Overview

• Background

• Possession compensation system in Britain

• Compensation formulae and calculations
  – Automating the calculations

• Increasing Network Availability
  – Industry Access Programme
  – Alternative approaches

• Summary and Conclusions
Background

• Access pressures
  – Increasing levels of passenger and freight traffic
  – Increased ‘wear and tear’, need for M&R
  – Pressure to reduce durations of M&R possessions

• Possession compensation payments a significant element of RU revenue
  – Desire to check IM calculations and payments
  – Forecast likely future payments
Possessions Compensation System in GB

• Set out in Schedule 4 of Track Access Contracts, hence Schedule 4 Compensation System (S4CS)

• Components (for passenger TOCs):
  – Effects of possessions on fare revenue
    • Cancelled Stops
    • Extended Journey Times
  – Changes in train mileage (us. –ive)
  – Also, replacement bus service costs
S4CS Compensation Formulae

- \[ NRP = \sum((WACM + NREJT) \times BF \times NRPR \times NF) \]
- \[ WACM = (CM - NRPP) \times \sum(MPW \times CS / SS) \]
- \[ NREJT = EJT \times (1 - \sum(MPW \times CS / SS)) \]
- \[ EJT = \min(SG \ Cap, AJT \times (u-v) / v) \]
- \[ BF = \sum(MPW \times SS / AS) \]
S4CS Compensation Calculations (1)

• Compare two timetables:
  – Corresponding (T1, normal TT)
  – Applicable (T2, possession-affected TT)

• For each, calculate:
  – Stop count by MP for each SG
  – Average speed for each SG
  – Mileage for each SG

• Combine with AJTs, MPWs, BFs, NFs, etc.
S4CS Compensation Calculations (2)

- Quite data-intensive and time-consuming
- Potentially error-prone
  - Initial commission to audit a set of results
  - Follow-up commission to develop a calculation tool
- Initial development in Perl
- Subsequent implementation in Excel
  - Ubiquitous
  - Familiar, user-friendly interface
# Timetable Data

- **PIF (Public Interface Format)**

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### Calculations

- **T1 Total Journey Time**:
  - SG01: 230:42:00
  - SG02: 77:38:00
  - SG03: 13:34:00

- **T2 Total Journey Time**:
  - SG01: 276:55:10
  - SG02: 100:53:00
  - SG03: 13:34:00

- **T1 Total Mileage**: SG01: 1590.72 kg
  - SG02: 813.87 kg
  - SG03: 962.12 kg

- **T2 Total Mileage**: SG01: 23049.52 kg
  - SG02: 7805.75 kg
  - SG03: 962.12 kg
## Final Results

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**Totals**:

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**Note**: The values in the table are placeholders and should be replaced with actual data. The currency symbol (£) indicates monetary values.
Implementation of Tool

• Initial Use and Feedback
  – List of TT changes rather than Applicable TT
  – De-bugging of process
  – Hampered by lack of access to underlying parameters and inputs for direct comparison with IM calculations

• Next Steps
  – Possible further refinements and fine-tuning
  – Increased use among TOCs
Increasing Network Availability

• Seven-Day Railway
  – Measures of Network Availability
    • PDI-P and PDI-F et al.
      – Measured retrospectively against CP targets
      – A more pro-active approach needed
      – Possession planning optimisation

• Industry Access Programme
Industry Access Programme (IAP)

• Developed by dedicated industry working group within Rail Delivery Group (RDG)

• Overall aims of working group:
  – Reduce costs
  – Improve service quality for rail users
Industry Access Programme

• Working Group’s new ways of working
  – Better cross-industry access planning (= IAP)
  – Improved productivity and ‘time on tools’
  – Removal of redundant/problematic assets (e.g. S&C)
  – Improved cross-industry risk management in infrastructure projects
  – Earlier involvement of RUs in enhancement scoping, planning
  – Operation of additional services

• Savings of £460m - £1bn over CP5
Industry Access Programme

• Phase 1: ‘IAP Nine Step Approach’
  – Review access requirements for CP5
  – Compare current strategy costs with alternatives
  – Assess delivery/ops trade-offs for different options
  – Obtain cross-industry agreement on preferred option
  – Agree statement on risks, benefits of preferred option
  – Formalise, publish agreed access option
  – Manage change as it occurs in CP
  – Deliver work and amended timetable
  – Review process, outcomes, lessons
Industry Access Programme

• Phase 1 piloted successfully

• Phase 2
  – Design “new cross industry access and timetable planning process”
  – Savings from reduced costs of M&R, Enhancement, S4CS and timetable and access planning
  – Benefits to users from reduced disruption

• IAP outcomes
  – Reduced costs, increased benefits
  – Consistent with Operational Philosophy
Alternative Approaches to Scheduling Possessions

• IAP unlikely to be truly optimal – best of assessed options
  – Pragmatic, empirical approach

• International best practice needed as approaches to access are refined further
  – Integrated train and maintenance scheduling
  – IMPROVERAIL project
  – PMSP solutions
  – Etc.
Summary and Conclusions

• Increasing need to reconcile competing operational and M&R network access requirements

• Automation of S4CS calculations enables RUs to check and forecast IM payments

• Need for and potential benefits of improved cross-industry access planning and cooperation in Britain reflected by IAP

• Industry can and should draw upon international experience and expertise to further enhance the access planning process
Questions?