

A Train Operators Experience of Wheel Life Improvement

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Contents

Context

Why extend wheel lives ?

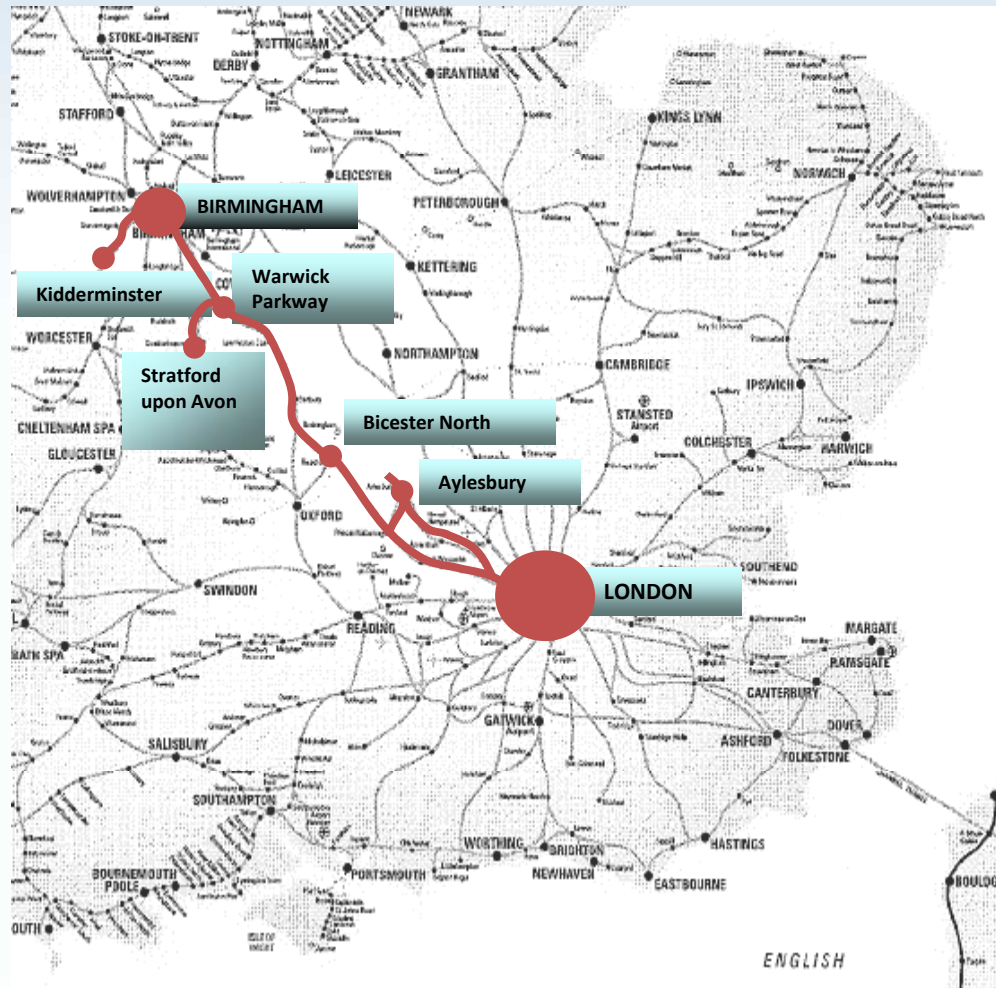
What do we need to consider ?

UK Wheelset maintenance best practice

Results so far....

Where next ?

Chiltern Railways



- Chiltern Railways franchised in 1996
 - business plan based on growth
- Replacement franchise let in 2002
 - investment-led business
 - runs until 2021
 - only main-line railway with a long-term franchise
- Uses Network Rail and LU infrastructure

Fleet



Class 165/0

39 units of 2 and 3 car formation.

Total 89 vehicles

Built 1991-1992, refurbished 2002-2004

Mainly used on commuter journeys less than 1 hour in duration.

100,000 miles / 160,000km per year

Fleet



Class 168/0, /1 & /2

24 units of 2, 3 & 4 car formation.

Total 77 vehicles

Built 1998-2005



Mainly used on longer distance journeys.

190,000 miles / 300,000km per year

Fleet



Class 172

4 units of 24 car formation.

Total 8 vehicles

Built 2011

Mainly used on medium distance journeys.

140,000 miles / 220,000km per year

Fleet



Mk3 Trainset hauled by CI 68 locomotives

5 trainsets 8 car formation.

Total 40 vehicles



Coaches built from 1975 refurbished since 2005.

Locomotives built 2014

Used on longer distance journeys.

140,000 miles / 220,000km per year

Why extend wheelset life ?

Wheelset cost approx £5000 ea – approx value £4 million across the fleet.

Trains are for operating not maintaining.

A long life = a safe wheelset

Wheelset Elements



UK Wheelset Best Practise

- 1. Minimise Tyre Turning.**
- 2. Good data – what types of wheel damage are being found?**
- 3. Utilise condition monitoring – wheel impact monitoring & others**
- 4. Modify the wheel / operating / maintenance conditions**

Current Situation

Fleet	Was	Now	Aspiration	Limiting Factor
165	500,000 miles / 800,000 km	650,000 miles / 1,000,000 km	800,000 miles / 1,300,000 km	Axle Bearing life
168	N/A	1,100,000 miles / 1,700,000 km	1,500,000 miles / 2,400,000 km	Wheelpan diameter

Current Situation

Fleet	Was	Now	Aspiration	
172	N/A	560,000miles / 900,000 km	1,100,000 miles / 1,700,000 km	Wheelpan diameter
Mk3 Trains et	N/A	600,000miles / 1,000,000 km	800,000 miles / 1,300,000 km	Axle Bearing

Condition Monitoring

Current Approach

- Atlas FO – Wheel tread defects
- TADS – Axle Bearing Health
- PadVIEW – Brake Pads & Brake actuators
- All linked by use of AVI

Wheel Tread Monitoring



Axle Bearing



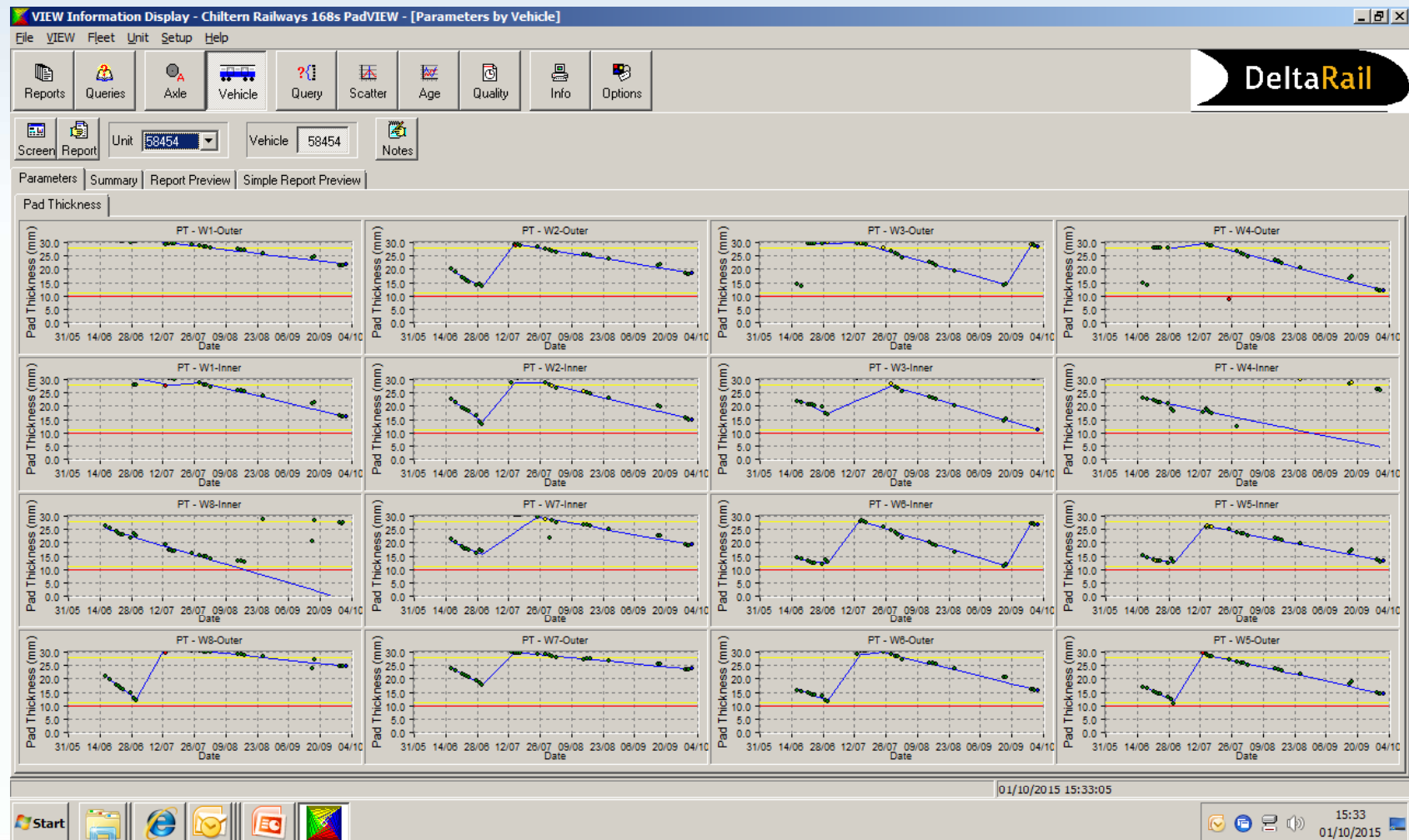
Detected Axle Bearing Defects



PadView



PadView



Where next ?

Class 172

- Alter transmission control logic –disengage engine during braking.

Class 168

- P12 Wheel Profile Trial

All Fleets

- Vehicle Underframe Examination System
- Sander development
- Wheel Scrap Size reduction

Any questions ?