / vehicle dynamics**
- **20+ reports**
- **Configurations with tridem drive now approved - BC(8) Alberta(9)**





Evolution of Western Canadian Log Truck Configurations



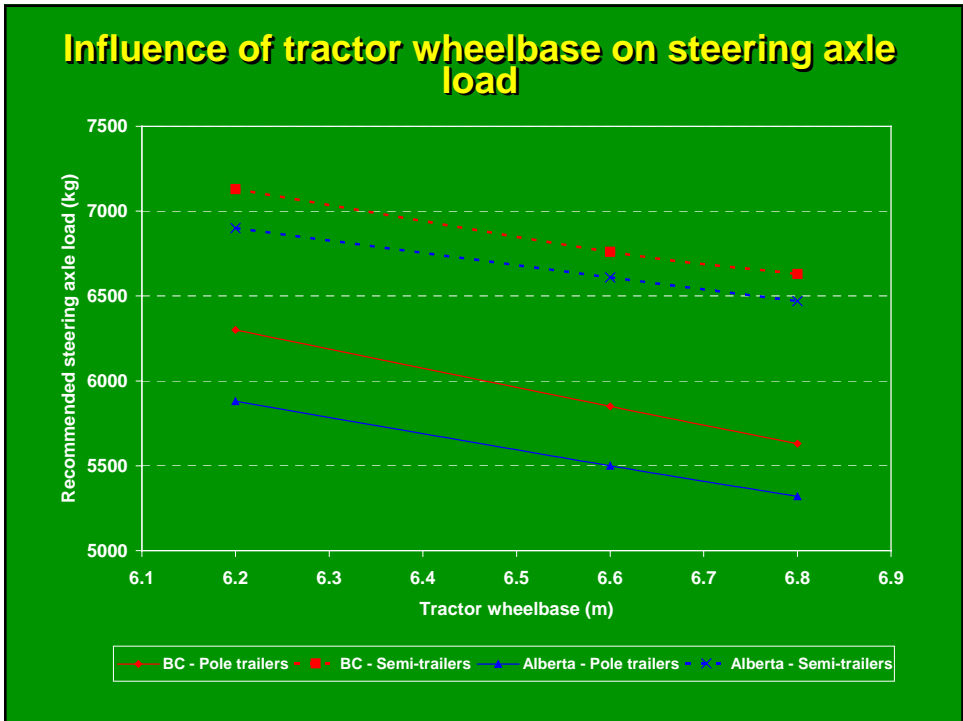
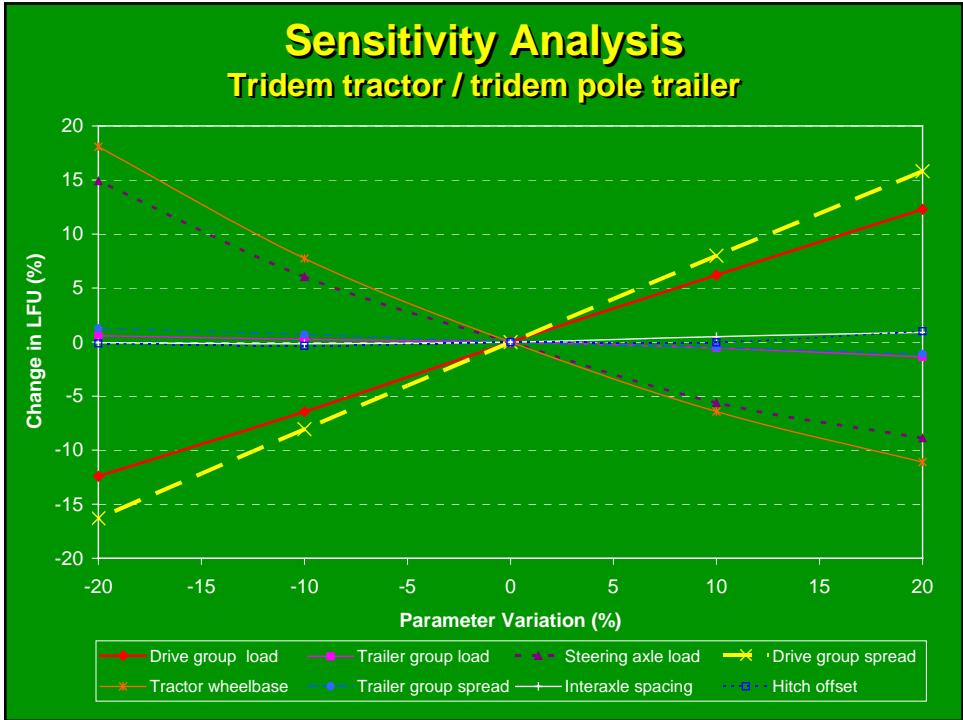


Development of Steering Performance Measure: Lateral Friction Utilization (LFU)

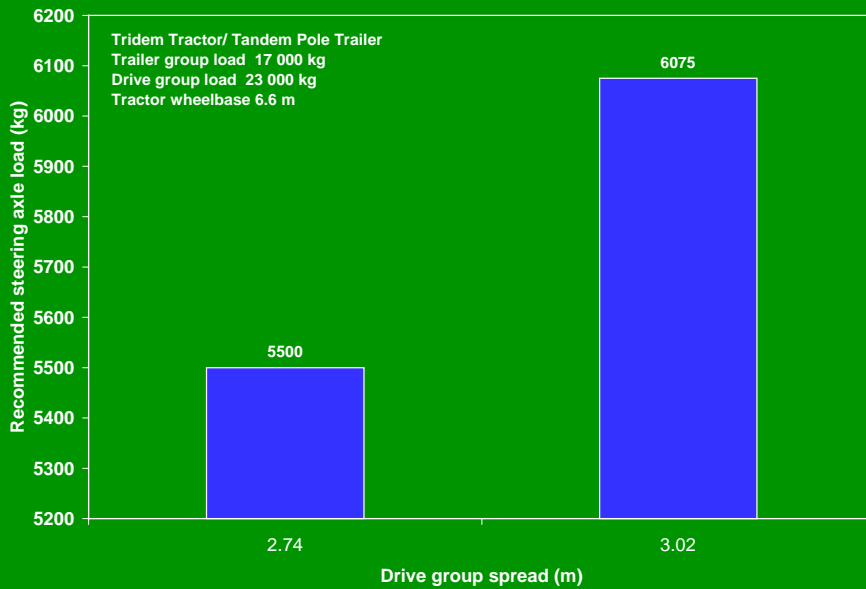


Lateral Friction Utilization

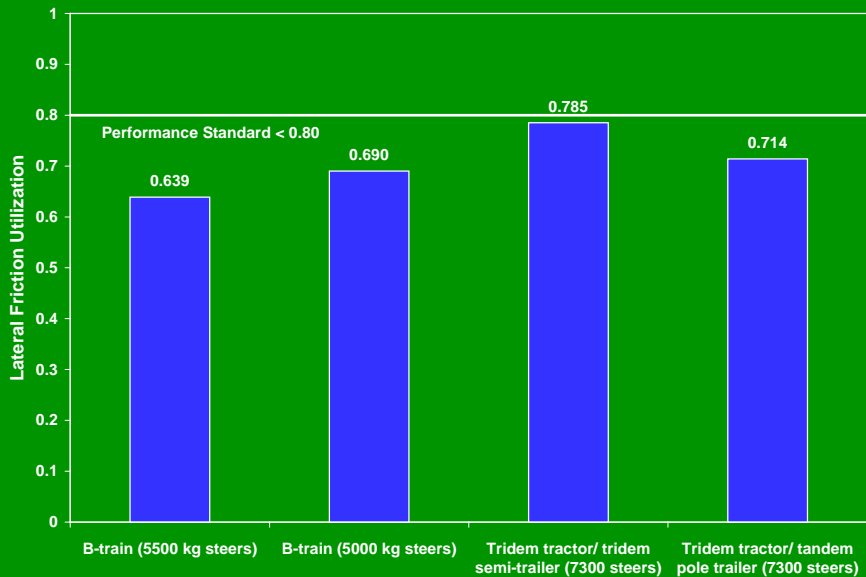
$$\frac{\text{Side Force at Steering Tires}}{\text{Vertical Load on Steering Tires}} \times \frac{1}{\text{coef of adhesion}} \leq 0.8$$



Influence of drive group spread on steering axle load



Lateral friction utilization of selected configurations



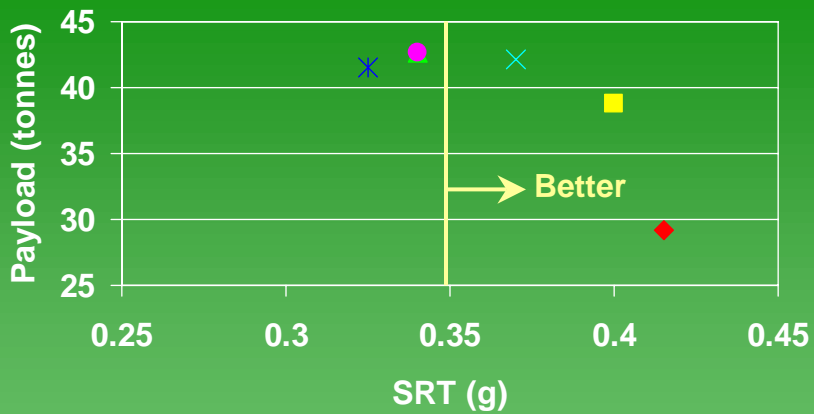
**Steering tests
conducted by
B.C. Gov't**



**Vehicle
Dynamic
Analyses**



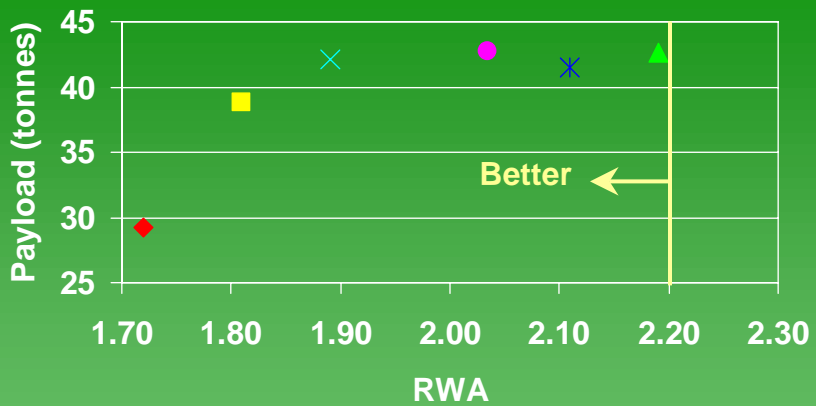
Static Rollover Threshold



◆ 5 Axle ■ TRI/TRI ▲ TAJ × QUAD ✕ DDOG ● TAJJP/TR



Rearward Amplification



◆ 5 Axle ■ TRI/TRI ▲ TAJ × QUAD ✕ DDOG ● TAJP/TR

Load Transfer Ratio



- ◆ 5 Axle
- TRI/TRI
- ▲ TAJ
- × QUAD
- × DDOG
- TAJJP/TR



B-Train trials begin in Alberta: 1995 / 96

**Use with pole trailers approved
in Alberta - 1996**



**Use with pole trailers approved
in BC – October 1997**







**Verification of
5th wheel
offset limits**







