Establishing Best Practices for Wheel/Rail Interaction

APTA/AREMA Working Group on Wheel-Rail Interaction

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(LTK Engineering)

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APTA - AREMA WRI Mission

Mission & Scope

- To facilitate and coordinate the development, dissemination, refinement and maintenance of best practices, recommended practices, specifications and standards associated with wheel / rail interaction
- Original focus on Passenger & Commuter Railroads
- Broadened scope beyond this to include TA's, Freight

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Topics under consideration

- Predicting w/r wear
- Vehicle suspension influence on WRI
- Track geometry error influence on WRI

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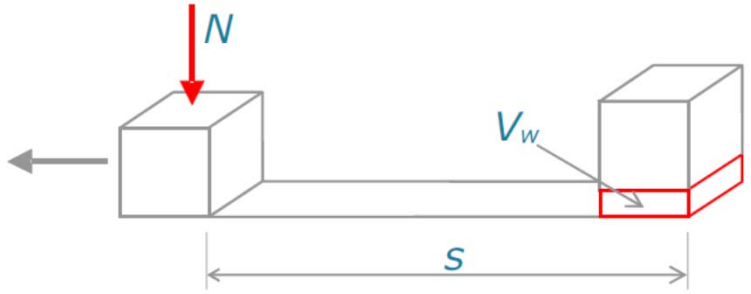
- W/R Wear Prediction – are we there yet?



$$V_w = k \cdot \frac{N \cdot s}{H}$$

Locally applied:

$$\Delta z = k \cdot \frac{p_z \cdot \Delta s}{H}$$

V_w	=	volume of wear	[m^3]
s	=	sliding distance	[m]
N	=	normal force	[N]
H	=	hardness	[Pa]
k	=	wear coefficient	[-]

Wear Model – Archard's Wear Equation,

(From Simpack User Meeting March 2006, Bombardier)

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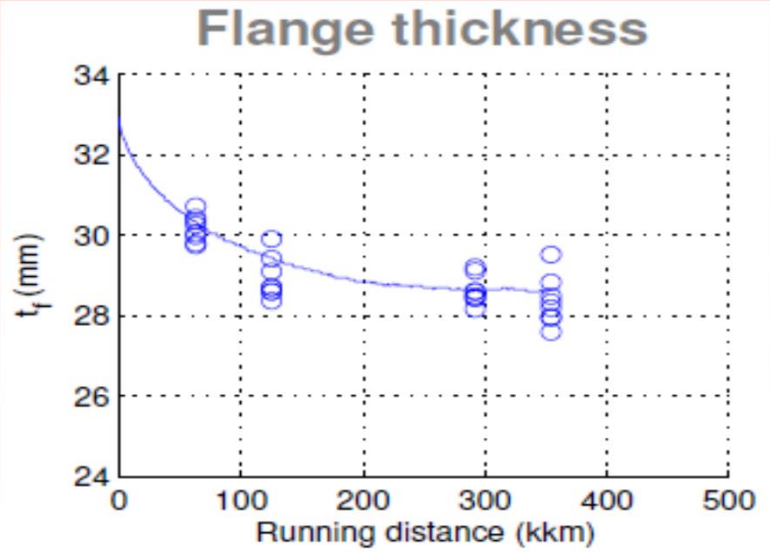
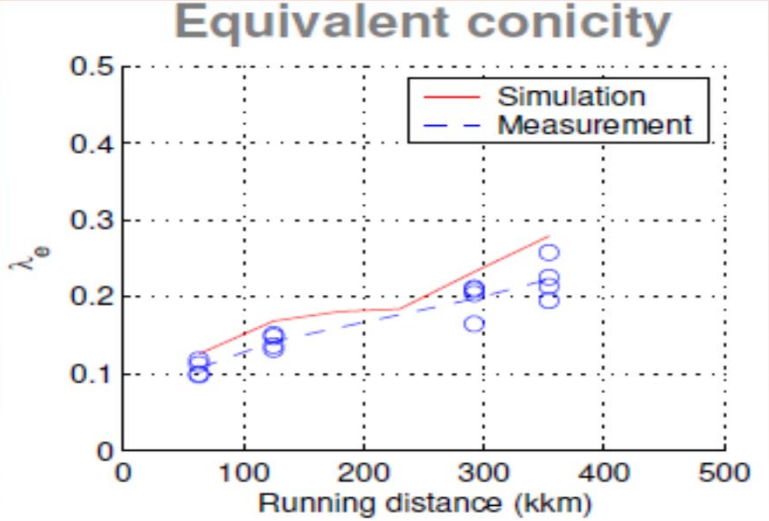
- W/R Wear Prediction – are we there yet?





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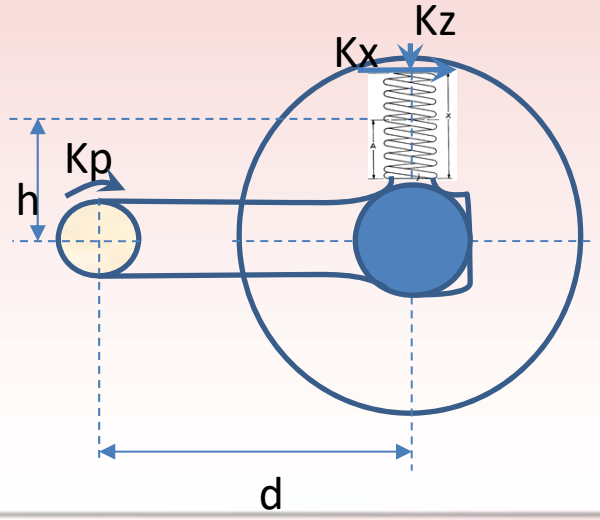
- Vehicle - Effect of suspension on wheel unloading
  - Effective Vertical Stiffness of Primary Suspension with Radius Arm



$K_{Vert\ Eff}$ = 1.5 to 1.7 * (Kz)

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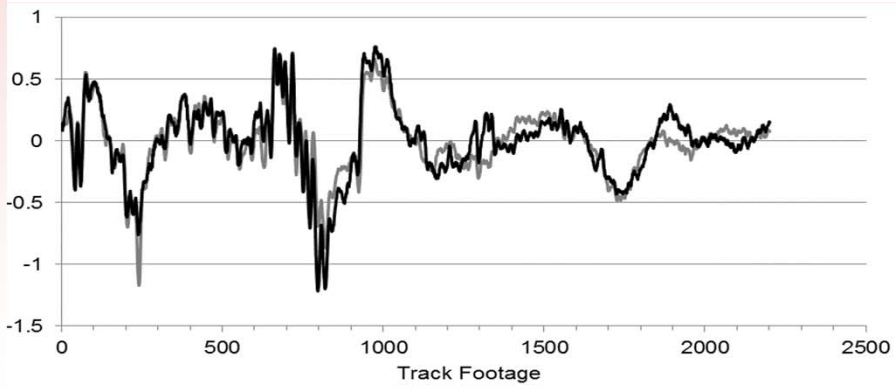
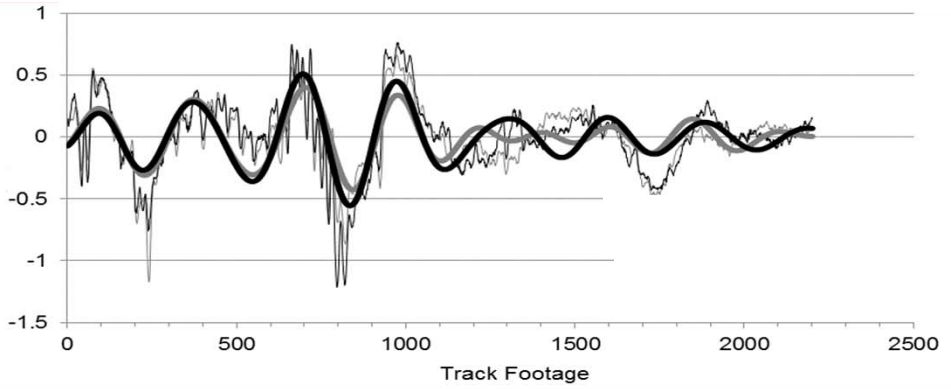
- Track – Cyclic geometry deviations & WRI

Space Curve data from Track Geometry Car



Space Curve data from Track Geometry Car before and after selective filtering



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Two Subcommittees, Practitioners & Researchers & Developers

- **Practitioners Subcommittee is focused on the challenges of day-to-day operations and on more fundamental and practical information.**
- **Researchers and Developers Subcommittee is more concerned with probing technological boundaries and demonstrating new potential capabilities.**

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Please join us!

- **Vice Chairman: Michael Craft, Amtrak**
- **Secretary: Narayana Sundaram, ENSCO**