

# **Predict & Prevent: The future of wheelset management on London Underground**



**London  
Underground**

**22<sup>nd</sup> October 2015**

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- **Formation of WRI Team**
- **Inter Stock Running**
- **09TS Wheel Wear**
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- **Predict & Prevent**
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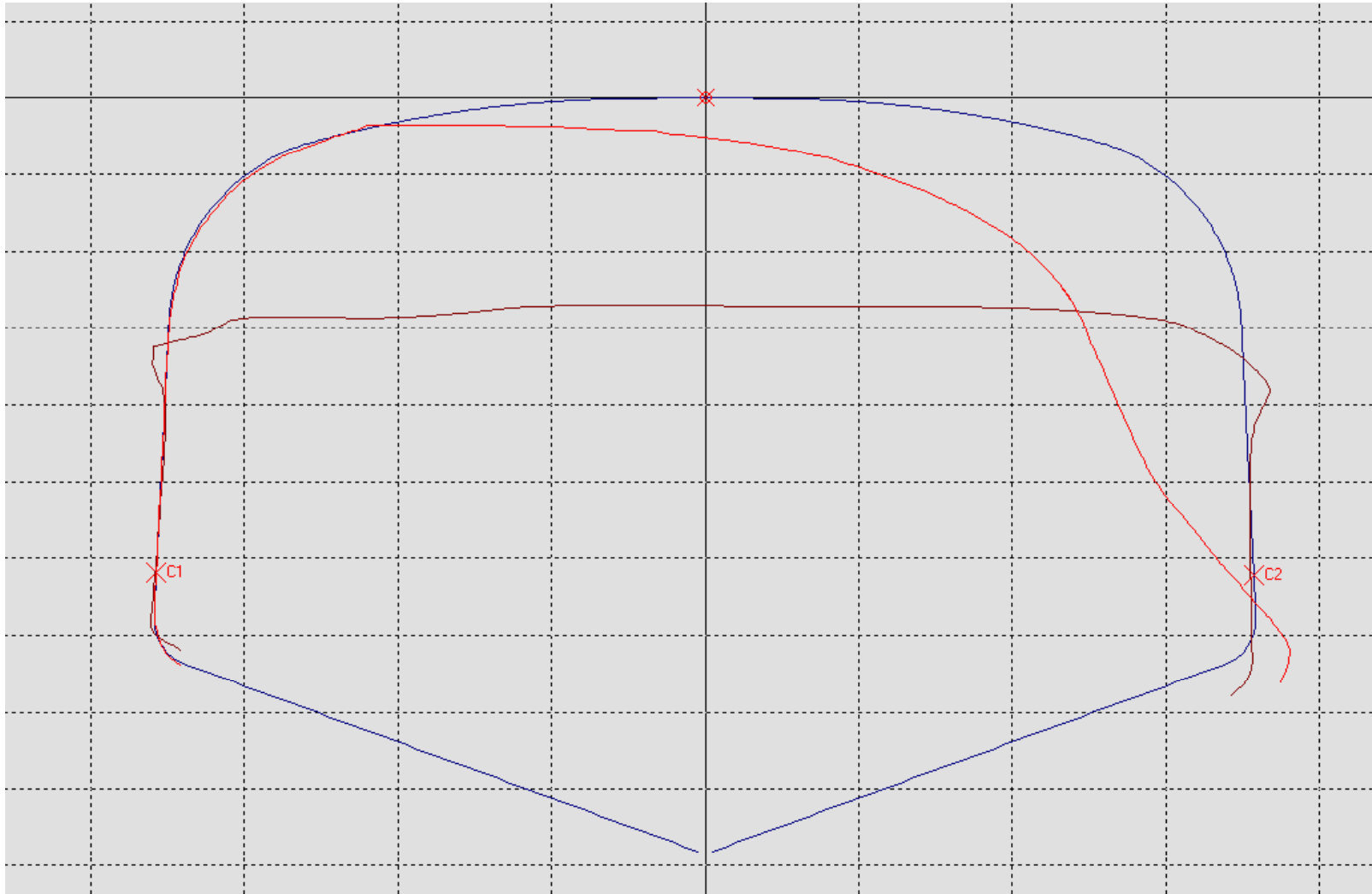
# Westminster



# Rail Wear



# Rail Wear





# Friction Measurements



# Inter Stock Running





# Track Based Lubricators





## C-Stock Underframe

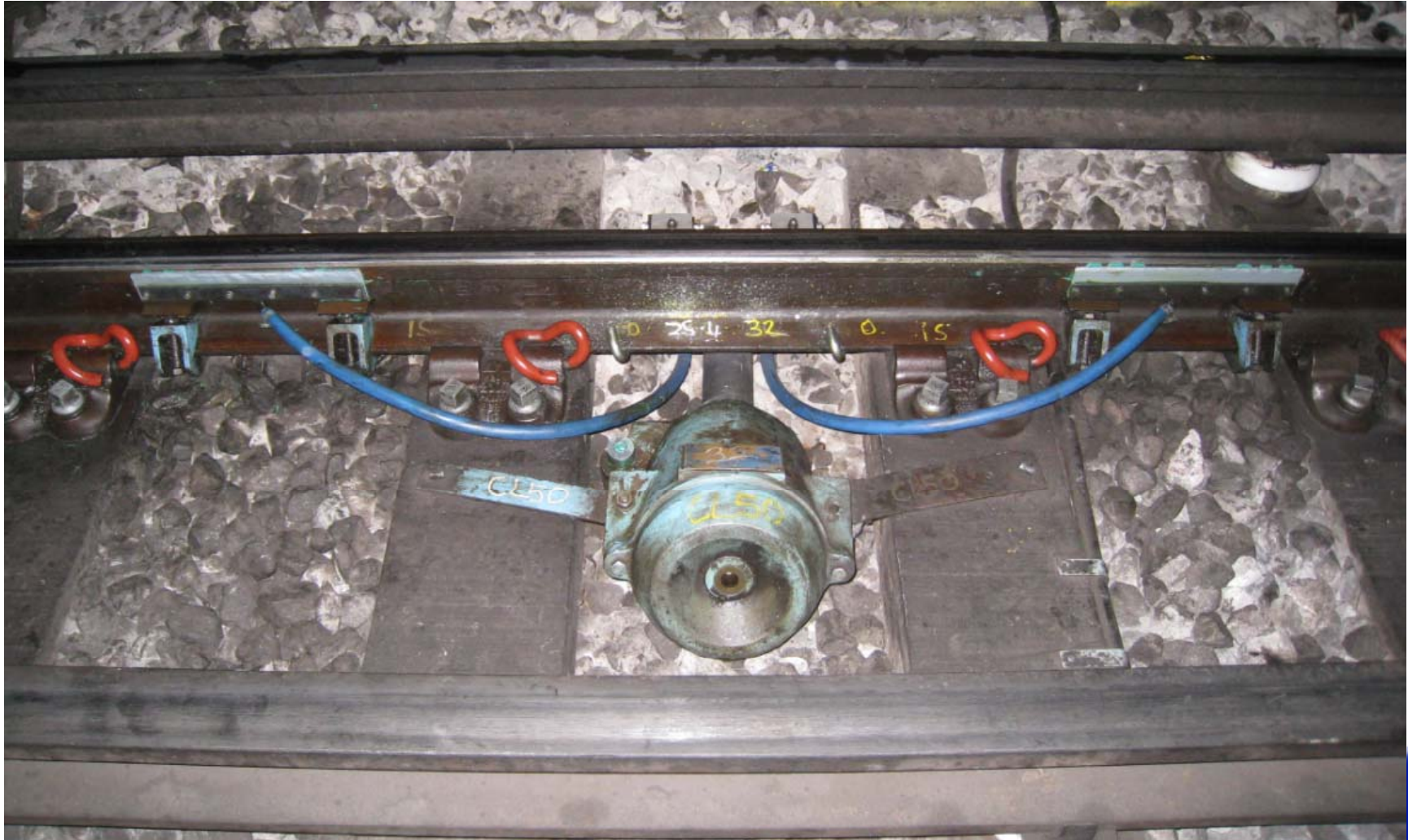


# Wheel Flats/Cavities



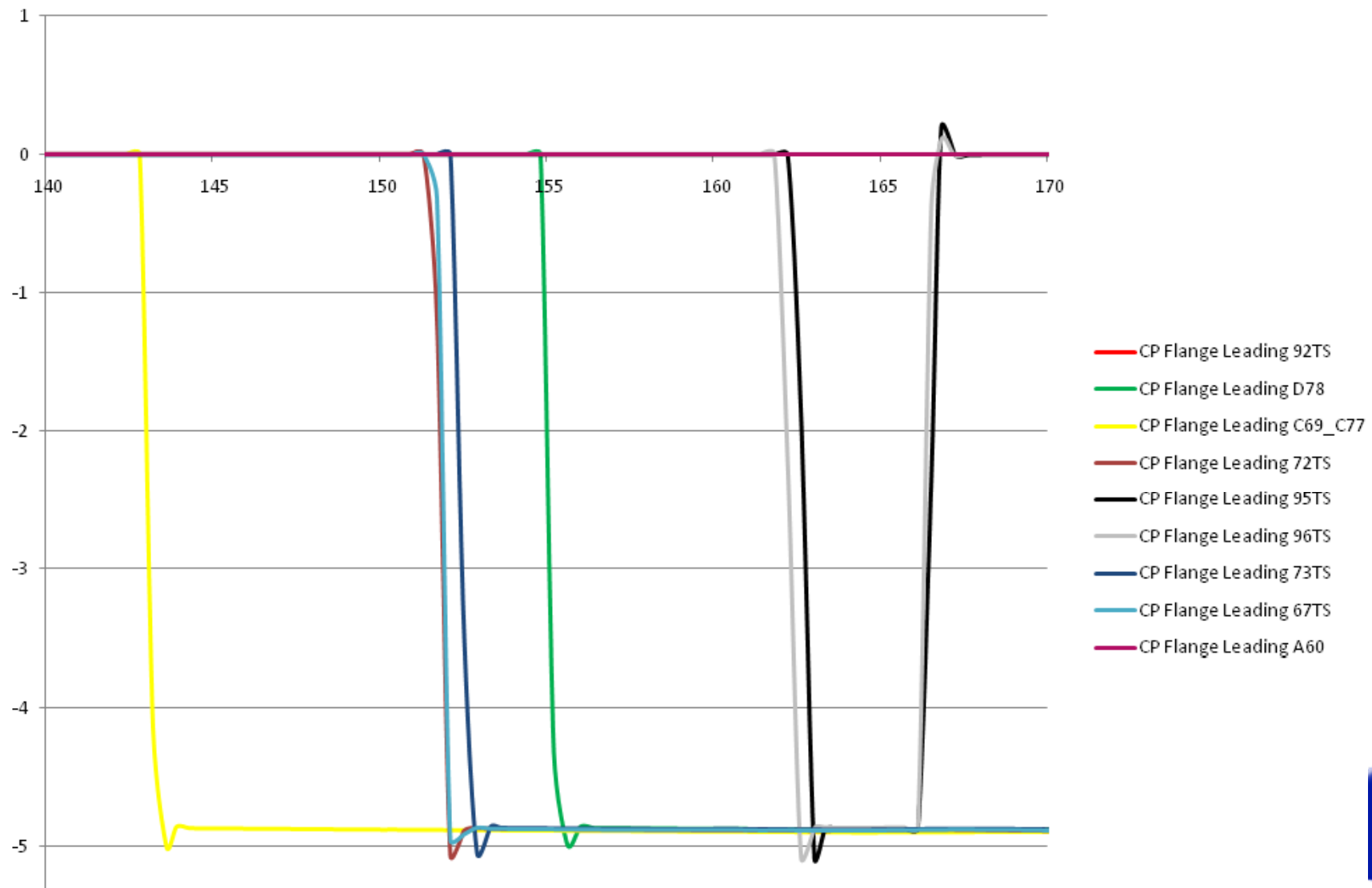


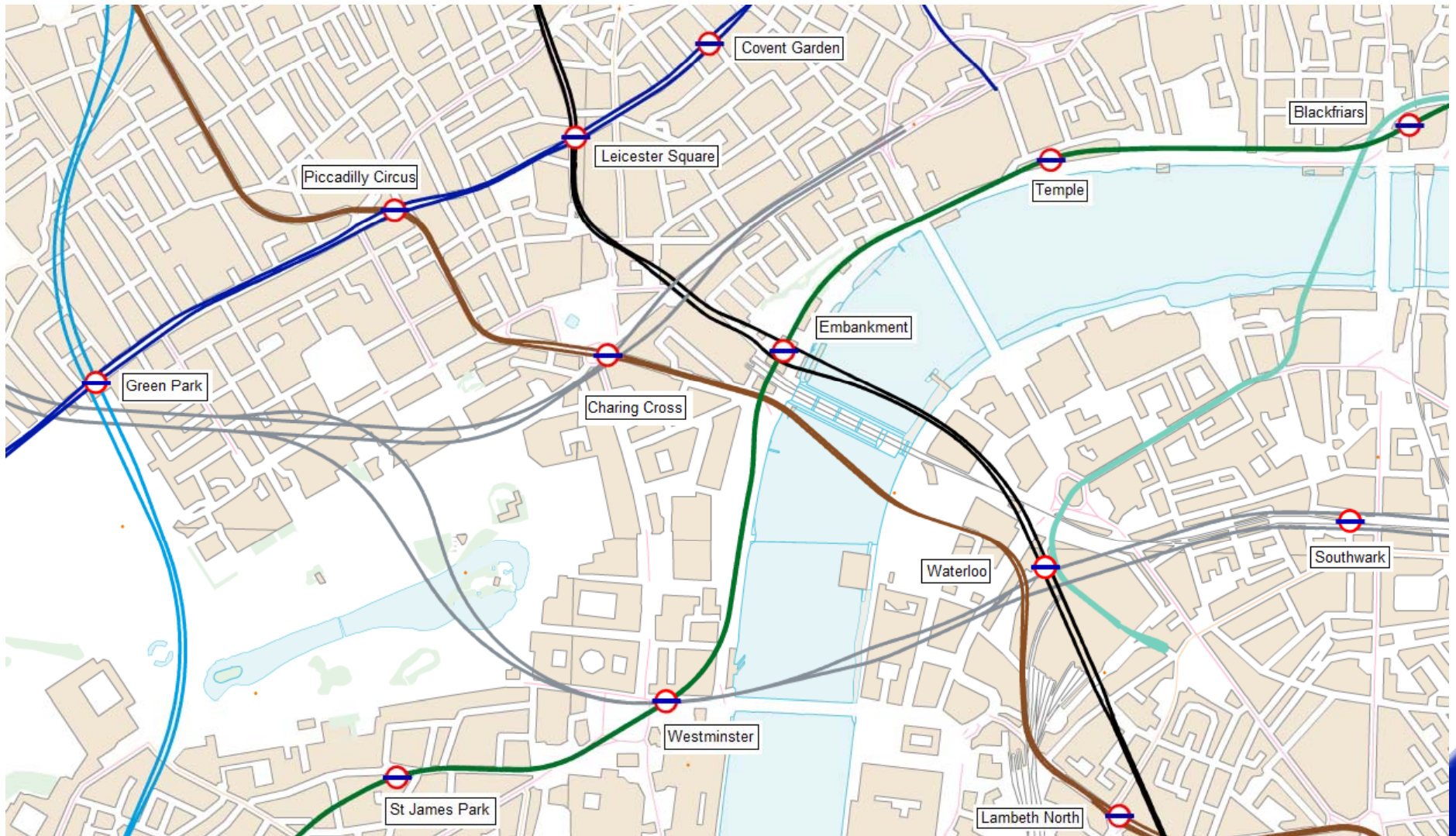
# Green Grease Trial



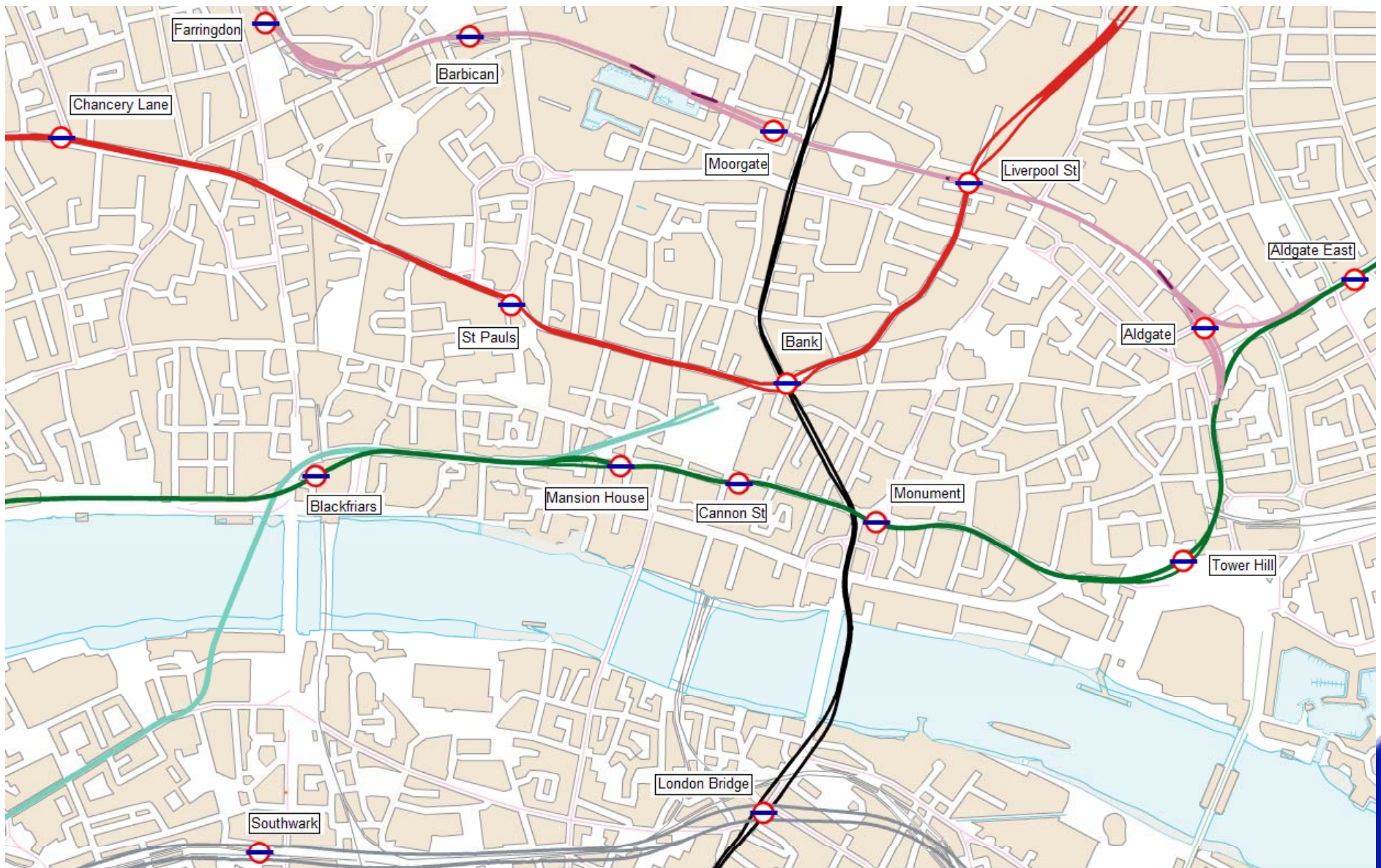


# Curving Performance







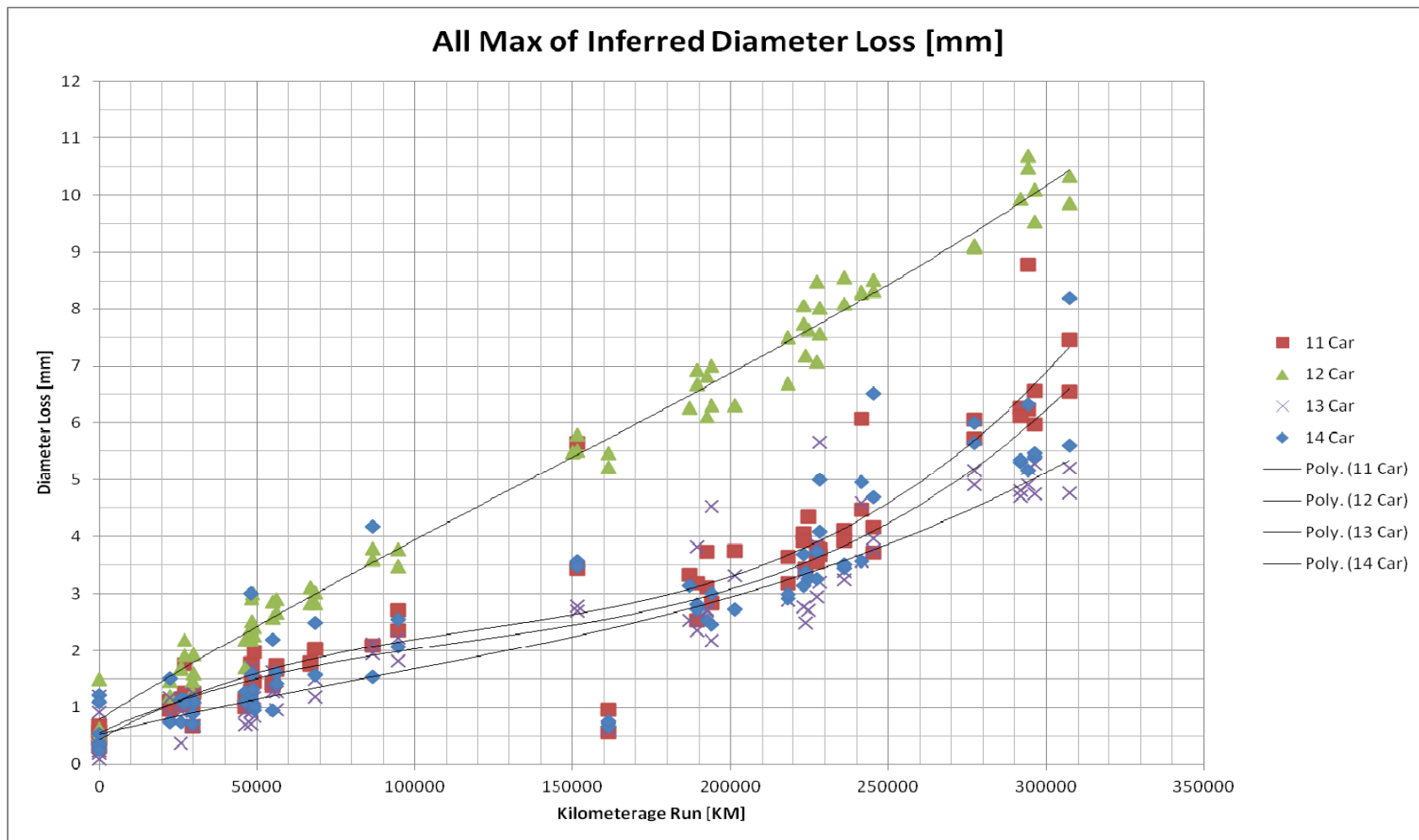




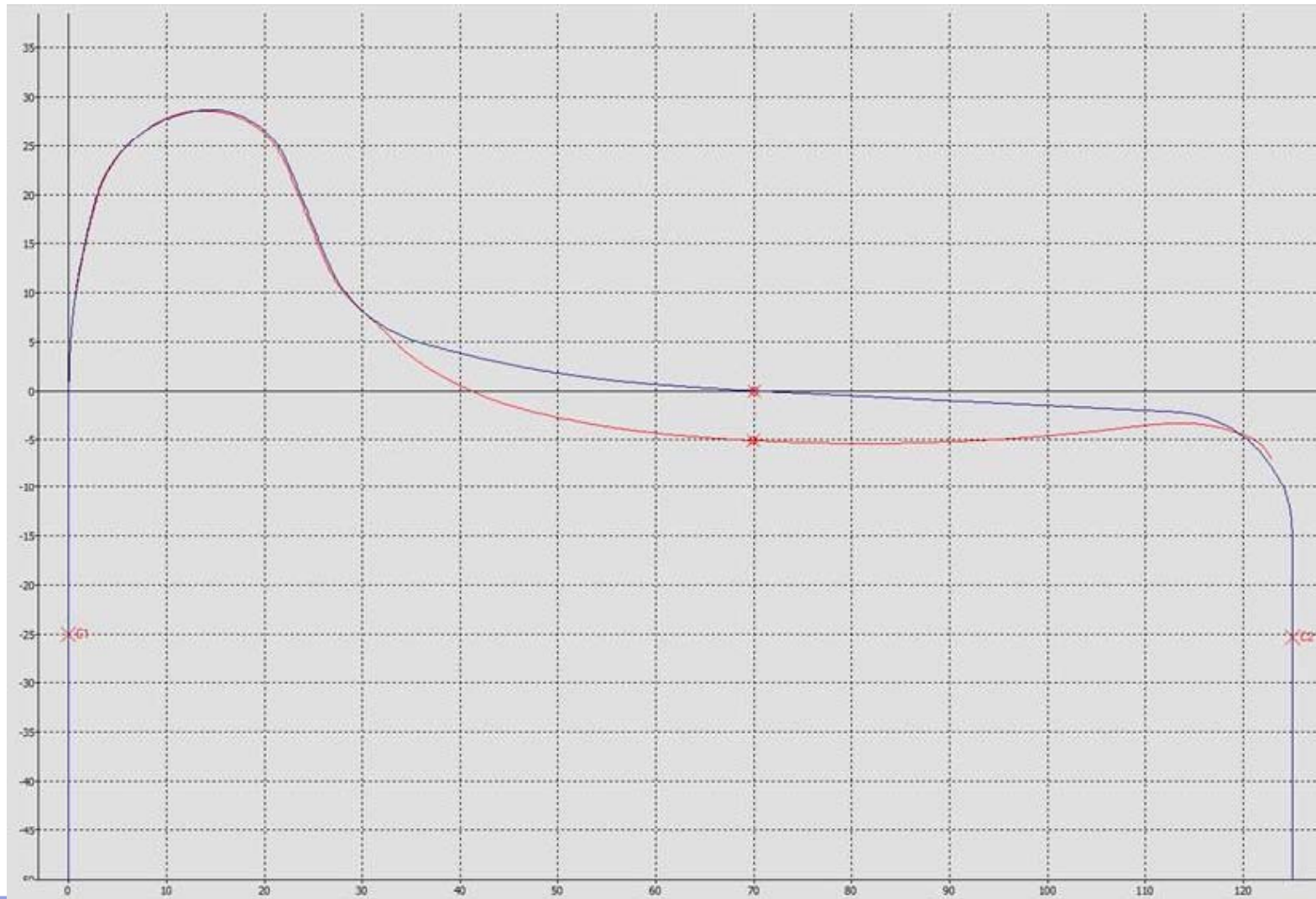
## 09 Tube Stock



# 09TS Wheel Profile Results

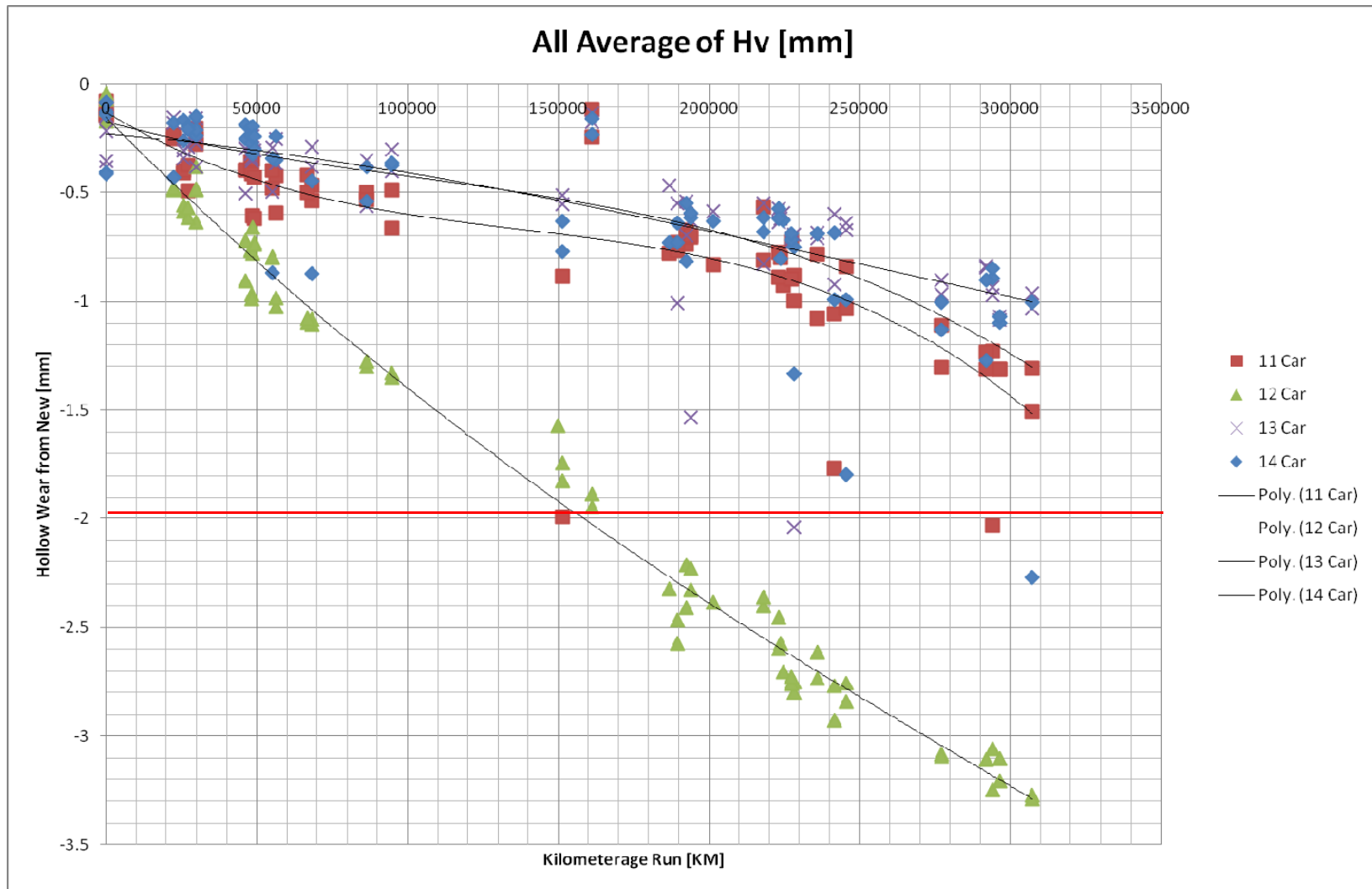


# Hollow Tread





# 09TS Wheel Profile Results

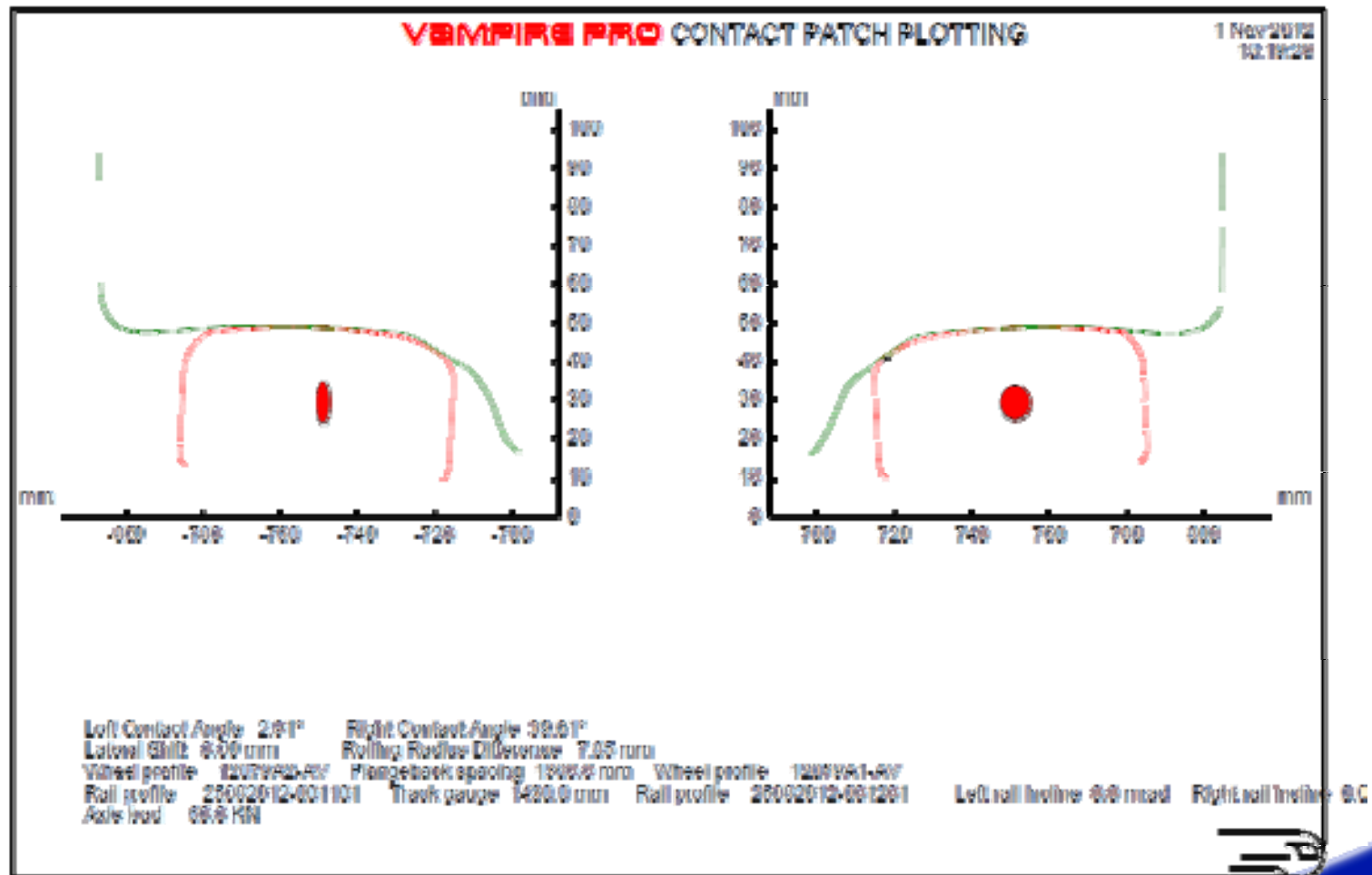


# Condition Turn Status

Stock	Line	Predicted Turn Interval (km)	Confidence	Comments
S8	Metropolitan	180k	Medium	Further data capture required, programmed as part of wider S-Stock exercise for 6 weeks from 7 <sup>th</sup> September 2015.
S7	District/H&C	160k	Medium	Further data capture required, programmed as part of wider S-Stock exercise for 6 weeks from 7 <sup>th</sup> September 2015.
09TS	Victoria	160k	High	Once round of fleet complete. Hollow tread on trailer cars is driver. Overhaul strategy to be determined.
92TS	Central/W&C	TBC	N/A	Miniprof data gathering required and planned for 6 weeks commencing 2 <sup>nd</sup> November 2015.
72TS	Bakerloo	Programme Lift at 2.5 years	High	Lack of wheel lathe means detaching from programme lift interval difficult and this mainly driven by NDT of bogie frames.
73TS	Piccadilly	TBC	Medium	Currently 2 year condition turn interval. Data capture to confirm wear rate.
95TS	Northern	TBC	N/A	Unknown at present time.
96TS	Jubilee	TBC	Medium	Currently annual condition turn interval. Data capture to confirm wear rate.



# Vampire Analysis

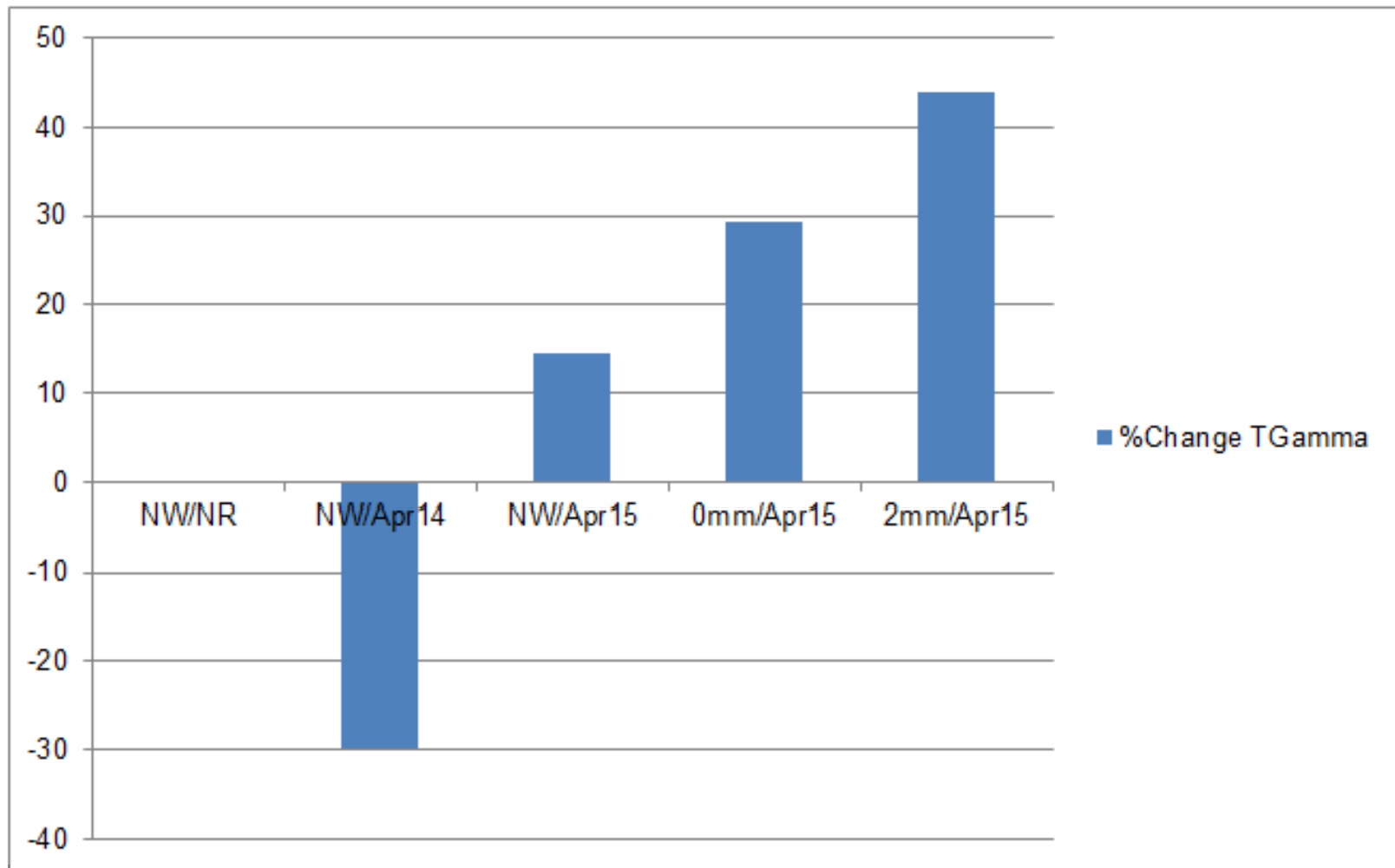


VAMPIRE Plot





# Damage Change

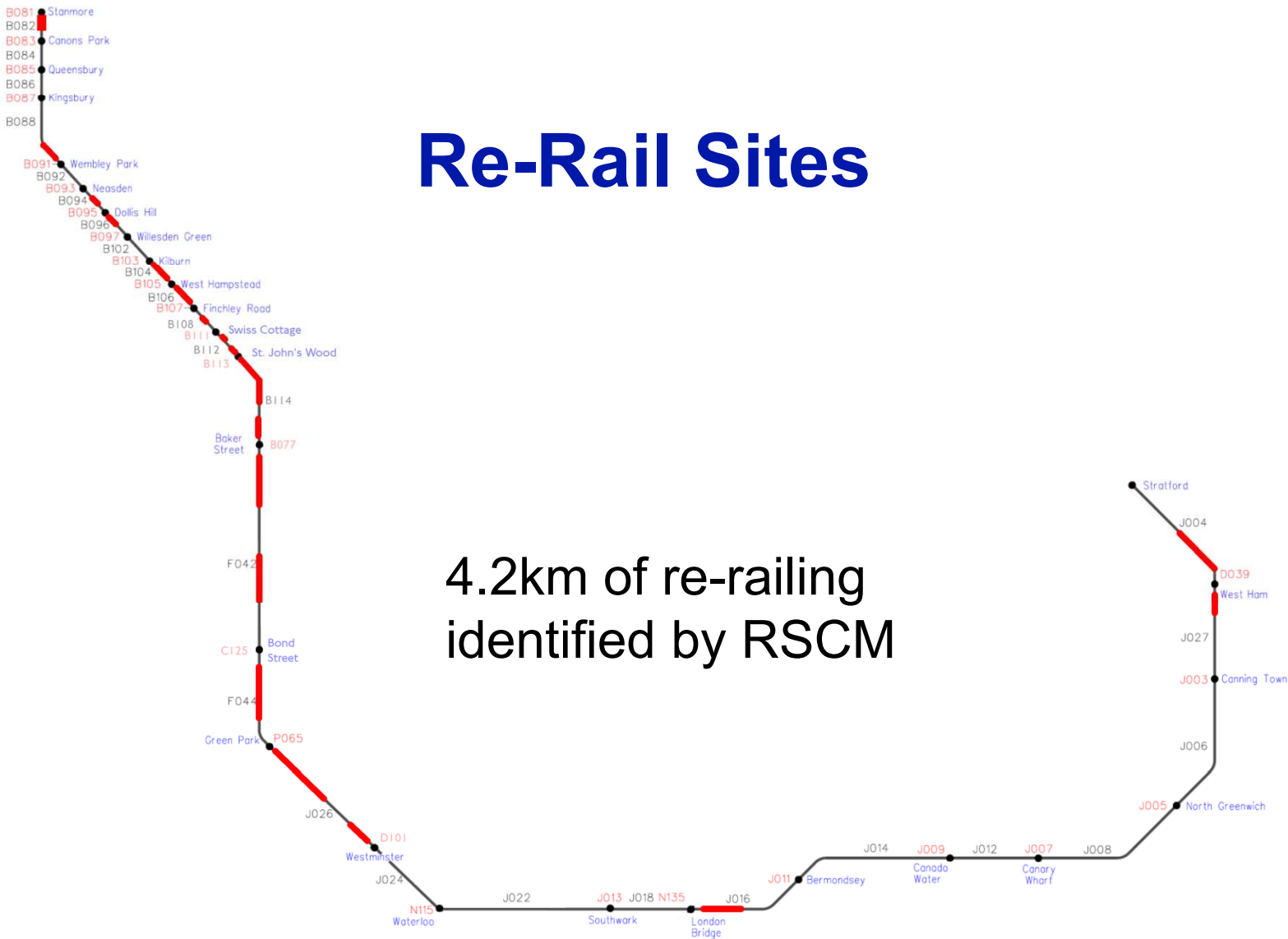


# Network Rail Damage Model



# Re-Rail Sites

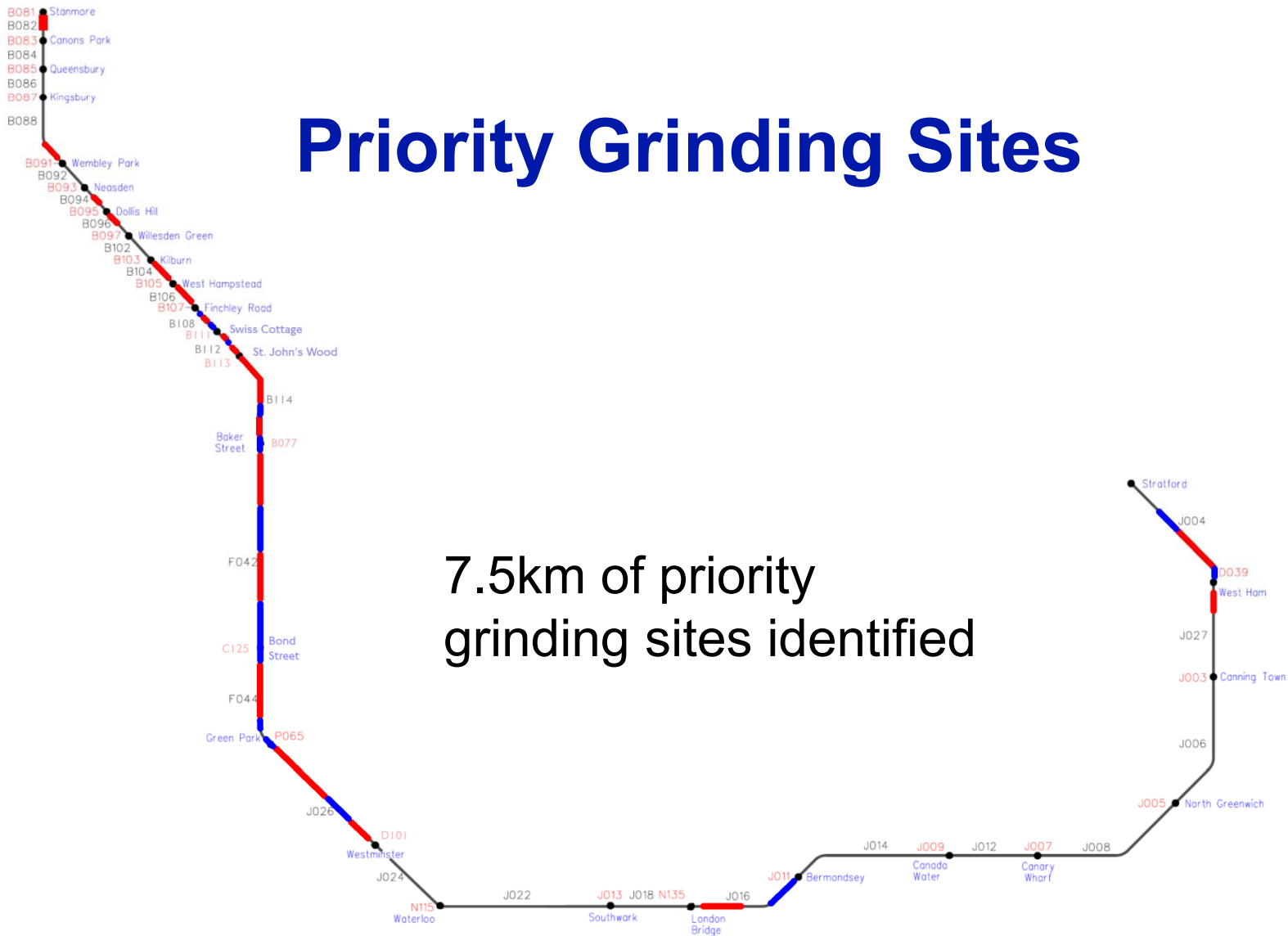
4.2km of re-railing  
identified by RSCM



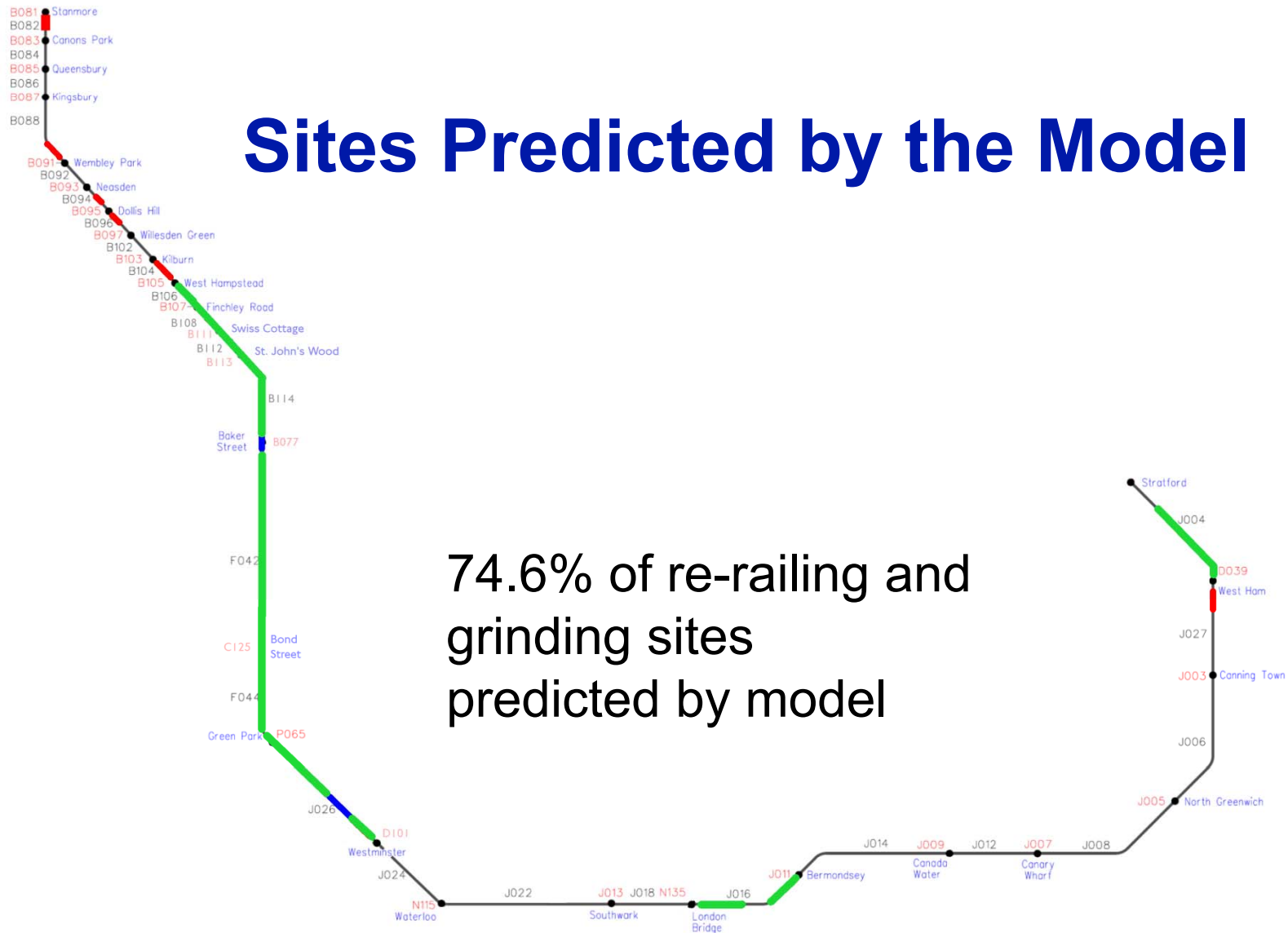


# Priority Grinding Sites

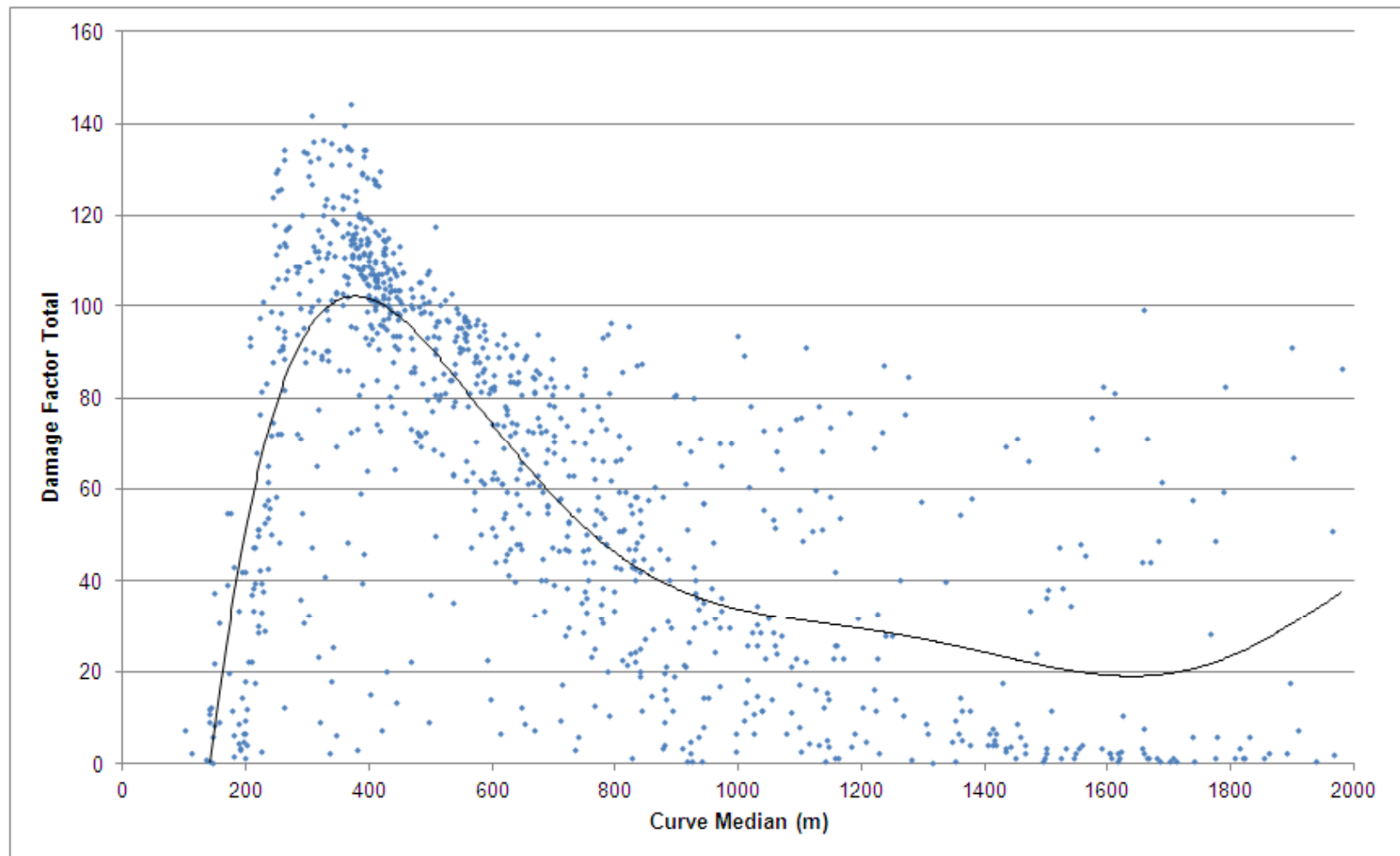
7.5km of priority grinding sites identified



# Sites Predicted by the Model



# Results





# Rail Re-Profiling Limitations

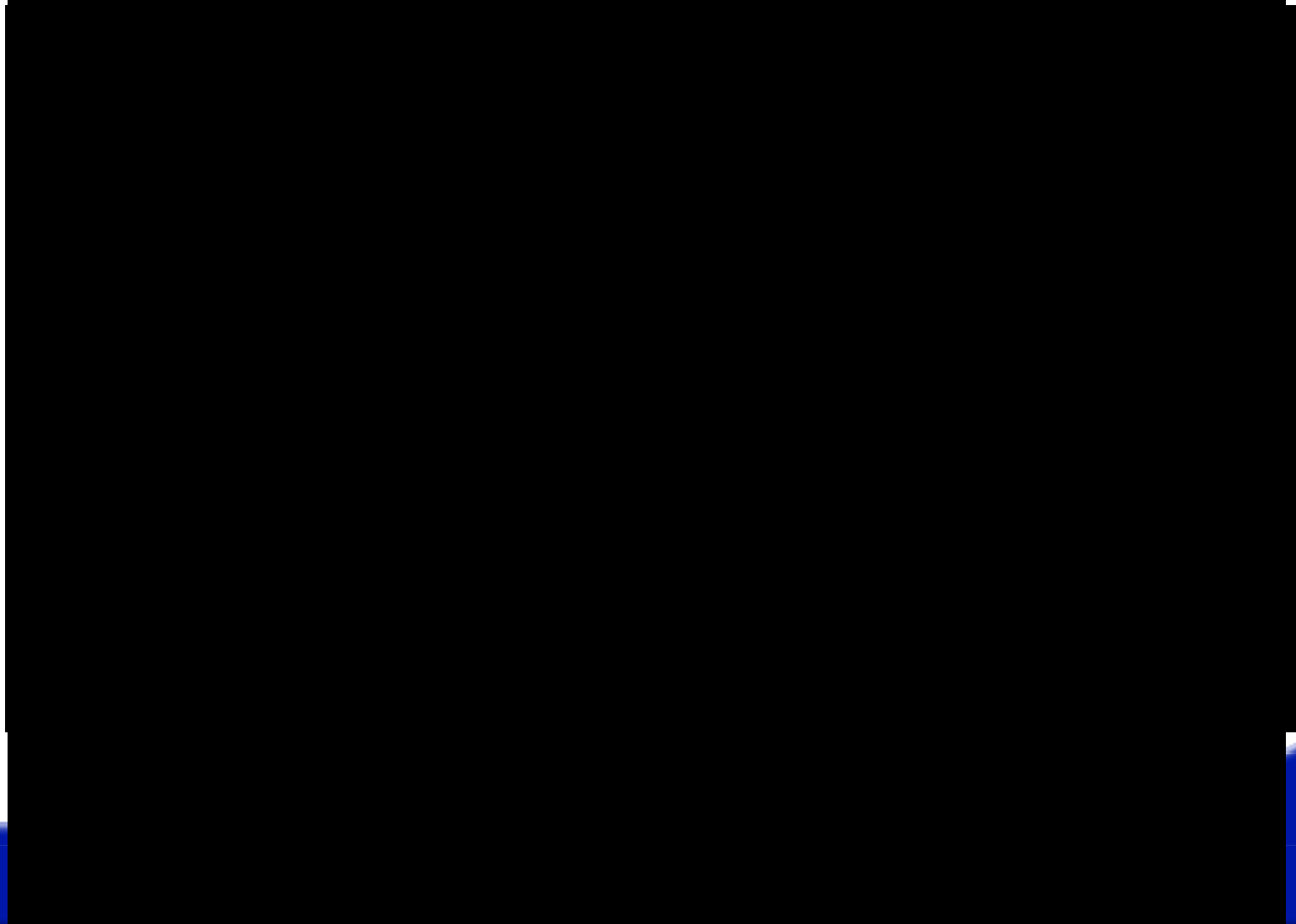


# Predict & Prevent

- **Business Change Programme**
- **All assets and operations**
- **Aims to establish how we use asset data to effectively predict failures**
- **Reduce Lost Customer Hours through reliability improvements**
- **Reduction in whole life cost**

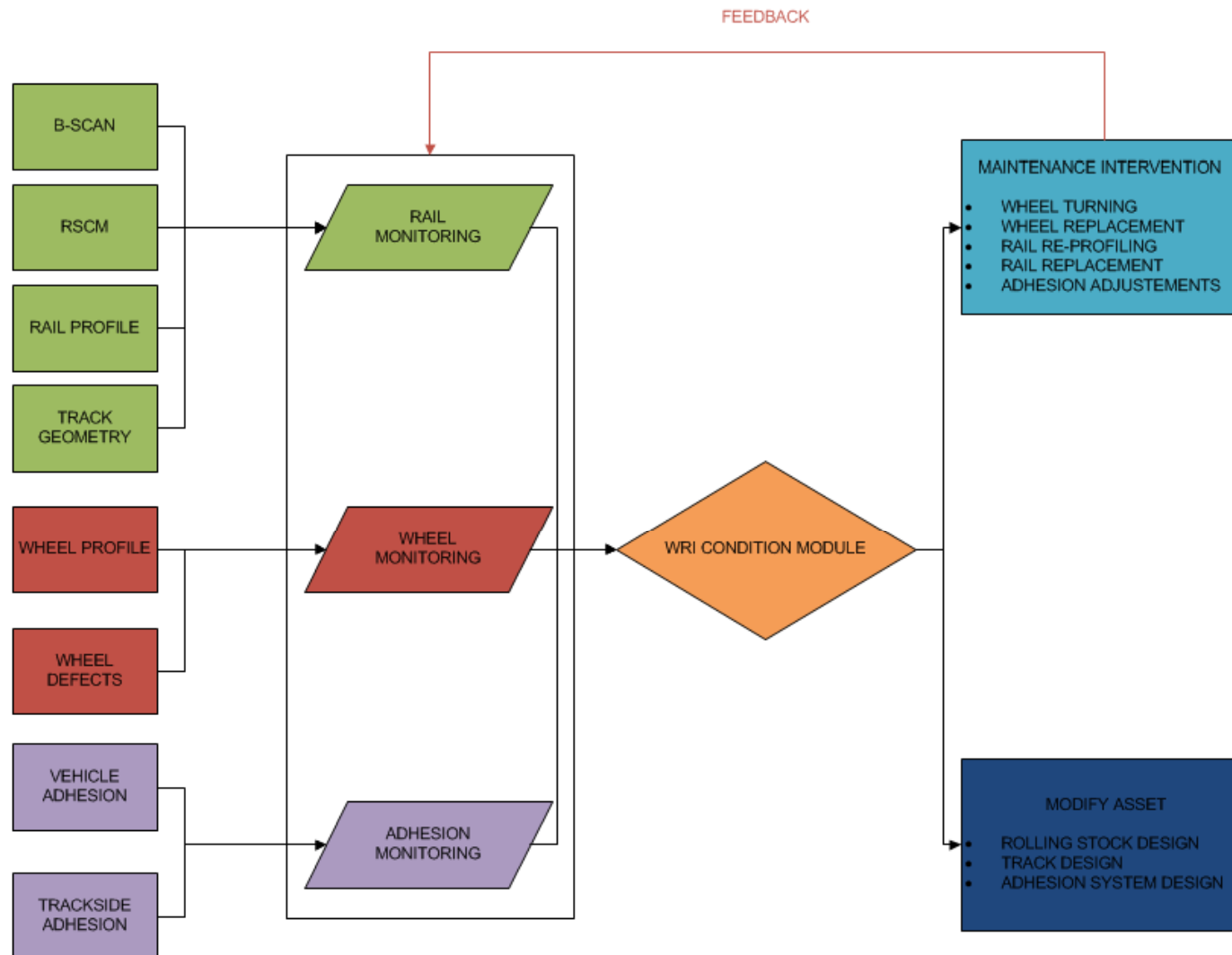


# Predict & Prevent Video





# WRI Strategy



## Further Work

- Identification of Wheel Turning interval for every fleet
- Rail re-profiling frequency to control RCF, wear and corrugation for each track section
- Improvement in rail re-profiling capability
- Rationalisation of adhesion management
- Cultural Change





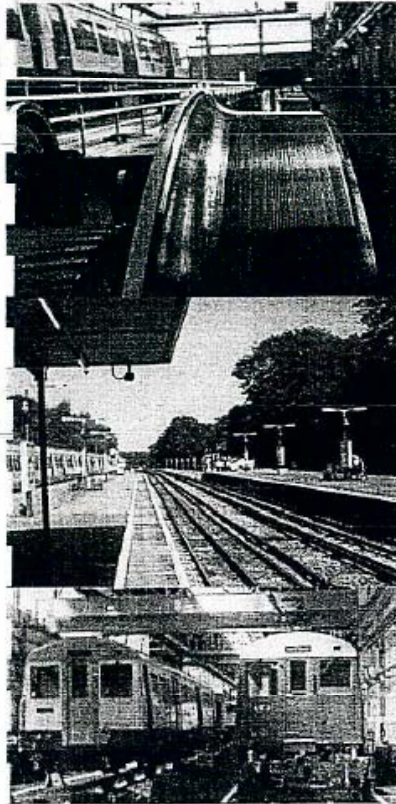
National Research  
Council Canada

Conseil national  
de recherches Canada

**NRC · CNRC**

Centre for Surface  
Transportation Technology

Centre de technologie  
des transports de surface



## Opportunities for Optimising Wheel and Rail Performance on Metronet's Subsurface Lines

A Report to  
Metronet Rail SSL Limited  
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Canada

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June 2003

