

ENGINEERING PLANNING & TIMETABLING

OVERVIEW

The aim of Engineering Planning is to **MAXIMISE** engineering opportunities and to **MINIMISE** the inconvenience to customers and passengers.

Remember when we talk about Train Operators we include both passenger and freight operators along with their own customers in turn.

Network Management

- Network Rail is charged with the management of the railway network, by the Government, by means of a set of conditions in the Network Licence.
 - Condition B7 of the “**Network Licence**” requires Network Rail to provide a network which satisfies the ‘**Reasonable Requirements**’ of those who provide ‘**Railway services**’. It is necessary to provide an annually updated Business Plan covering the next 10 years (*Condition B7.4*).
 - Condition B24 of the “**Network Licence**” requires Network Rail to maintain a register of all relevant assets including details of their condition.
- There is now general acceptance that the single biggest flaw of rail privatisation was that the network was maintained by separate Infrastructure Maintenance Companies who were all pursuing a very different agenda to achieve the same purpose.
- As a regulated company, the income is under the control of the Office of Rail Regulation who determine the revenue requirements (*income*) needed to fund the OMR (*Operations, Maintenance and Renewal*) plans.
- Early Regulation of the Rail Industry was based on a formula, which assumed that Railtrack was able to both reduce its costs each year and increase the revenue. This quickly led to a situation where it was increasingly unable to maintain the basic fabric of the network. Access time for maintenance fell and Railtrack found itself running ever faster just trying to maintain the status quo.

Operations, Maintenance and Renewal [OMR]

Operational **Control** of the network falls into two quite distinct activities – signalling and control. In many parts of the county signalling is still undertaken in the traditional manner with signallers working shifts in signal boxes. More modern installations are based on computer technology and may include a ‘control’ function. Increasingly, however we recognise the benefits from having the Network Rail and the Train Operators control organisation co-located. Controls are generally responsible for all aspects of Very Short Term Planning [VSTP] for last minute requests for new or amended access.

Maintenance

Rails - Traditionally rails were cast in 60-foot lengths and bolted together with a pair of plates and 4 bolts. These had to be removed and greased. Rails need adjusting, as they tended to ‘creep’ forward. Modern rails are still cast in 60-foot lengths but are welded together and delivered to site in 600’ lengths. Once installed, they are welded into 6000’ sections. To control expansion and contraction during extremes of heat rails must be stressed using hydraulic rams.

Points - Although we refer generically to “Points”. They are a combination of Switches and Crossings (S&C for short). Although most crossings are fixed, on higher-speed lines the nose of a crossing is designed to swing as if it were a switch. There are very rigid regimes covering point maintenance.

Equipment – Many basic maintenance activities require mechanical equipment. Where this cannot be provided then gangs of men must be provided with additional lookout protection.

Mechanised Maintenance – This is achieved using a fleet of specialised equipment – Stoneblowers (which inject fresh ballast into the formation) and Tampers (which consolidate the ballast). With the former, 1 ton of fresh ballast is carried by the Stoneblower; with the latter, fresh ballast must be dropped first. The method of achieving this has hardly changed over the years. Failure to maintain a firm foundation with good shoulders quickly leads, in very hot weather, to track buckles.

Ice – In the third rail (DC) area, during the winter months, it is necessary to spray the conductor rail with anti-freeze using special de-icing trains (**Snow & Ice**). In the overhead area (AC) there may be a need to run light locomotives through the night to prevent the build up of icicles (**Ice-Maidens**).

Autumn – The impact of train wheels on autumn leaves a fine coating, not dissimilar to Teflon, on the railhead. Special trains spray **SANDITE** (a mixture of wallpaper paste, sand and iron filings). Traditional purpose built trains are being replaced by Multi-Purpose Vehicles which can be adapted to many maintenance and light freight roles.

Structures – Bridges come in all shapes and sizes; generally the bigger they are the more complex their care and maintenance. Sometimes it is easier to undertake a complete replacement by building it alongside the line and then one weekend pushing it into place. On others the basic structure is still sound after 150 years and all that is required to keep it in first class order for another 20/30 years is for it to be refurbished.

Renewals

Ballast Cleaning – Although it sounds as if it were a maintenance activity, Ballast Cleaning (or MBC) is part of the renewal process. Ballast cleaning machine digs out the existing ballast, removes all the small (broken) material and returns large ballast back to the track. It can then be augmented by fresh ballast, prior to the track formation being renewed.

Track Renewals – The alternative to Ballast Cleaning is to remove all or part of the ballast formation. To do this, the track is completely removed using a crane and JCB type excavators brought in to remove the ballast. Fresh ballast is dropped from an adjacent line and levelled using bulldozers working to a laser alignment. New panels of track can then be laid by crane or new (usually steel) sleepers laid. Previously dropped long lengths of rail can then be manoeuvred into place.

- **Business Plan**

- Allows a Company to plan its future:
 - Traffic growth
 - Tackling known problem areas
- Smooths out investment profiles.
- Sets out how to control and reduce the OMR costs
- Provides confidence to funders

- **Local Output Statements**

- Commits the delivery of a level of **Performance Output** for each franchised train operator
- Requires Network Rail to work with train operators to develop improvement initiatives (Instrumental in gaining better maintenance access in some areas)

- **OMR Plans**

- Route Directors responsible for operational costs
 - Operational Planning is treated as if it were a 'Route'
- Territories responsible for all Maintenance and Renewals costs, supported by
 - Work activity plans
 - Investment programmes
 - Outline possession plans

- **Asset Management Planning**

- Territory Business Plans - produced by Asset Category
 - Track, Signalling, Structures, Power and Plant
 - Use of "Guide to Railway Investment Projects" [**GRIP**]
- Annualised Work Plan - produced by Territory Delivery Planning Units
 - Up to two years in advance
 - Data compiled using "Possession Planning System" [PPS]
- Annualised Access Plan – produced by the Network Access Unit [**NAU**] and Strategic Access Planning [**SAP**]

Strategic Planning Process in Practice

- Territory Delivery Planning Teams produce an Annual Work Plan
 - GRIP approved items from the Business Plan
 - M&R
 - Major Projects

- Annual Plan – Used to populate Possession Planning System [PPS] (future link into **TRAINPLAN**)
- Rules of the Route
 - Consulted in accordance with Condition D of the Network Code.
 - Drawn up by Network Access Unit based on the Annual Access Plan
 - Identifies possession opportunities, Temporary Speed Restrictions and is the register for all disruptive possessions.

Schedule 4

- Requirement to compensate passenger train operators when possessions taken which impact on a TOCs "**Firm Contractual Rights**"
- Complex process of whole timetable comparison managed by the Compensation team using S4CS
- Discounts, based on advanced notification of the possession, can be as great as 80%
- Can be very expensive, if it is wrong or minds are changed

Disruptive Possessions

It is important that you understand the meaning 'Disruptive Possession'. Any engineering maintenance or renewals work (involving either Track or Structures), which impinges upon the running of any train service, is deemed to be 'Disruptive' and the information is vital to Operational Planners when putting the timetable together.

NAU Responsibilities

- Possession strategy negotiations with our Customers.
- Ownership of Rules of the Route
- Resolution of differences of conflicting demands, e.g. Train Operator, RPDU, etc.
- Co-ordination of North/South and East/West cross-country access plans
- Manage our relationship with the Office of Rail Regulation for all changes to disruptive possession plans and timetables

Engineering Planning and the Informed Traveller

- Condition **A3** of the “**Network Licence**” requires Network Rail to provide access to information . . . all such changes to the national timetable . . . 12 weeks prior to the date such changes is to have effect. Amended train details are passed to Retail and Customer information services at T-10 to enable seat reservations

Informed Traveller Process

- T-26 weeks is the confirmation of the disruptive possession plan. (in 4 weekly chunks as the Confirmed Period Possession Plan).
- T-18 Bids from Train Operators.
- T-14 Offers back to Train Operators.
- T-12 Upload to TSDB.
- **Late possession requests – processed by Area Delivery Planning Teams/Network Access Unit**
 - Disruptive possessions after T-26.
 - Non-disruptive possessions after T-8.
 - Changes to possessions after T-5.
 - Detailed safety, performance or business justification required.
 - Reason why work cannot be planned into normal timescales.
 - Authorised signatures. (Route Director)

Challenges in Engineering Planning

- Late changes to the possession plan.
- Robustness of the plan (Schedules 4 & 8).
- Inter-regional issues including consistency of train planning approaches.

Weekly Operating Notice (produced by NAU team)

- A - Temporary Speed Restrictions
- B - Engineering Arrangements
- C - Signalling and Permanent Way alterations
- D - General Instructions & Notices

WON (Section A) - Temporary Speed Restrictions

- Details of lines affected (miles and chains)
- Shows permitted speed
- Gives reasons e.g. condition of track, condition of bridge etc
- Warning Boards
- Time Lost estimate

WON (Section B) - Engineering Arrangements

- Details of contractor (e.g. Balfour Beatty)
- Times, place of work (days, hours, miles and chains)
- Type of work e.g. overhead, track, station platform resurfacing etc
- Protection Limits, Isolating Electrical Sections

WON (Section C) - Signalling & PWay alteration

- Signals removed, altered, re-positioned etc
- Shortening of platforms
- Junction and crossover limitations, adjustments etc
- Prohibited lines due to track condition etc

WON (Section D) - General Instructions & Notices

- Sectional Appendix Changes
- Telephone numbers for key staff e.g. Police, Control
- Special arrangements e.g. scaffolding, excavations etc at stations/signal boxes.
- Operating publication amendments.

WON Distribution

- Hard copy.
- Electronic (may be interrogated using PPS)

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- Reason why work cannot be planned into normal timescales.
- Authorised signatures.

Challenges in Engineering Planning

- Relationships with other Operational Planners.
- Relationships with Customers and Suppliers.
- Late changes to the possession plan.
- Robustness of the plan (Schedule 4).
- Publication and/or Electronic WON.
- Inter-regional issues including consistency.
- Rule Changes.
- PPS.
- New computer systems.
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