

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



**London
Underground**

22nd October 2015

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- **Formation of WRI Team**
- **Inter Stock Running**
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- **Predict & Prevent**
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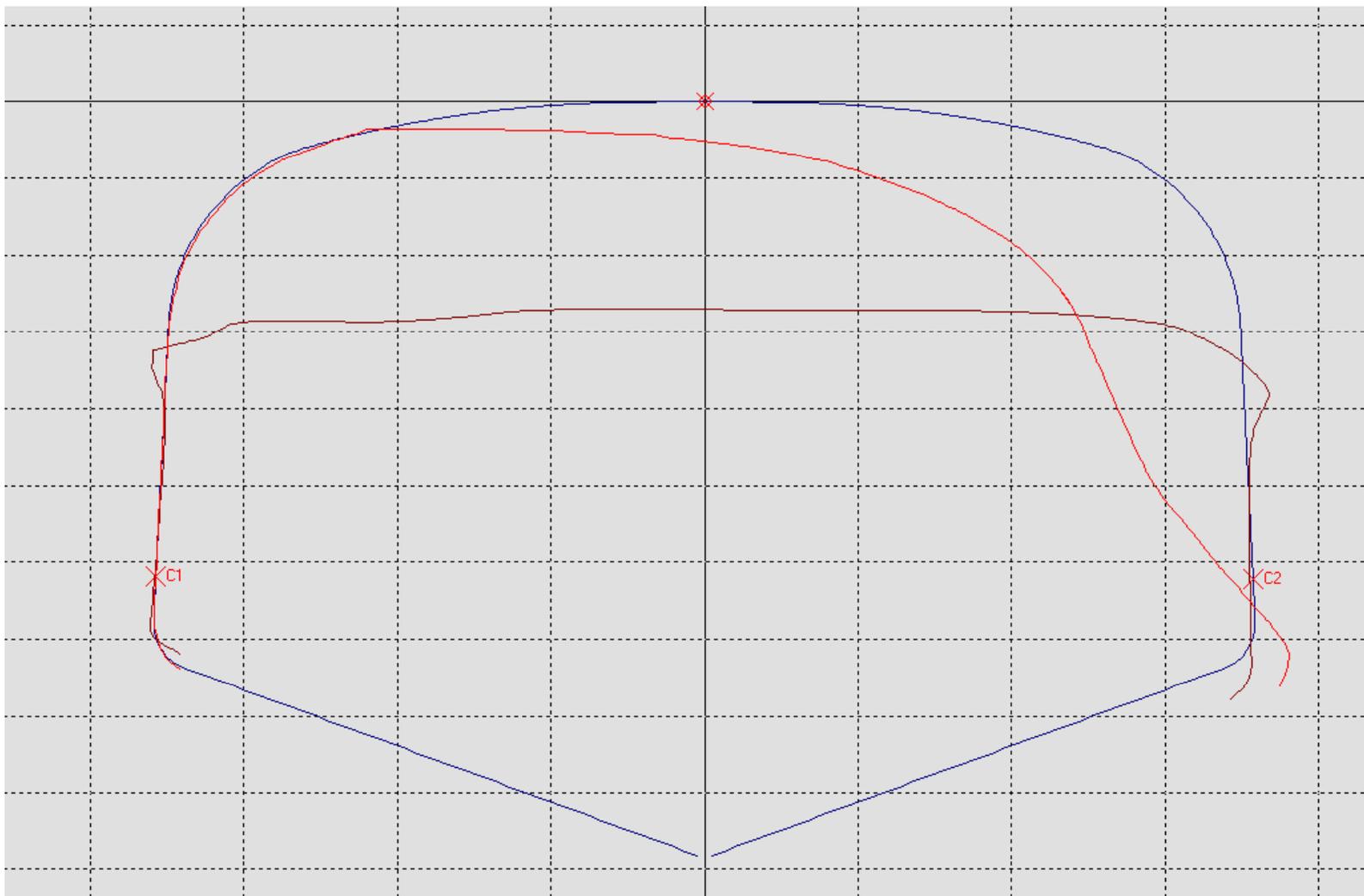
Westminster



Rail Wear



Rail Wear



Friction Measurements



Inter Stock Running



Track Based Lubricators



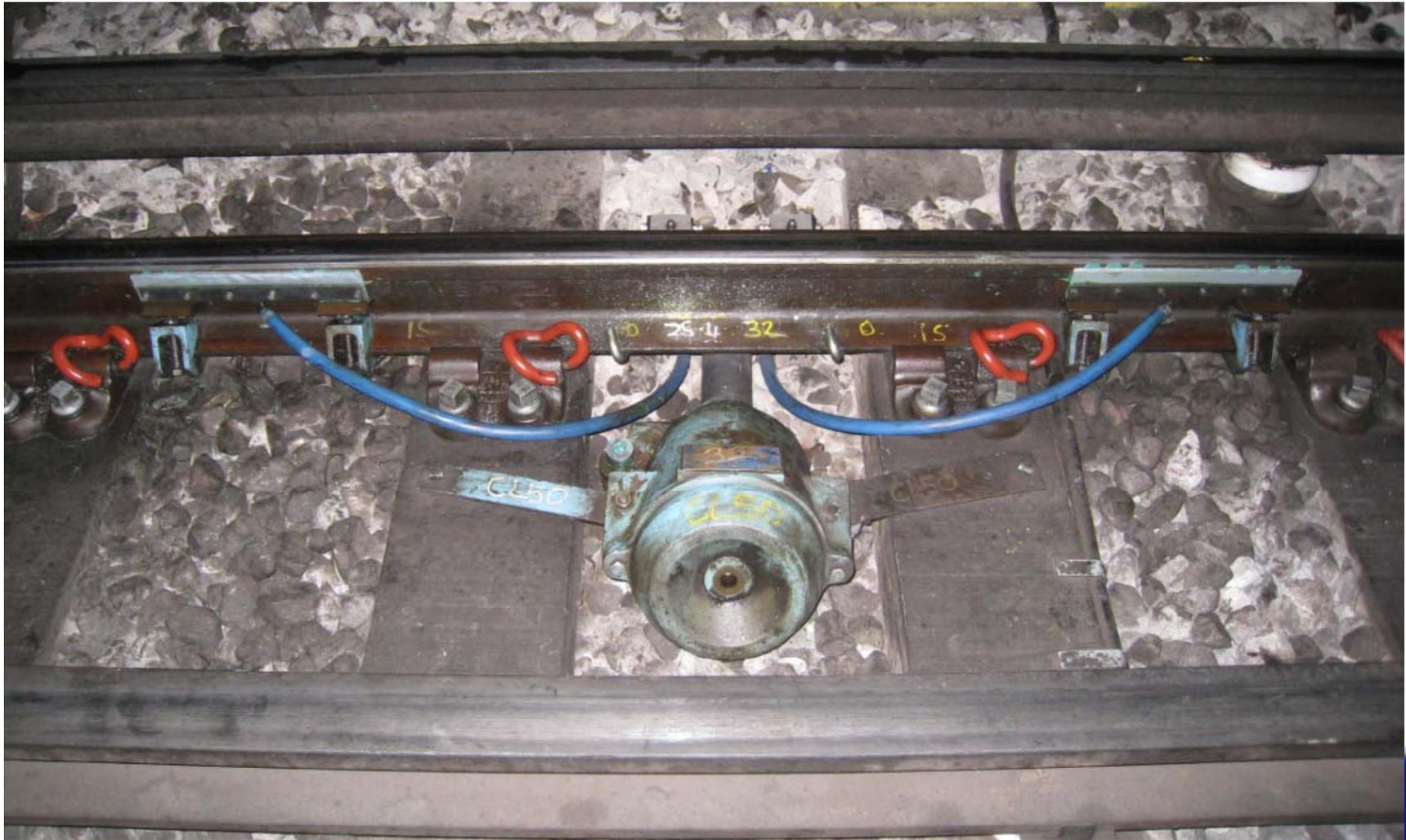
C-Stock Underframe



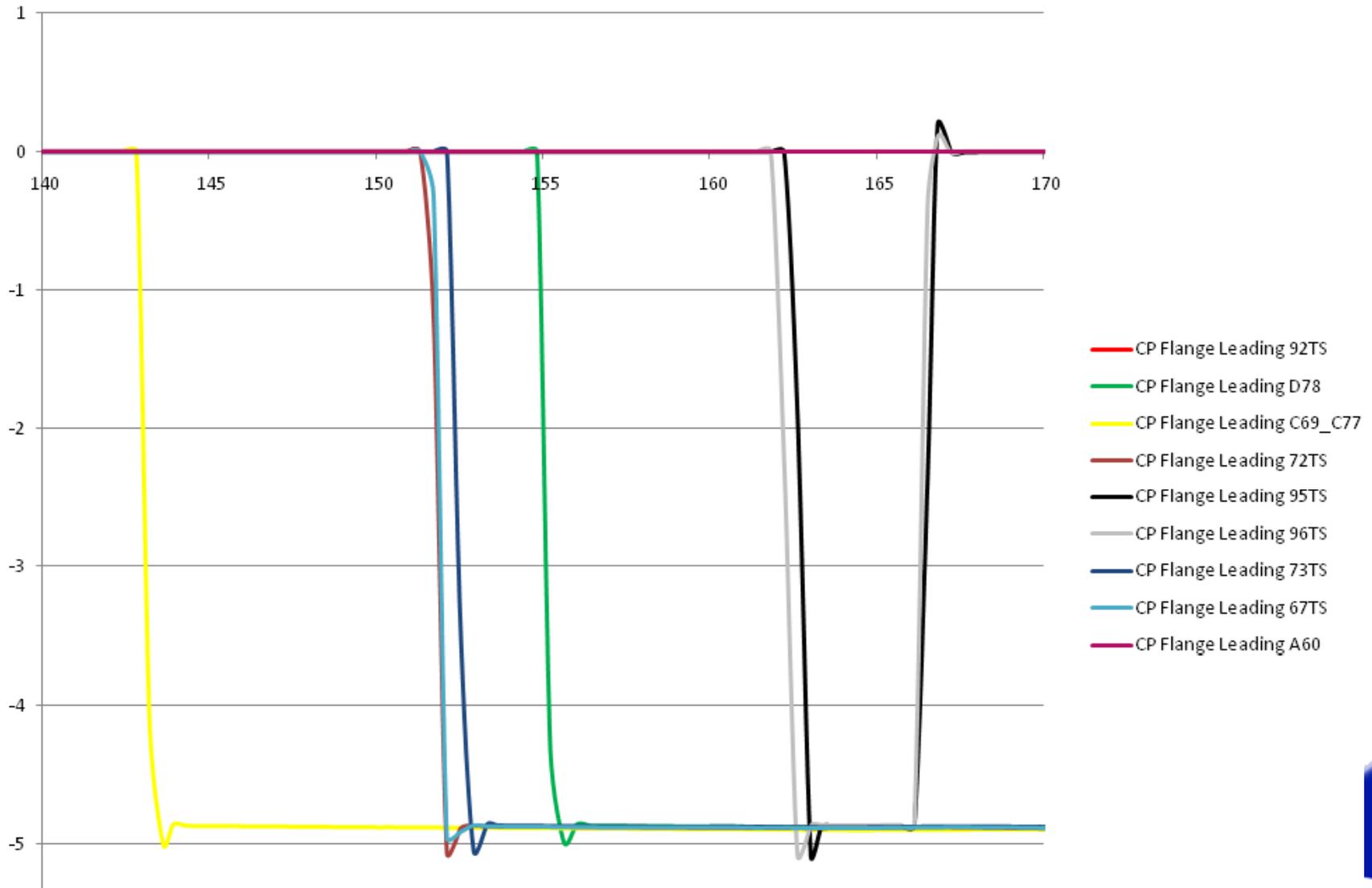
Wheel Flats/Cavities

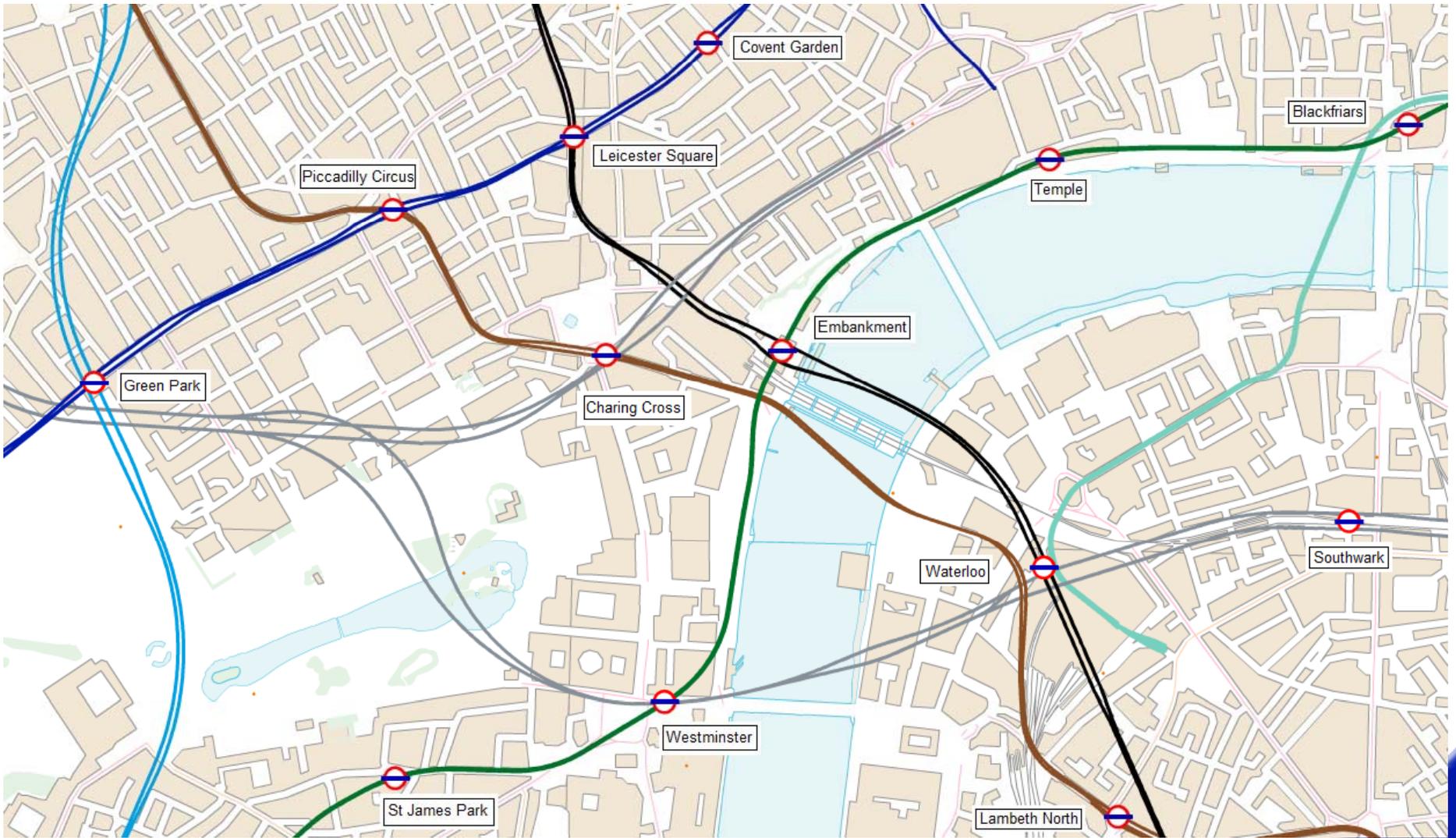


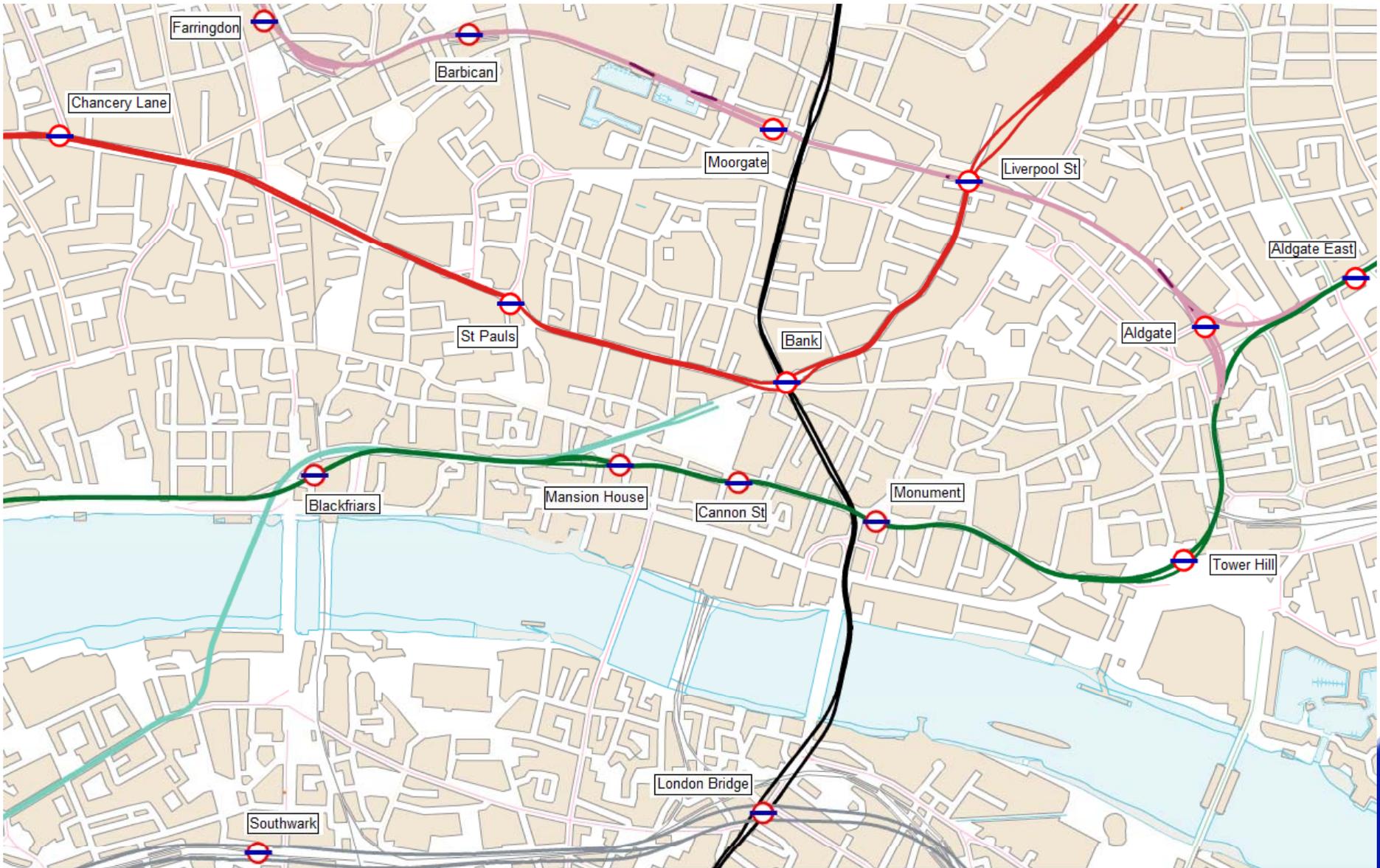
Green Grease Trial



Curving Performance



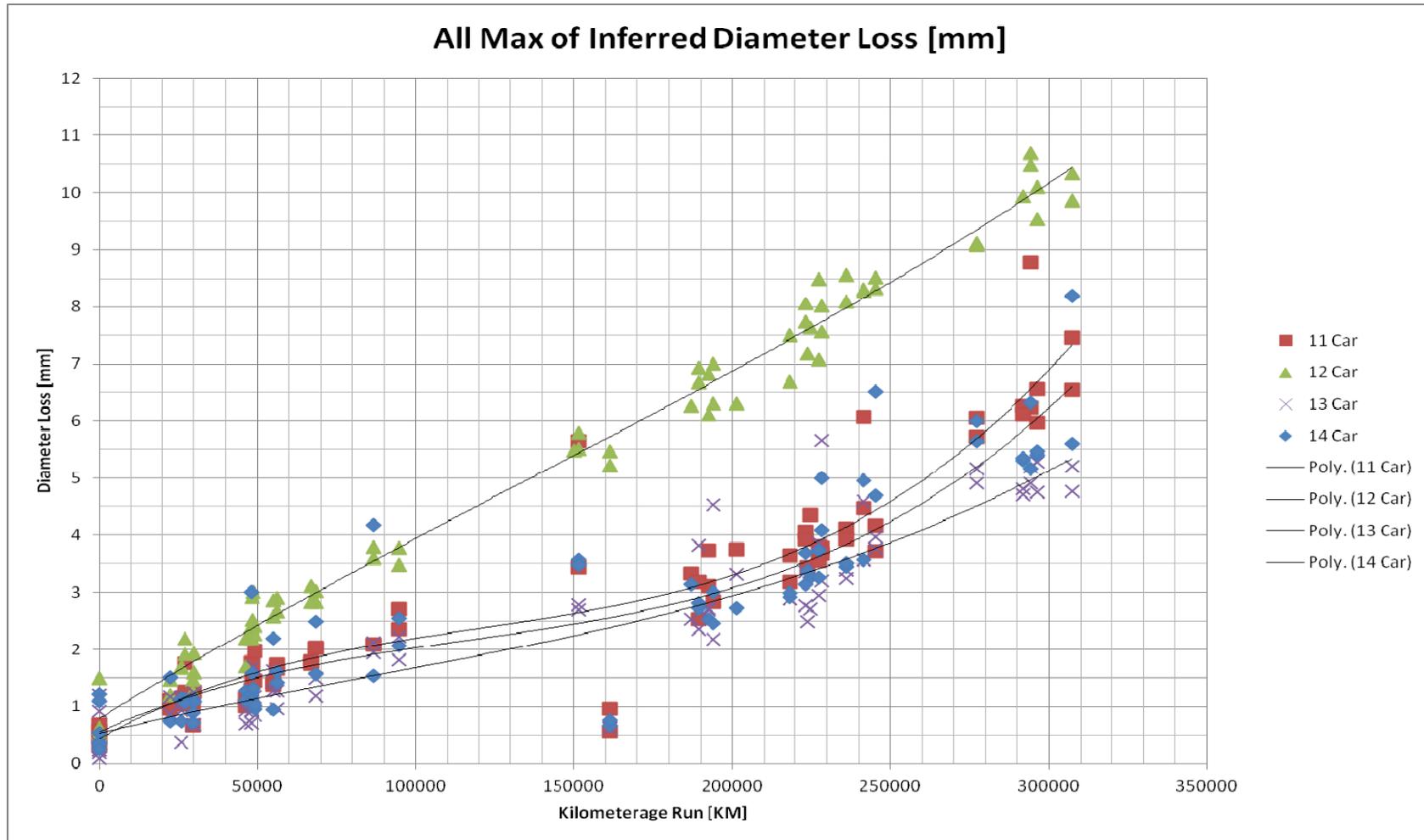




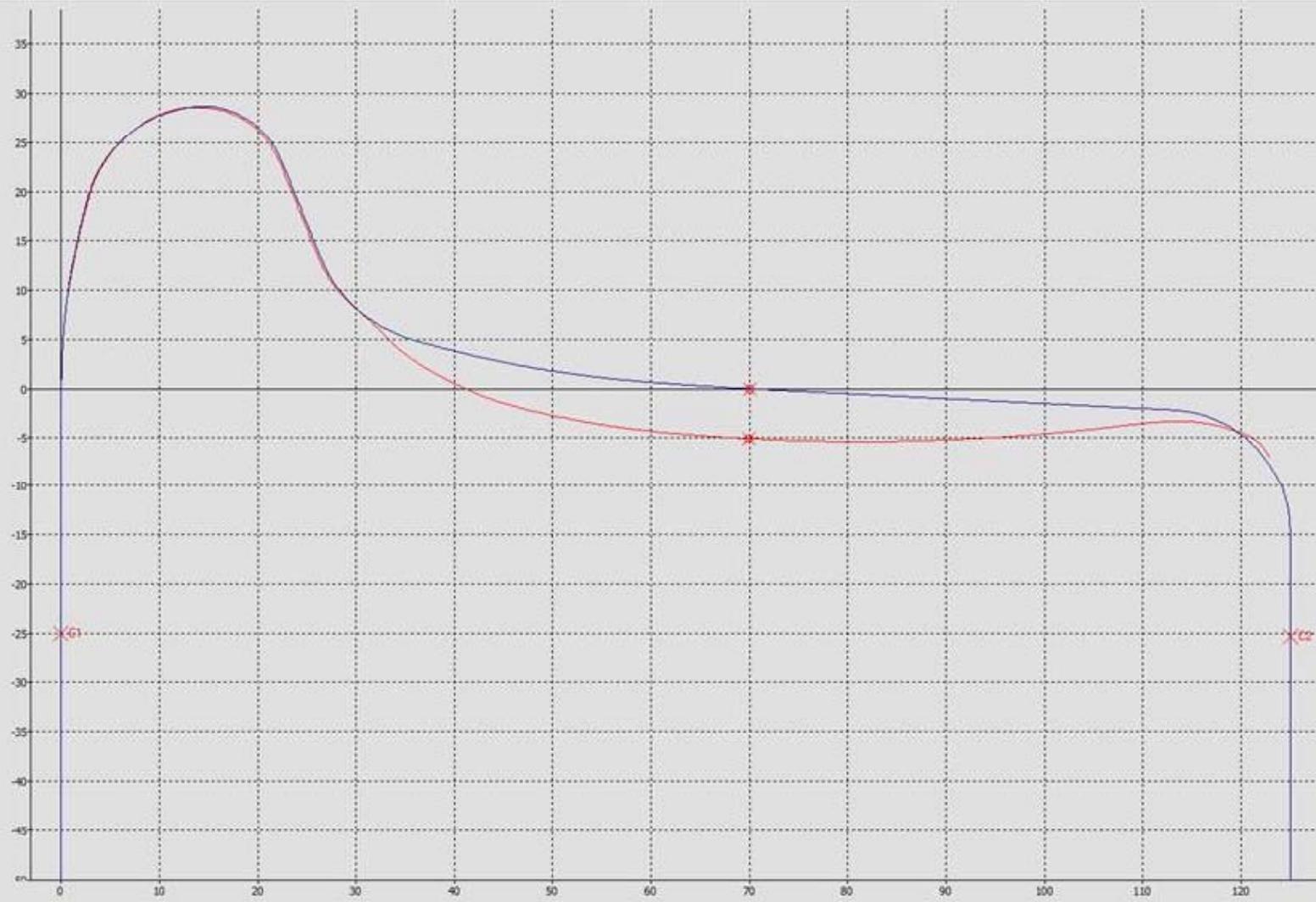
09 Tube Stock



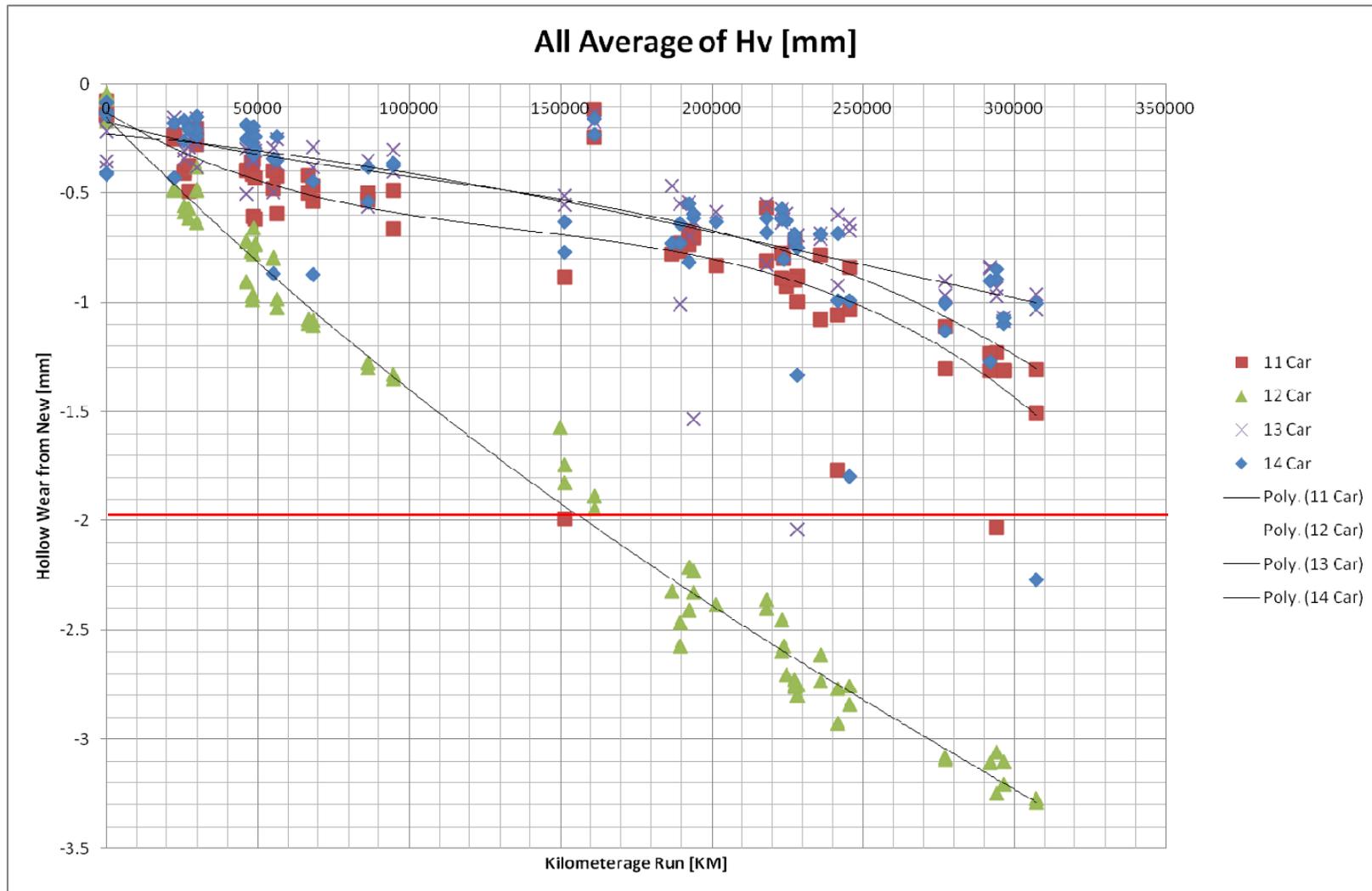
09TS Wheel Profile Results



Hollow Tread



09TS Wheel Profile Results

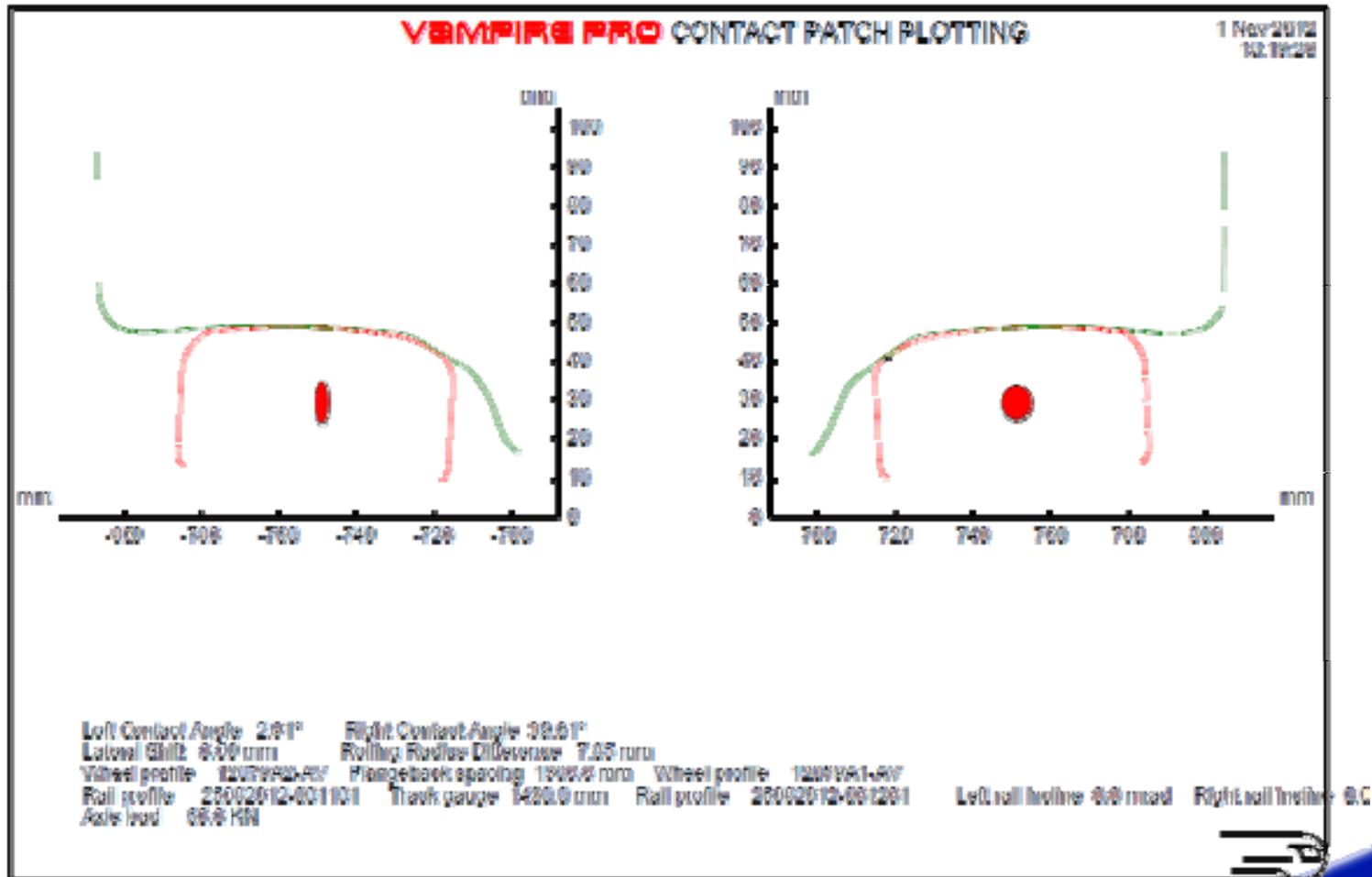


Condition Turn Status

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 th 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 th 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 nd 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.



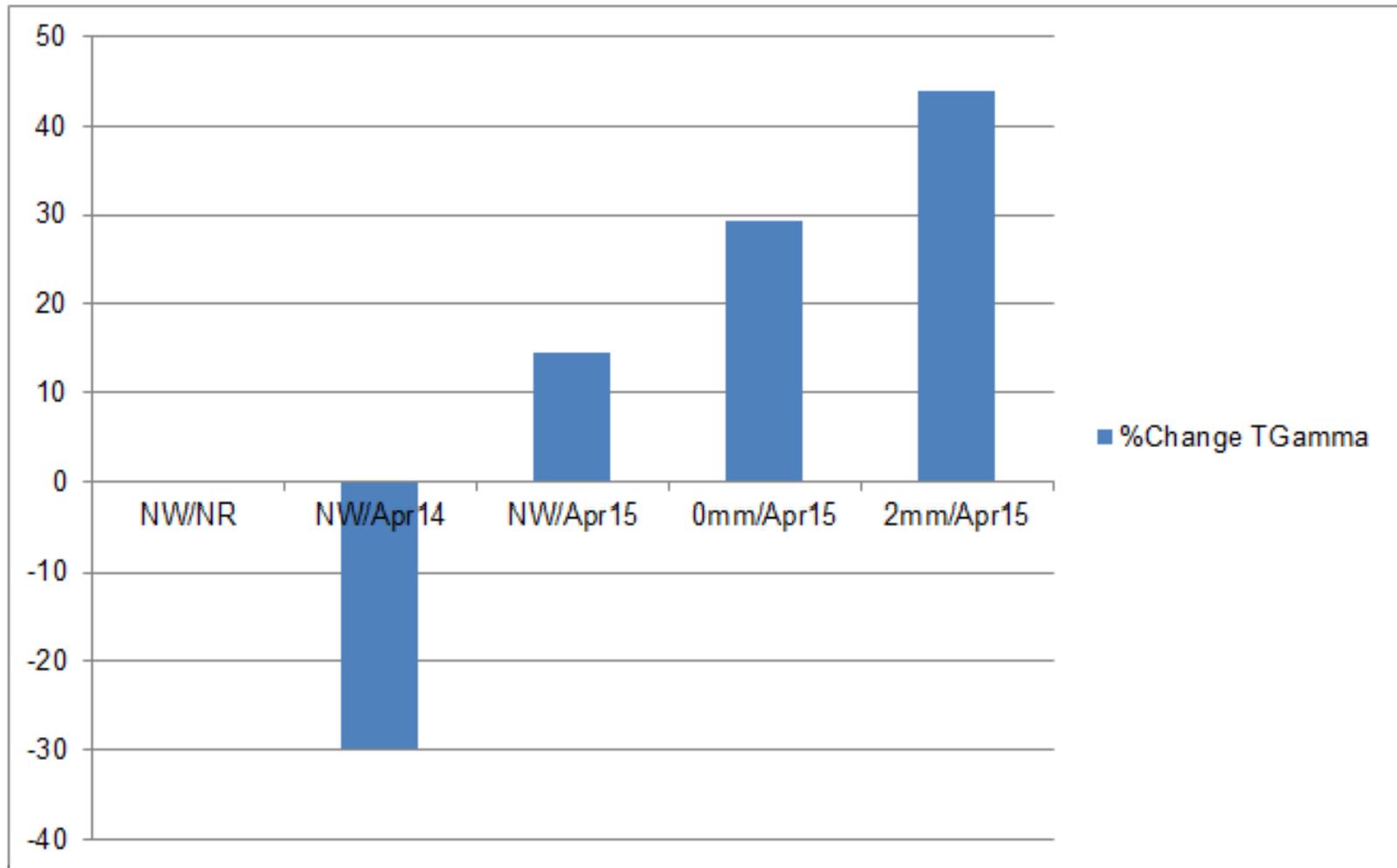
Vampire Analysis



VAMPIRE Plot



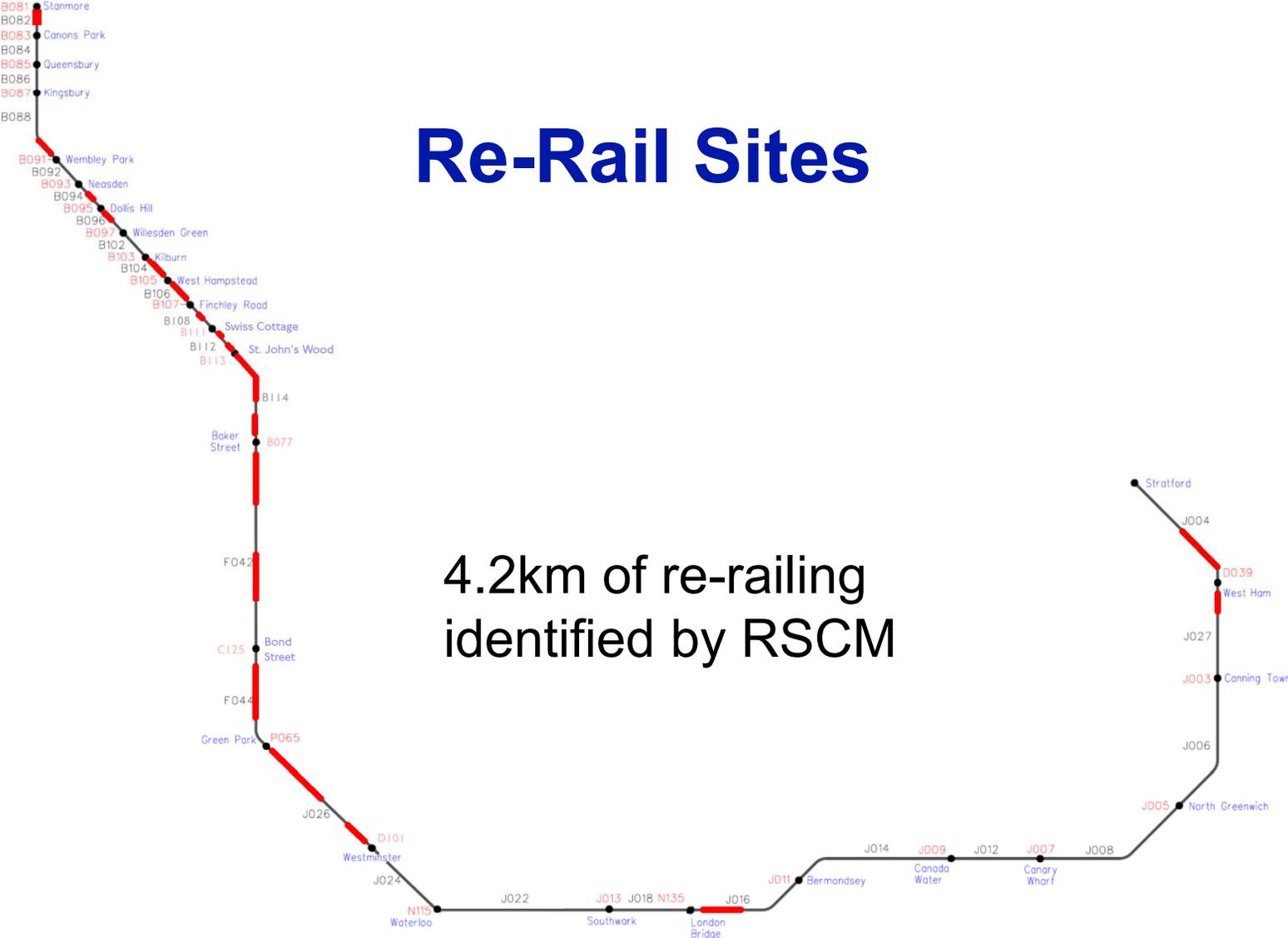
Damage Change



Network Rail Damage Model



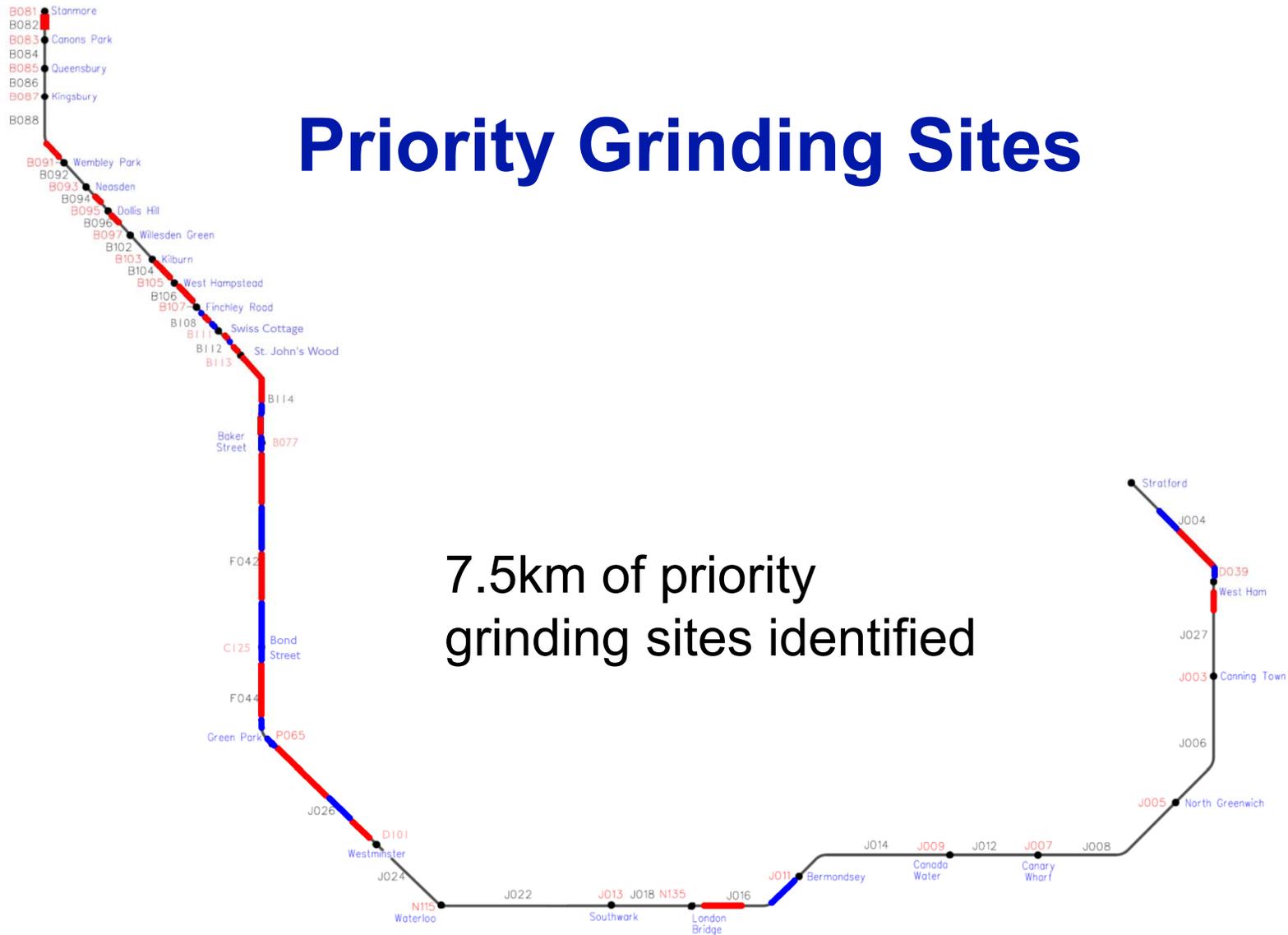
Re-Rail Sites



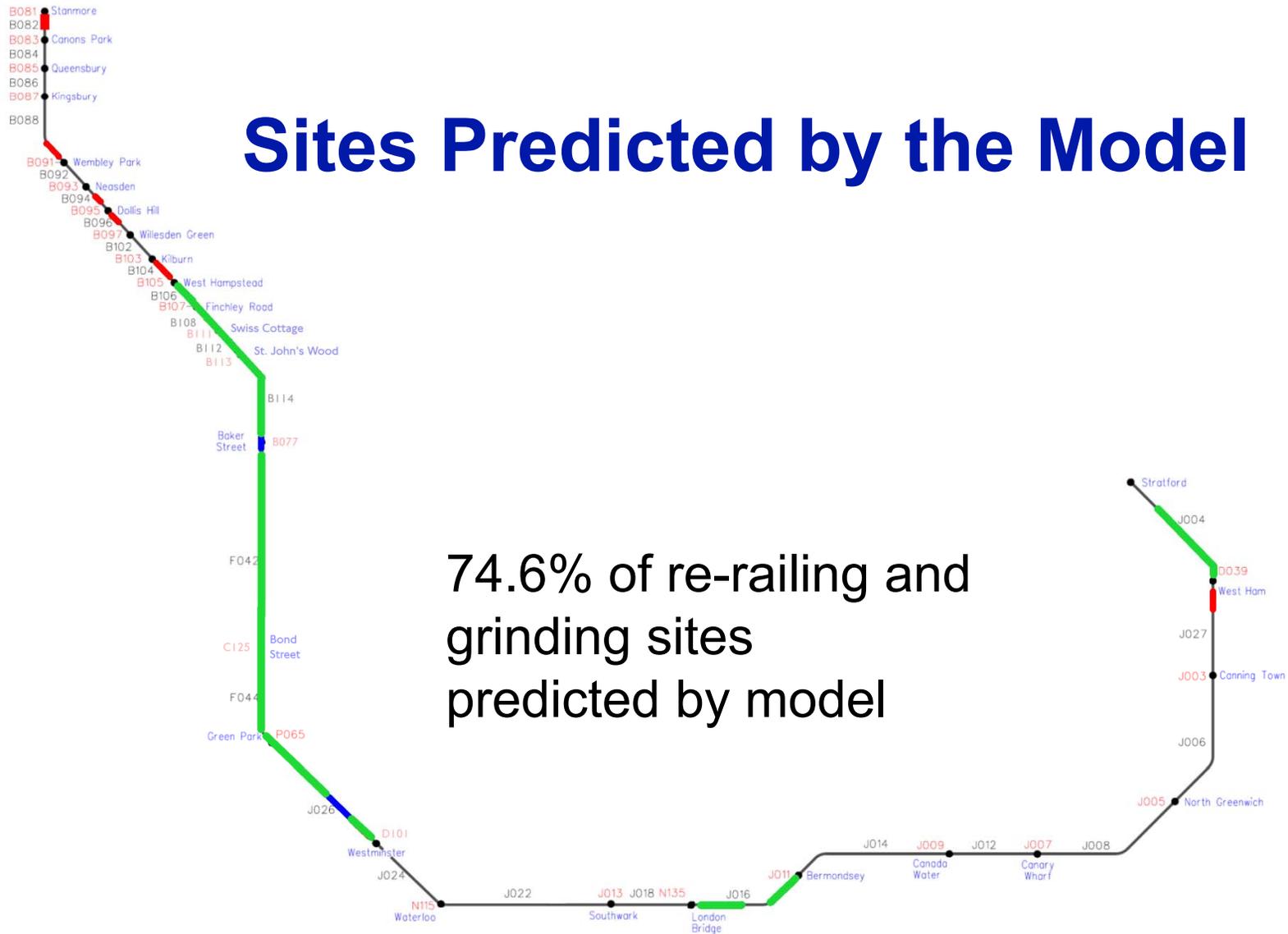
4.2km of re-railing identified by RSCM



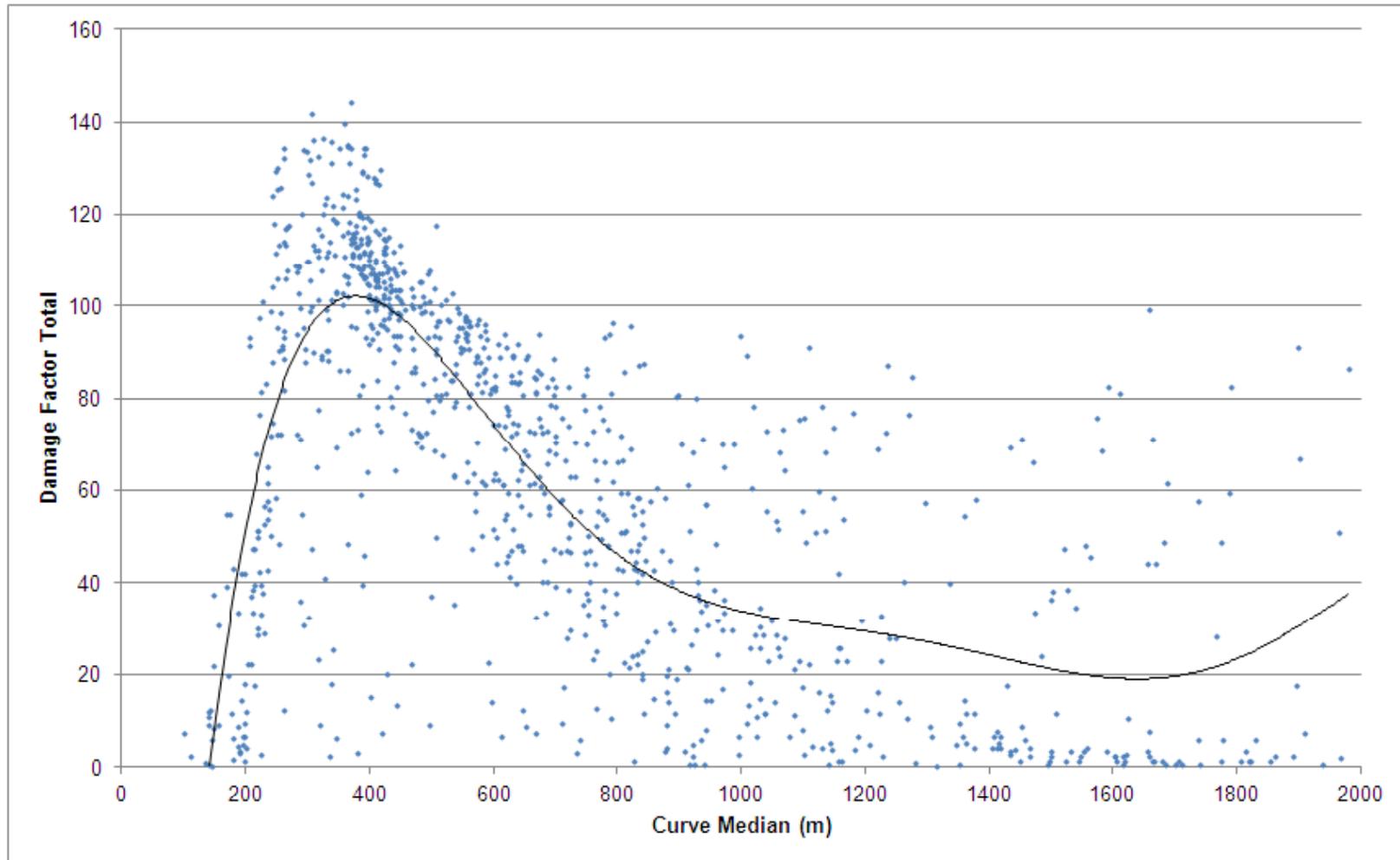
Priority Grinding Sites



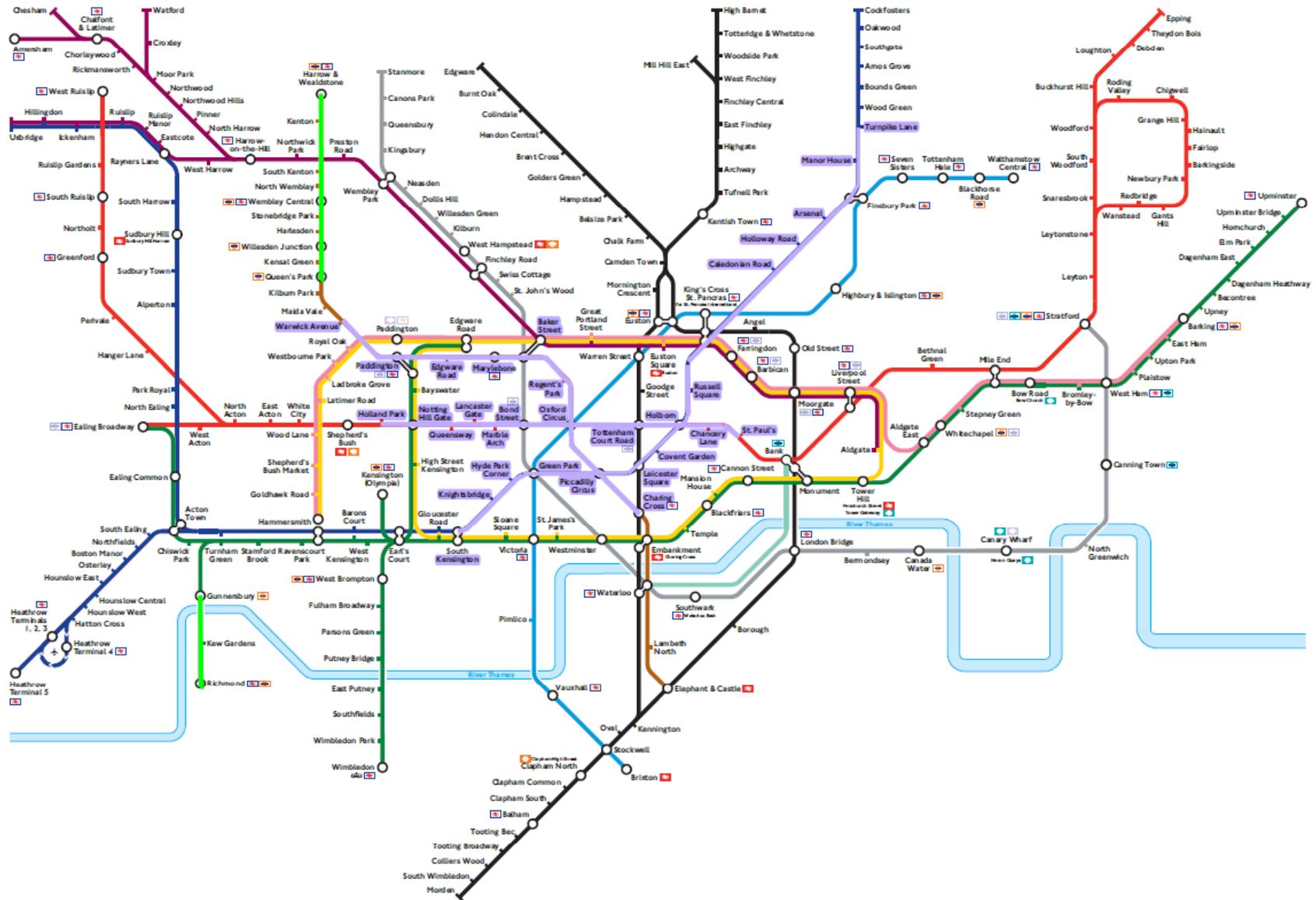
Sites Predicted by the Model



Results



Rail Re-Profiling Limitations

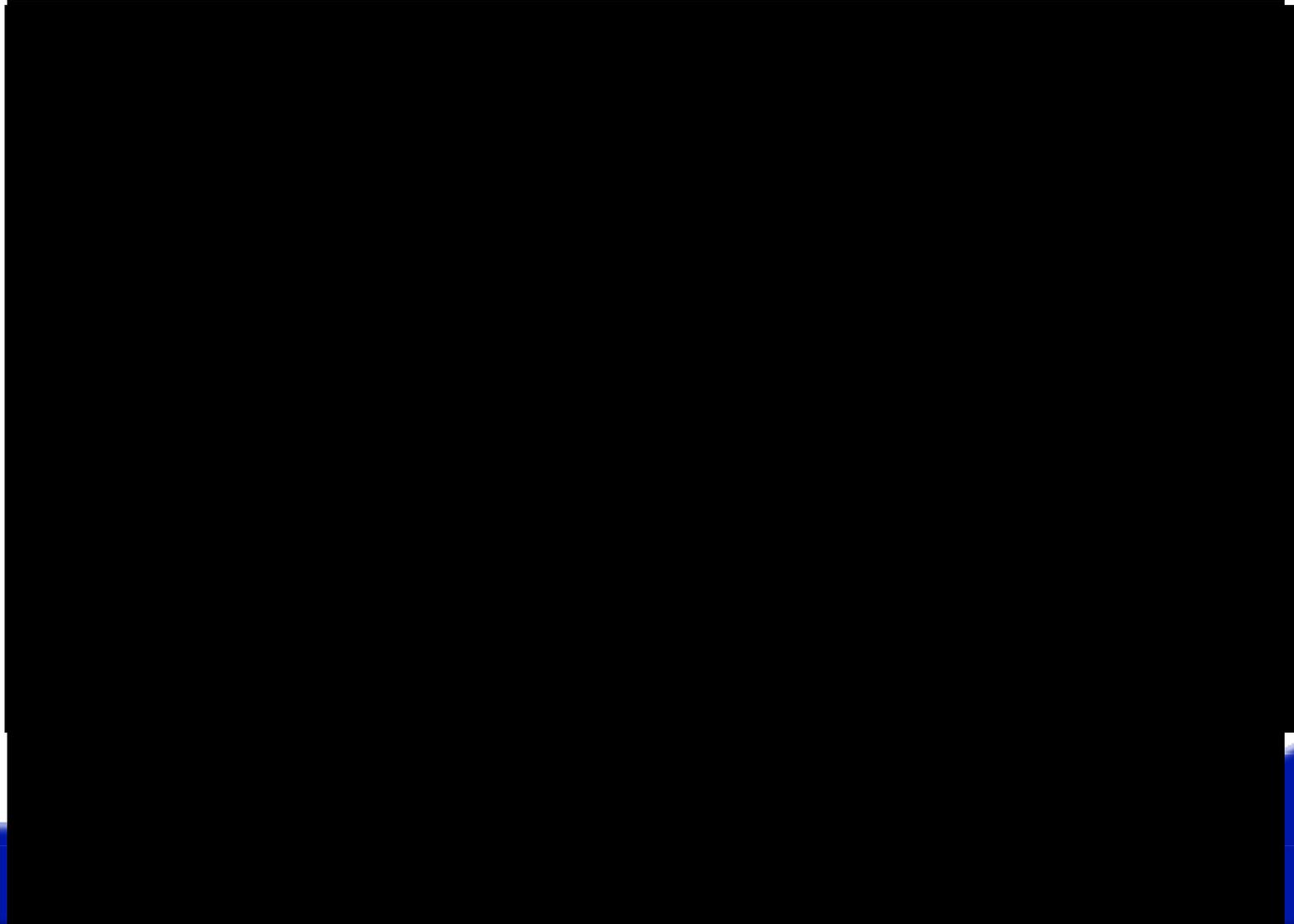


Predict & Prevent

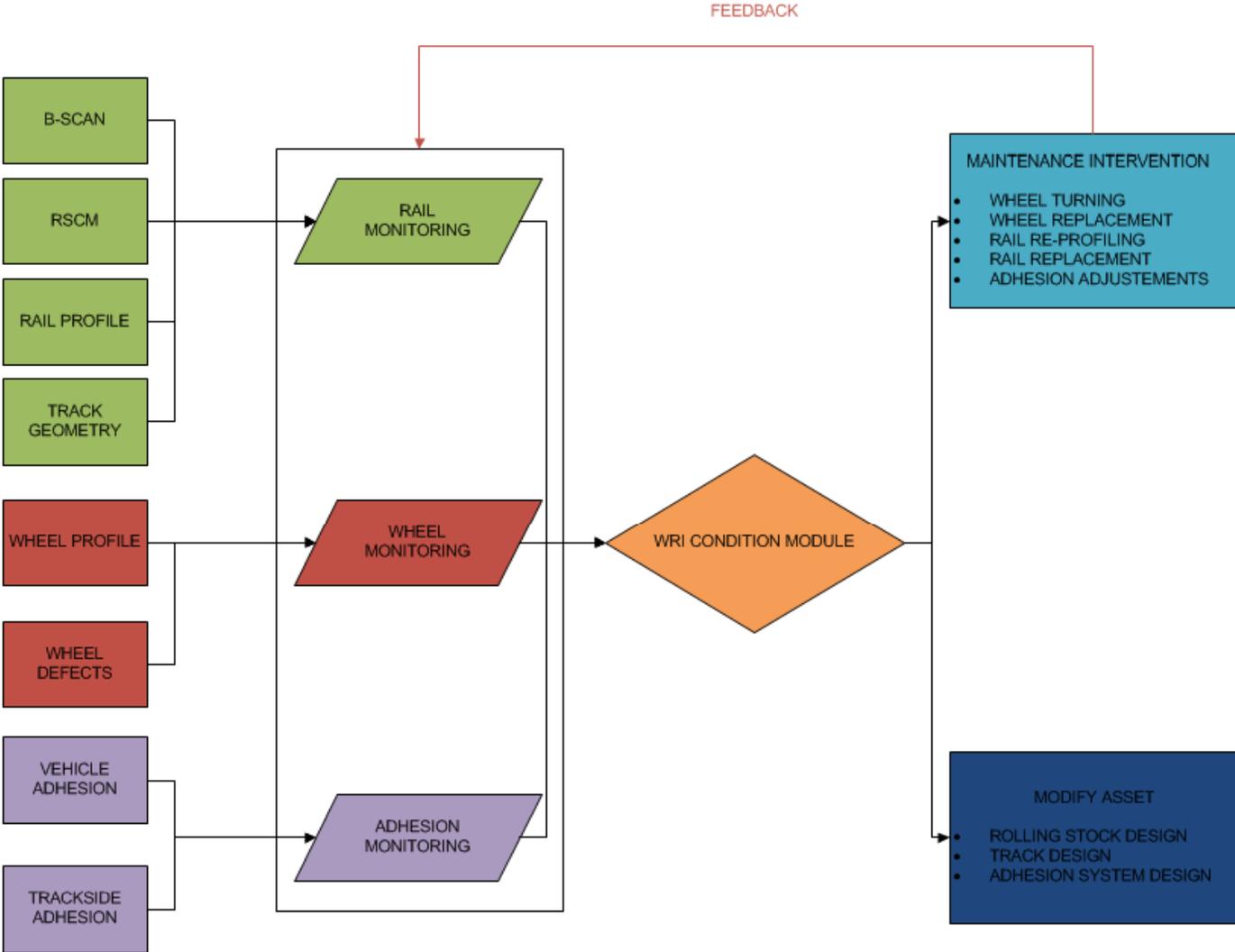
- **Business Change Programme**
- **All assets and operations**
- **Aims to establish how we use asset data to effectively predict failures**
- **Reduce Lost Customer Hours through reliability improvements**
- **Reduction in whole life cost**



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**





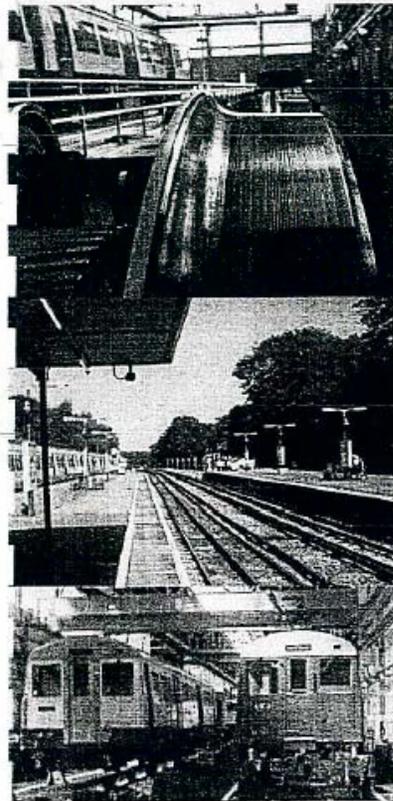
National Research
Council Canada

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
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June 2003

