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Performance Measurement as a driver for system improvement

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Growth✧capacity✧performance

Network level

✧The HLOS challenge: specification

Subnetwork level

✧The Route challenge: understanding and improving system performance

The HLOS challenge

High level output statement

- Capacity
- Performance
- Safety

Capacity – current output measures

- Passenger km
- Passenger train km
- [Franchised] Passenger revenue
- Freight tonne km
- Freight train km

Capacity – aggregation issues

- 4% of London commuter TOC passenger km

  = 100% of Wales local passenger km

- +50% in London area

  Peak: impossible on current network?

  Off-peak: simple on current network

The Route challenge: Understanding and improving whole system performance

- What is performance?

Timekeeping measures include

- PPM (passenger services)
- Delay minutes, cancellations
- [diagnostic KPIs via delay minute attribution]
- Customer satisfaction

The Route challenge: Understanding and improving whole system performance

- What is route capacity?
  - ❖Maximum throughput of trains – homogenous mix?
  - ❖Maximum throughput of trains – current mix?
  - ❖Maximum throughput of passengers? Tonnes?

- Capacity Utilisation Index:

  % of route capacity used with current mix+sequence of services

  Decomposes capacity utilisation issues into
  - ❖Scope to increase throughput with current mix
  - ❖Scope to increase throughput with change of mix

What is route capacity?

- CUI – plain line route sections
- What about
  - ❖ Junctions?
  - ❖ Stations – platform occupation?
  - ❖ Stations – passenger throughput?
- Capacity Utilisation Index:

  % of route capacity used, subject to current mix and sequence of services

  Decomposes capacity utilisation issues into
  - ❖ Scope to increase throughput with current mix
  - ❖ Scope to increase throughput with change of mix

What is the throughput/performance curve?

- CUI-delay relationships
- Impact of bottlenecks
- Impact of junctions, stations
- How much of the system is near ‘critical breakdown’? How detailed does analysis need to be?
- How would physical changes (additional signalling, additional trackwork, more reliable assets, shorter dwell times…) affect the throughput/performance curve?

Some initial conclusions

- Often more appropriate to tackle issues at subnetwork (route?) level
- Need KPIs which accommodate system diversity (e.g. CUI) rather than simplifying it away
- System capacity needs to be better understood
- As do relationships between use of capacity and system performance
- As do relationships between physical system changes and these throughput/performance curves