We can use Geospatial Technology to Calculate Railway Infrastructure Utilisation

Analyzing railway infrastructure utilisation: A geospatial approach
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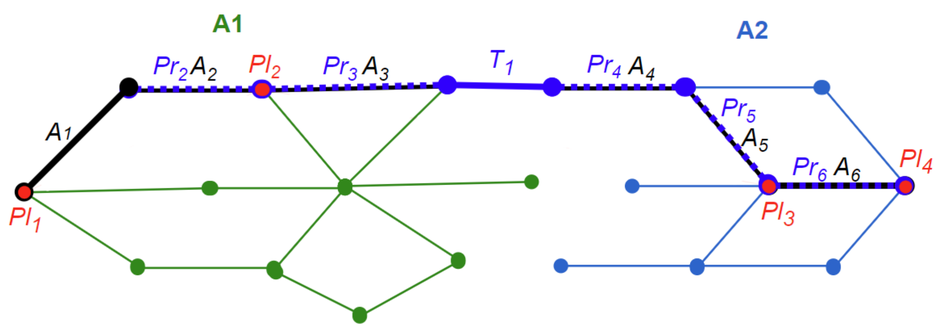
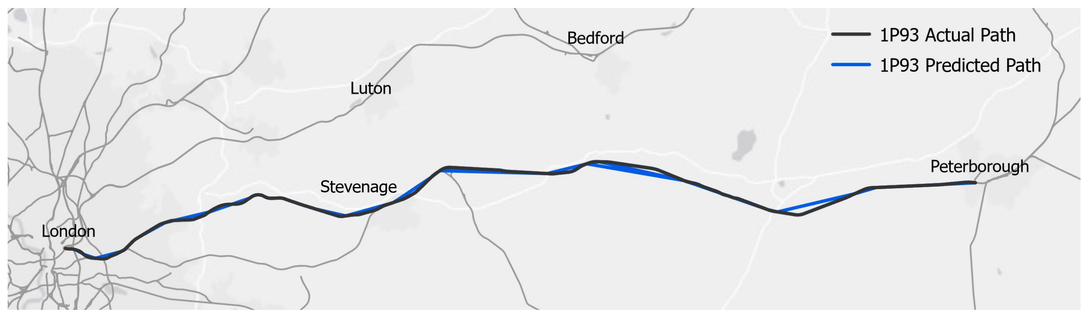
Background: Understanding railway infrastructure utilisation can identify areas for improvement in planning and realtime railway operations. Currently there is no metric tracking utilisation in the UK Railway.

Methodology

1 Determine route (***Pl$_n$***) through the infrastructure network of **planned (*Pr$_n$*)** and **actual(*A$_n$*)** edges



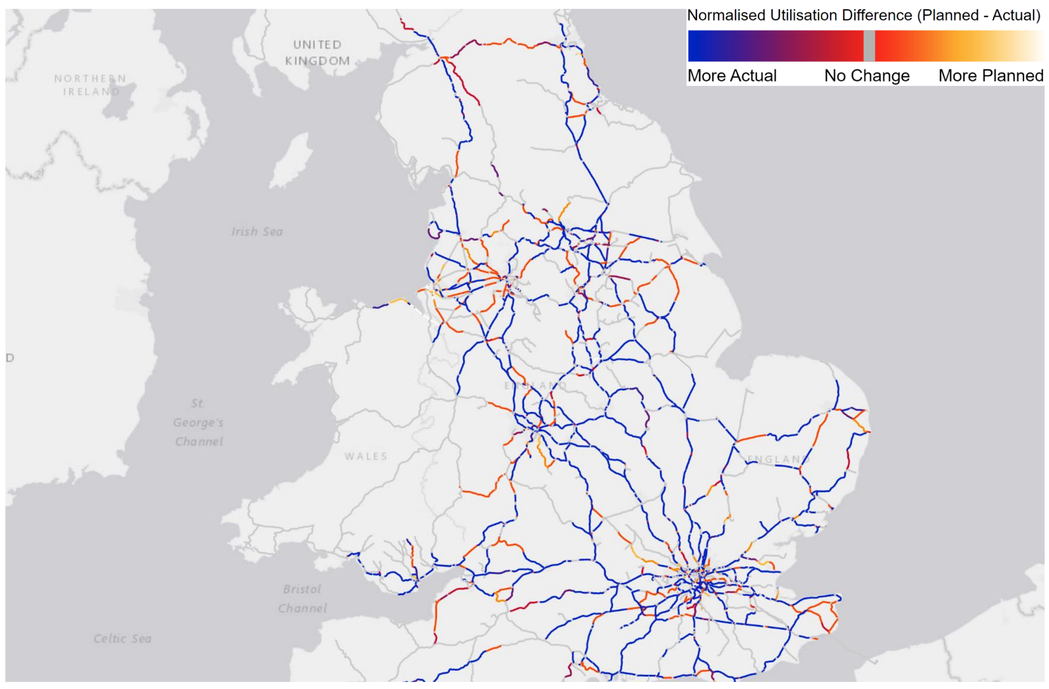
2 Determine geospatial path of each train and calculate infrastructure utilisation (count of occupation)



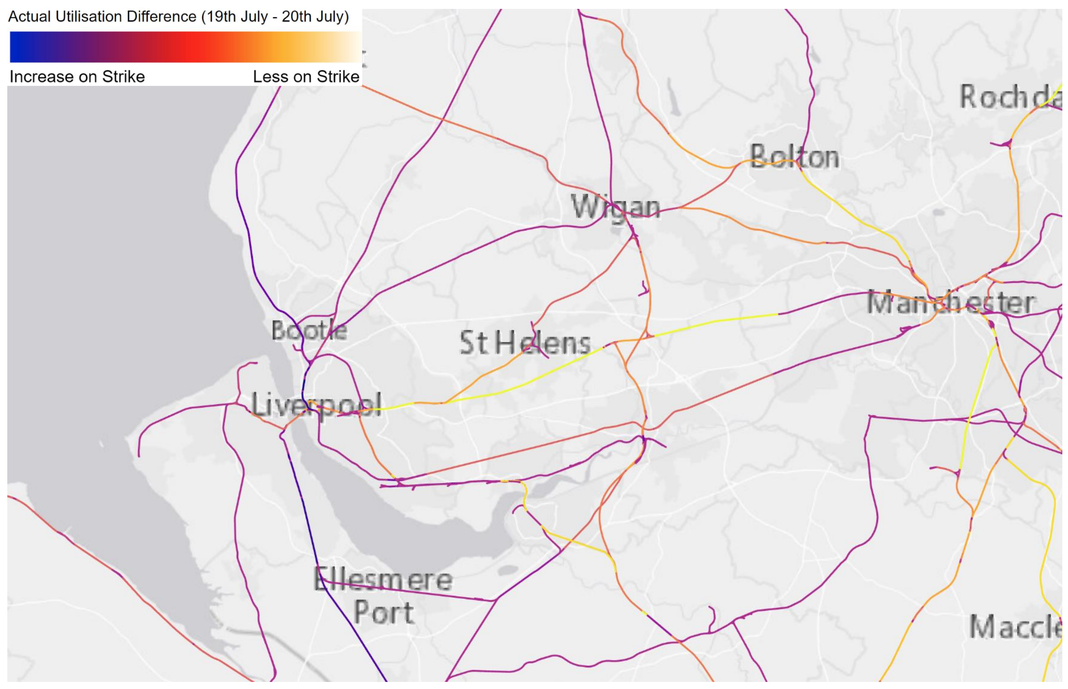
Limitations: Data quality and availability effect the quality of the calculated geospatial path and utilisation outputs. Lack of infrastructure metadata effects the utilisation and capacity calculation method used.

Results

Planned vs Actual Utilisation (11th - 3rd July)



Strike Day Impact (19th vs 20th July)



Conclusions: It was possible to calculate utilisation with geospatial techniques though with ambiguous results due to data quality. Analysis of the strike action utilisation showed the method has potential considering data quality

Next Steps: Improve quality of input data & methods of validating outputs. Use additional infrastructure data to apply & compare other methods for determining utilisation. Investigate alternative uses of prediction models and utilisation outputs in realtime to detect issues and improve utilisation & performance

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