

Definitions of Railway Performance Metrics

Applicability

This document has been prepared for [passenger operators, infrastructure managers, etc.]. However, its content may also be of use to others.

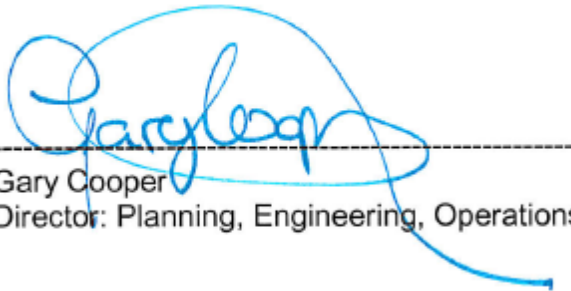
Prepared by:

Stephen Draper, National Performance Analysis Manager (Network Rail)

Content herein endorsed by PMSG:

Dean Johnson, RDG
Alex Kenney, NR
Andrew Rowe, NR
Matthew Angus, NR
Michael Thomas, NR
Jon Drea, NR
Rebekah Paul, ORR
Bill Whitton, DfT
Russell Parrish, RfL
Robert Moss, GTR
Alistair Rutter, Northern
Andy Miller, ScotRail
Jason Nash, Virgin Trains West Coast
Maureen Dominey, TfL Rail

Authorised by (NTF):



Gary Cooper
Director: Planning, Engineering, Operations - Rail Delivery Group

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1 Part 1 About this document

1.1 Responsibilities

Copies of this document should be distributed by RDG members to persons within their respective organisations for whom its content is relevant.

1.2 Explanatory note

This document contains the official definitions of the performance metrics, including those which have been formally agreed by the National Task Force (NTF) and will be used as UK official railway statistics from April 1st 2019 (the beginning of Network Rail Control Period 6). It replaces and supersedes the previous PPM definition document; last updated in 2014.

1.3 Supply

Copies of this document may be obtained from the NR Industry Performance Sharepoint site and RDG members' web site.

For further information please contact:

Network Rail National Performance Team (nrindustryperformance@networkrail.co.uk)

National Task Force Delivery Manager (dean.johnson@raildeliverygroup.com)

2 Part 2 Introduction / Background

2.1 Introduction

The UK railway industry describes the punctuality and reliability of the passenger train service using a variety of standard terms. This ensures that stakeholders and the public can compare, with confidence, the performance figures collated and published by different organisations within the industry.

This document is managed by the cross-industry Performance Measurement Steering Group (chaired by Network Rail and reporting to NTF) and any proposals for change or clarification to any metric should be made to that group.

The responsibility for producing the official performance statistics for the industry at the end of each financial period or year lies with Network Rail.

2.2 Background to CP6 metrics

Transport Focus research showed that passengers think the rail industry does not care if they are 'a bit late'. In CP5, trains are only measured at their final destination and even if they are five or 10 minutes late, they are still considered to be 'on time'. This can damage the trust some passengers have in the industry and it says to them that it lacks the ambition to give them the best possible service. The CP5 industry performance measures do not align Network Rail and Train Operating Company (TOC) objectives and they are also a different currency to the commercial performance regime.

The industry wants to improve the way it measures performance to better reflect its objective of delivering passengers to their destination on time. To re-enforce the culture of an on time railway, where every minute of delay to a passenger journey matters, the industry will move to measuring performance along the whole of a train's journey – not just at its terminating destination. The new measures should improve the trust people have with the industry as it tells them it is striving for the best possible punctuality. It also re-emphasises the importance of performance to the people who use the railway and the economy it serves.

Cross-industry agencies - including Network Rail, The Department for Transport (DfT), The Office of Rail and Road (ORR), Rail Delivery Group (RDG) and Transport Focus - worked together to define a basket of new performance measures. These were endorsed for use in CP6 by the National Task Force (NTF) in March 2016. Since this date, they have been trialled and published internally in 'shadow running' by the Network Rail National Performance Team. The metrics were officially launched to the public in July 2017.

2.3 Definitions

The industry has a clear separation between availability and performance and this dictates the timetable against which performance metrics are measured.

Availability measures the ability of the industry to offer a train service to the public and captures planned alterations to service levels made before the day.

Performance measures the ability of the industry to deliver the timetable as advertised to the public at 22:00 the day before operation. All performance metrics (unless specified otherwise) are therefore measured against the Applicable Timetable, as defined below, and always refer to the Public (rather than Working) timetable times. For further detail around the definition of the train service please refer to Appendix B: '*Matching Trains to the Applicable Timetable*' in the Electronic Appendices.

2.3.1 Applicable Timetable

This means, in respect of any particular day, the passenger timetable which reflects the working timetable for the Passenger Services required to be drawn up by Network Rail in accordance with the Track Access Conditions, as at 22:00 on the immediately preceding day, being the Timetable for that particular day, as amended from time-to-time to reflect the following:

- any amendment to the working timetable for the Passenger Services under the applicable Rules of the Route or Train Planning Rules (formerly the Rules of the Plan);
- any amendment to the working timetable for the Passenger Services under Condition H of the Track Access Conditions; and
- any amendment which is required to the Timetable to reflect the introduction, removal or alteration of a service by the Franchise Operator.

If the applicable timetable in the system at 22:00 on the previous day is not that which has been agreed between Network Rail and the Train Operating Company (TOC) and as advertised to the public, all performance metrics will be measured against the timetable that was actually advertised. Network Rail may in these incidences seek evidence from the operator as to how the public were informed of the timetable and if in doubt get confirmation from the franchising authority and ORR on which timetable to use. See FAQs document for examples of circumstances where clarification might be required.

Network Rail calculates performance metrics for all franchised operators (including MerseyRail and Rail for London concessions) plus the following open access passenger operators which are deemed by the ORR to operate a core passenger service as part of the UK national rail offering:

- Hull Trains
- Grand Central
- Heathrow Express

All the metrics include the performance of all publically advertised trains (in line with the conditions for the Applicable Timetable) operated by these companies even if the service operates fully off the Network Rail owned network (for example Dalston Junction to New Cross).

2.3.2 Grouping of trains

As part of the timetable planning process each train, at all locations on its route, is allocated to an eight digit train service code (TSC). The TSC is then used to further group the train into the below groupings which are used to report official performance statistics. A train may change TSC on route; which may also mean it changes service group – and even TOC – on departure from a booked station stop (see Appendix C: '*Grouping of trains for performance measurement*' in the Electronic Appendices for examples). The general principle, unless stated otherwise, is that TSC at the point of measurement is used.

2.3.2.1 Service Group

A service group is a collection of TSCs within a TOC with similar characteristics and is used and defined in the Schedule 8 Performance Regime. A TSC can only appear in one service group and all passenger TSCs are allocated to a service group. A service group can only contain TSCs owned by the same Train Operating Company. The decision of which TSCs make up each service group is made by the TOC and its 'Lead' Network Rail Route and then verified by the ORR as part of the access rights process. The current groups are contained in Appendix C: '*Grouping of trains for performance measurement*' in the Electronic Appendices. A service group within Schedule 8 can be further split into **contract groups** which separate the trains by day of the week and time of day into peak and off-peak services based on the definition contained in the Track Access Agreement.

2.3.2.2 Sub-Operator Groups

These groups break down the services run by a TOC into market groups (the current groups are contained in the Electronic Appendix C: '*Grouping of trains for performance measurement*'). They were set up via NTF-OG with consultation from Transport Focus. At present they are used in the performance pages on the Network Rail website and in the Delivery Plan. Each sub-operator group should be defined as a collection of unique service groups within a single Train Operating Company (see below).

2.3.2.3 Train Operating Company (TOC)

Every passenger train is operated by a Train Operating Company (in a few circumstances a train may change TOC on route) and every TSC is mapped to the owning TOC. A TOC's service definition is defined and managed by the franchising authority (e.g. The DfT or Transport Scotland) and set out in respective franchising agreements. The list of current TOCs used in official reporting of passenger performance is contained in Electronic Appendix C: '*Grouping of trains for performance measurement*'.

2.3.2.4 Sector

Every TSC is linked to a sector, which broadly describes the characteristics of the train service. Sectors are loosely based on the old divisions within British Rail and this has resulted in some TOCs having services in more than one sector. The current TSC to Sector definitions are included in Electronic Appendix C: '*Grouping of trains for performance measurement*'. When a new TSC begins operation Network Rail will allocate it to a sector based on the following logic:

- If all other allocated TSCs operated by that TOC are in the same sector then apply that sector
- If the TSC was inherited from another TSC then inherit the sector it came from
- If the TSC is funded by the Scottish Government class as Scotland
- If the TSC operates a high speed inter-city style service class as Long Distance
- If the TSC operates into / out of London class as London & South East
- Otherwise class as Regional
- If in doubt, the ORR should arbitrate

2.3.2.5 Scotland

All passenger trains which are funded by the devolved Scottish government are included in the Scotland official performance statistics. Note, therefore, that the Scotland figure does not contain all the trains that operate within Scotland (for example it excludes CrossCountry trains from Aberdeen to Edinburgh) and can contain trains which operate completely outside of Scotland.

2.3.2.6 England and Wales

All passenger train services in the applicable timetable which are not defined by “Scotland” are included in the England & Wales official performance statistics – note as above this can include train services which operate entirely within Scotland.

2.3.2.7 Defining the reporting day

For reporting, trains which originated before 00:00 are included in the day of their origin, even in cases of terminating several hours later. It is the Origin Departure Date which defines the day. The same principle applies to the inclusion of trains in period and financial year reporting.

3 Core metrics for Network Rail Control Period 6 Reliability Metrics

3.1.1 Cancellations

3.1.1.1 One line description

The percentage of planned trains which either did not run their full planned journey or did not call at all their planned station stops¹.

3.1.1.2 Definition

A train is declared to have been cancelled if it failed to stop at one or more of its planned station stops. A train is classed as a full cancellation if it ran less than 50% of its planned journey mileage (including trains that did not run at all).

A train is classed as a part cancellation if;

1. It ran at least 50% of but less than 100% of its planned journey mileage; OR
2. It completed 100% of the journey mileage but failed to stop at 1 or more of its planned station stops

Each train cancellation is then given a weighting based on its severity².

- a full cancellation has a weighting of 1
- a part cancellation has a weighting of 0.5

The 'Cancellation Score' is the sum of the 1s and 0.5s associated with the full or part cancellations or failure to stops as explained above.

The 'Cancellation Score' is then expressed as a percentage of the number of trains planned to run on that day in the Applicable Timetable.

N.B. Trains arriving 120 minutes or more late at destination do not count towards the cancellation score.

3.1.1.3 Data

Cancellations and Fail to Stops are entered into TRUST through the use of the following event types: C, P, O, D and F³. Cancellations should be entered into TRUST on the day of the event to ensure that customer information is accurate. If, however, a train which was cancelled (by the above definition) was not entered as a cancellation in TRUST it is up to the Train Operating Company to advise Network Rail in time for its inclusion in the official railway statistics.

3.1.1.4 Maths

Cancellation % = \sum Cancellation Score / planned train count

The Cancellation % should normally be quoted at 1 decimal place.

¹ Planned Station Stops always include the planned origin and terminating stations of the train

² The weighting of a full and part cancellation has been aligned to the definition used across the industry as stated in schedule 7.1 of most DfT franchise agreements.

³ C= Full Cancellation; P= Did not reach destination; O= Change of origin; D= Diverted Service; F= Failed to Stop

$$\text{Cancellation \%} = \frac{\sum \text{Cancellation Score}}{\text{planned train count}}$$

3.1.2 Severely Disrupted Days

3.1.2.1 One line description

The number of days, defined as an Applicable Timetable day, when the service was severely disrupted as measured through the level of train service actually offered to the passengers compared to the Applicable Timetable.

To be measured at sub-operator and National level only.

3.1.2.2 Definition

Defined as the number of days when more than X% of the planned services were cancelled (as defined by the reliability cancellation metric in section above).

The threshold is set at 20% for each sub-operator group and 5% for the National measure.

Days when a sub-operator group plans to run fewer than 20 trains are excluded. The exception to this is for small operators with only one sub-operator group, as indicated within the sub-operator definitions, where no lower limit is applied.

3.1.2.3 Maths

$\sum (\text{If(Cancellation \%} > \text{X\% then 1 otherwise 0)})$ covering all days within the period

Where 'X' is 20 for sub-operator reporting and 5 for National.

The number of days should always be quoted as an integer (whole number).

3.2 Punctuality Metrics

3.2.1 Train Punctuality at All Recorded Station Stops

Punctuality of the railway is measured through assessing the lateness experienced at each recorded station stop. A **Recorded Station Stop** is defined as a location in the applicable timetable with both a *planned* date time (GBTT) and an *actual* recorded date time (according to TRUST).⁴ Planned stops where the train fails to stop at the location are deliberately excluded as they are captured in the reliability measures.

The lateness of each train within the applicable timetable is assessed at the origin of the train, at arrival at each intermediate station and at termination.

Each recorded station stop is given equal weighting.

TRUST does not currently capture information at all platforms at all stations. It is anticipated that over time more platforms and stations will be added as recording points in TRUST. By the start of CP6 the intention is that the official punctuality statistics will be based on a fixed list of stations, with details of any gaps in platform coverage, which will be listed in electronic Appendix D: *Stations included in the*

⁴ Stations which are pick-up only or drop-down only are included within the measure because there are planned and actual date times within TRUST for them. However request stops are only included when they are activated and an actual arrival time is recorded.

punctuality metrics'. At present, all recorded stations stops within TRUST should be included in the measure.

The core CP6 punctuality metrics are 'On Time' and 'Time-to-15'. It is possible, however, to calculate the percentage of recorded station stops which have met any punctuality threshold, using the definitions below. In all punctuality calculations early trains should be included.

3.2.2 On Time

3.2.2.1 One line description

Percentage of Recorded Station Stops called at on time or early.

3.2.2.2 Definition

To be "On Time" the lateness at a particular Recorded Station Stop has to be less than 1 minute (i.e. time to 59secs) as measured against the Public Timetable time (GBTT) within TRUST. Early trains count towards the "On Time" total.

3.2.2.3 Maths

Count of Recorded Station Stops made with less than 1 minute of lateness / count of Recorded Station Stops

% On Time should be quoted to one decimal place.

3.2.3 Time to 15

3.2.3.1 One line description

Percentage of Recorded Station Stops called at within 15 minutes of the planned time.

3.2.3.2 Definition

To be a success the lateness of a particular Recorded Station Stop has to be less than 15 minutes (i.e. time to 14mins: 59secs) as measured against the Public Timetable time (GBTT) in TRUST. Early trains count towards the "Within 15" total.

3.2.3.3 Maths

Count of Recorded Station Stops made with less than 15 minutes of lateness / count of Recorded Station Stops

% Time to 15 should be quoted to one decimal place.

3.2.4 Time to 'X'

3.2.4.1 One line description

Percentage of Recorded Station Stops called at within 'x' minutes of the planned time.

3.2.4.2 Definition

Punctuality against any threshold can be measured. Indeed, it is preferable to show 'On Time' and 'Time to 15' in context against a continuum of punctuality thresholds. To be a success the lateness of that Recorded Station Stop has to be less than x minutes (i.e. time to 3 would be within 2mins: 59secs) as measured against the Public Timetable time in TRUST. Early trains count towards the "Within x" total.

The official statistics only include a range from 'On Time' to 'Time-to-30'. In addition figures can be quoted for 'Early' and '30 minutes or greater' to capture station stops outside of this range.

3.2.4.3 Maths

Count of Recorded Station Stops made with less than x minutes of lateness / count of Recorded Station Stops

% Time-to-x should be quoted to one decimal place.

3.3 Composite Metrics

3.3.1 Average Passenger Lateness (APL) and Total Passenger Lateness (TPL)

3.3.1.1 One line description

An estimate of how late every passenger reaches their destination station

3.3.1.2 Definition

The APL for each service group on each day or each period is defined by the current (August 2017) Performance Minutes (PM) calculation set out in the template Passenger Schedule 8 of the Track Access Agreement and currently calculated in PEARS.

Simplified definition of Performance Minutes (PM)

PM is initially calculated on arrival at each *Monitoring Point*

PM at the *Monitoring Point* =

$(\Sigma \text{ of lateness} + (\Sigma \text{ of cancelled trains} * \text{cancellation minutes})) / \text{number of planned arrivals}$
Cancellation minutes are based on 1.5 times the service frequency. Early trains are 0 minutes late. Cancelled trains is defined as any train which failed to call at this monitoring point and was recorded as a cancellation or failure to stop.

PM per day per service group = weighted Σ of PM by monitoring points

Weight of the monitoring point is based on the proportion of people in that service group alighting at that station

PM per period per service group = weighted Σ of PM by day

Weight of each day is based on the number of trains calling at monitoring points on that day

There is an example PM calculation in electronic Appendix E: 'Example PM Calculation'

Service Group definitions, monitoring points, monitoring point weights and cancellation weights are all set out in the Appendix 1 of the Schedule 8 agreement and are signed off by TOCs and NR before being approved by the ORR⁵. These values should be updated in advance of any structural changes

⁵ The methodology for assigning trains to service groups, peak types and directions is contained within "Rules for Schedule 8 Train Assignment" within Appendix F: 'APL Parameters'.

to the train service. Any updates to Schedule 8 Appendix 1 will become the basis for the APL calculation from that date forward. The current Appendix 1 data required to calculate APL is contained within the electronic Appendix F: 'APL Parameters'.

The “**expected**” number of passenger journeys per service group is calculated once a year by RDG and the ORR based on annual ticket sale and other revenue data. This data will only be adjusted within the year to reflect changes in the definition of service groups. The current expected number of passengers by service group by period is contained in the Electronic Appendix G: 'APL Passenger Numbers'. This should only be used for the purpose of calculating APL and TPL – as the numbers are an estimate.

The APL and TPL figures, as calculated through PEARS, are available periodically from Network Rail.

3.3.1.3 Maths

The following definition makes reference to the Appendix 1 of the Schedule 8 in the Track Access Agreement.

Calculate the following for each Monitoring Point where **Monitoring Point** means, in relation to a direction of a Service, a point listed in column N of Appendix 1 as a point to be used for recording lateness of Trains, and each such Monitoring Point shall be treated as a separate Monitoring Point notwithstanding that it may also be a Monitoring Point for the same Service in the opposite direction and/or for other Services;

3.3.1.3.1 Calculation of Minutes Late at a monitoring point (ML)

The Minutes Late at a Monitoring Point on a day shall be derived from the following formula:

$$\text{Minutes Late (ML)} = \Sigma L$$

Where:

L in respect of a Train is the lesser of:

- (i) the number of minutes (rounded down to the nearest whole minute) by which the time at which the Train stops at the Monitoring Point is later than the time at which that Train is scheduled in the Passenger Timetable to stop at that Monitoring Point; and
- (ii) the Cap (in minutes) for the relevant Service Group set out in column K of Appendix 1; Provided that no regard shall be had for any Train which is not recorded as stopping at the Monitoring Point; and

Σ is the sum across all those Trains in the relevant Service Group which are scheduled in the Passenger Timetable to stop at that Monitoring Point on that day which do so stop.

3.3.1.3.2 Calculation of Performance Minutes at each monitoring point (MPPM)

In respect of each Monitoring Point, the Performance Minutes Late on a day shall be calculated according to the following formulae:

$$\text{MPPM} = \text{ML} + \text{DML}$$

where:

ML is the aggregate Minutes Late at that Monitoring Point on that day for all Trains in that Service Group, calculated in accordance with this document;

DML is the deemed minutes late at that Monitoring Point on that day, derived from the following formula:

$$\text{DML} = \text{RC} \times \text{CM}$$

where:

RC is the number of Cancelled Stops recorded at that Monitoring Point; where a cancelled stop is defined as, in relation to a Train scheduled in the Applicable Timetable to stop to set down passengers at a Monitoring Point, the Train failing to trigger that Monitoring Point (except where the failure of the train to trigger the Monitoring Point is due to a malfunction of the Monitoring Point)

CM is the Cancellation Minutes for that Service Group set out in column J of Appendix 1.

3.3.1.3.3 Calculation of Service Group Average Passenger Lateness (SGAPL) in a period

In respect of a Service Group, the Average Passenger Lateness (SGAPL) for each Period shall be calculated according to the following formula:

$$\text{SGAPL} = \sum (\text{MPPM} \times \text{MPW} / \text{SP})$$

where:

\sum is the sum across all Monitoring Points in the Service Group;

MPPM is the Monitoring Point Performance Minutes in respect of each Monitoring Point in that Period, in accordance with this document;

MPW is the weighting attributable to that Monitoring Point, as specified in column O of Appendix 1; and

SP is the aggregate number of stops to set down passengers at that Monitoring Point scheduled for the Period in the Applicable Timetable for which a stop or Cancelled Stop is recorded except that if SP=0 for any Monitoring Point, then for that Monitoring Point it shall be deemed that SGAPL shall equal zero;

3.3.1.3.4 Calculation of Service Group Average Passenger Lateness Moving Annual Average (SGAPLMAA)

In respect of a Service Group, the Average Passenger Lateness (SGAPLMAA) for a complete set of 13 consecutive railway periods shall be calculated according to the following formula:

$$\text{SGAPLMAA} = \sum (\text{SGAPL} \times \text{SGBF}) / \sum (\text{SGBF})$$

where:

\sum is the sum across all periods in the 13 consecutive periods;

SGAPL is the Service Group Average Passenger Lateness in a Period calculated in accordance with this document;

SGBF is the relevant busyness factor calculated for the Period according to the following formula:

$$\text{SGBF} = \sum (\text{MPW} \times \text{SD}) / \text{AS}$$

where:

\sum is the sum across all Monitoring Points in the Service Group;

MPW is the weighting attributable to that Monitoring Point, as specified in column O of Appendix 1;

SD is the aggregate number of stops to set down passengers at that Monitoring Point scheduled in the Applicable Timetable for that Period for that Service Group; and

AS is the average number of stops per day at the Monitoring Point scheduled in the Bi-annual Timetable in respect of that Period except that if AS=0 for any Monitoring Point it shall be deemed that shall equal zero.

3.3.1.3.5 Calculation of Average Passenger Lateness (APL)

To calculate a TOC, Sector or National Average Passenger Lateness you need to combine the SGAPL for each service group based on the number of passengers alighting from each:

$$APL = \sum (SGAPL \times SGP) / \sum (SGP)$$

Where:

\sum is the sum across all Service Groups;

SGAPL is the Service Group Average Passenger Lateness in a Period calculated in accordance with this document;

SGP is the importance of that Service Group as given by the number of passengers alighting from service in the relevant period(s) specified in Appendix G: 'APL Passenger Numbers' in the Electronic Appendices of this document.

APL should be quoted to two decimal places (or in minutes:seconds format)

3.3.1.3.6 Calculation of Total Passenger Lateness (TPL)

To calculate a TOC, Sector or National Total Passenger Lateness you calculate the TPL for each service group based on the number of passengers alighting from each service group:

$$TPL = \sum (SGAPL \times SGP)$$

Where:

\sum is the sum across all Service Groups;

SGAPL is the Service Group Average Passenger Lateness in a Period calculated in accordance with this document;

SGP is the importance of that Service Group as given by the number of passengers alighting from service in the relevant period(s) specified in Appendix G: 'APL Passenger Numbers' in the Electronic Appendices of this document.

TPL should be quoted as million hours (to no finer granularity than 2 decimal places)

4 Part 4 Other Defined Industry Performance Metrics

4.1 Composite Metrics

4.1.1 Public Performance Measure (PPM)

4.1.1.1 One line description

The percentage of trains arriving at terminus within a punctuality threshold (either 5 or 10 minutes⁶) having called at all of its planned station stops

4.1.1.2 Definition

The number of trains (expressed as a percentage of the number of trains which are scheduled to be provided under the Applicable Timetable) which arrive punctually at their final scheduled destination in the Applicable Timetable measured on the basis that:

1. For this purpose, “punctually” means within a specified time of the scheduled public arrival time at destination as shown in the Applicable Timetable;
2. Any train which is a Total or Other Cancellation as measured by reference to the Applicable Timetable will be regarded as not arriving punctually;

The punctuality thresholds for trains in the Long Distance sector is 10 minutes; for all other sectors it is 5 minutes.

4.1.1.3 Maths

Count of PPM passes / count of trains planned

PPM should be quoted to one decimal place.

4.1.2 Cancellations & Significant Lateness (CaSL)

4.1.2.1 One line description

The proportion of trains which are cancelled, or arrive 30 minutes or more late, at their final scheduled destination.

4.1.2.2 Definition

The proportion of trains (expressed as a percentage of the number of trains which are scheduled to be provided under the Applicable Timetable in accordance with PPM) which are cancelled, or arrive significantly late at their final scheduled destination in the Applicable Timetable measured on the basis that:

1. For this purpose, “significantly late” means arriving thirty minutes or more after the scheduled public arrival time at destination as shown in the Applicable Timetable;
2. Any train which is a part or full Cancellation as measured by reference to the Applicable Timetable will be included in this measure

⁶ i.e. within 4:59 or 9:59

4.1.2.3 Maths

Count of CaSL failures/ count of trains planned

CaSL should be quoted to one decimal place.

4.1.3 Right Time (RT)

4.1.3.1 One line description

The proportion of trains which arrive less than a minute late at their scheduled destination having called at all its planned stations stops.

4.1.3.2 Definition

This is a train measure rather than a passenger-focussed measure which therefore accounts for punctual arrival at terminus only – and not at each station on its journey (distinguishing it from the “On Time” measure described elsewhere in the document).

To count as “Right Time”, the train must arrive at destination within 59 seconds of the scheduled public arrival time at the destination as shown in the Applicable Timetable.

Any train which is a full or part Cancellation as measured by reference to the Applicable Timetable is regarded as a Right Time Failure.

4.1.3.3 Maths

Count of terminating station stops made with less than 1 minute of lateness /count of trains planned

Right Time should be quoted to one decimal place.

4.2 High Frequency Services Metrics

Measurement of the delivery of high frequency train services which combines both the regularity and level of delay on the journey. Measures specifically designed for high frequency flows; which the majority of passengers see as a “turn-up-and-go” service rather than relying on the timetable. Therefore, these metrics are not measured against the Applicable Timetable.

4.2.1 Metro Services Journey Time

4.2.1.1 One line description

‘Metro’ service performance is reported through the following two metrics:

1. Passenger journeys made within *advertised* time (%)
2. Average Passenger Journey Time (minutes)

4.2.1.2 Definition

The Metro measures are applicable to very high frequency parts of the network - where the timetable is not relevant to the passengers as they perceive the railway as a ‘turn-up-and-go service’. They are only appropriate in parts of the network where the service frequency **is at least 10 trains per hour**.

For both metrics, a passenger's journey is measured from *arrival* at their *boarding* platform to *arrival* at their *alighting* platform. Therefore, the actual evaluated journey time for each comprises both a **platform wait time (PWT)** and **on train time (OTT)** element.

For Metric 1 – **Passenger journeys made within advertised time** - this actual journey time (PWT + OTT) is then compared to an **Advertised Journey Time**. For details about how the Advertised Journey Time is defined please see Appendix H: *Metro Measures Parameters* in the Electronic Appendices.

Metric 2 - **Average Passenger Journey Time** - is quoted in the context of an '*Expected*' Journey Time. Many passengers on high frequency 'turn-up-and-go' areas of the network will be frequent travellers who have experience of making the assessed journey and will have an expectation of how long it usually takes. Their expectation of the PWT element of the journey time will be around 50% of the timetabled headway; since on average they will arrive half way between trains. The '*Expected Journey Time*' is therefore less than the '**Advertised Journey Time**' which uses the full headway PWT. For details about the industry preferred way of calculating the Expected Journey Time please see Appendix H: *Metro Measures Parameters* in the Electronic Appendices.

Both measures are evaluated for a period of time within a day that a qualifying high frequency is being offered (e.g. 180 minutes for the morning peak) and it is assumed passengers arrive evenly distributed across that period. Each 60 second block within that time period equates to one set of passengers and performance is calculated for each of these sets of passengers. For details about the evaluated time frame, please see Appendix H: *Metro Measures Parameters* in the Electronic Appendices.

On a completely evenly spaced timetable, with passengers arriving at an even distribution in each minute, 100% of passengers will have a journey time which meets the '**Advertised journey Time**' and the '**Average journey time**' will equal the '*Expected Journey Time*'.

How to calculate Metro measures:

For applicable station (A) to station (B) flows the measure is calculated as follows:

- Assume that the arrival of passengers at Station A platform is evenly distributed – i.e. the same number turns up in each 60 second interval of the assessed time period (*this could be an hour, a peak or a day*).
- For each minute of the assessed time period identify the next train to depart from station A (*only include trains which successfully completed the journey to station B*) and therefore the average wait time of passengers who turned up in that minute (*i.e. 30 seconds before to 30 seconds after*).
- If the wait time is greater than or equal to 20 minutes assume a journey time of 50 minutes (i.e. a penalty is applied)
- If wait time is less than 20 minutes, look at the performance of the train they then caught to find the time taken to reach station B and then combine their PWT with the OTT to understand their total journey experience
- METRIC 1 – Passenger Journeys made within advertised time (%)
 - This journey experience is then compared to the Advertised Journey Time.
 - If the variance is negative (i.e. their actual journey time is less than the advertised time) then those passengers who arrived in that minute are assumed to be in the pot of people whose expectation was met
 - The measure is then evaluated across all minutes in the assessed period (e.g. 180 minutes in the AM peak) and the volume of passengers whose expectations were met are added together and then divided by the count of assessed minutes to understand the proportion of passengers who travelled from Station A to Station B whose journeys were made within the advertised time.
- METRIC 2 - Average Journey Time (minutes)
 - Take the average of all actual journey times within the assessed time period ((e.g. 180 minutes in the AM peak)

The measures are used predominantly at the individual station-to-station flows level but may be reported at a service group or TOC level by doing a weighted sum of a subset of key station-to-station flows – weighted by passenger numbers or train counts.

4.2.1.3 Maths

Proportion of passengers' journeys made within the advertised journey time:

(Count of minutes where (Wait time + On Board Time) <= advertised journey time)/ count of minutes in assessed period

Average Journey Time (minutes):

Mean (Wait time + On Board Time) for each minute

5 Index of Documents Contained within Electronic

Appendices:

- 5.1 A: Document Control
- 5.2 B: Matching Trains to the Applicable Timetable
- 5.3 C: Grouping of Trains for Performance Measurement
- 5.4 D: *Stations Included in the Punctuality Metrics (Not currently required)*
- 5.5 E: Example PM Calculation
- 5.6 F: APL Parameters
- 5.7 G: APL Passenger Numbers
- 5.8 H: Metro Measures Parameters

6 Frequently Asked Questions

Q: Are non-franchised operators included?

A: Yes, they are

Q: Once there is one failure to stop (0.5 x cancellation), what disincentive is there to prevent further fail-to-stops?

A: There is no real disincentive, other than inconveniencing passengers. On current definitions, there is a potential performance impact on AML – and therefore TPL – if the missed stop is a monitoring point (1.5x monitoring point weighting for failure to stop).

Q: In terms of measuring the passenger impacts, what about short forming of trains?

A: The DfT has a short formations performance regime.

Q: How will small operators be treated under the “severe days” measure (e.g. Caledonian Sleeper with only 6 trains per day?) Could it use cancellations per quarter, rather than an individual day?

A: The ORR can liaise with smaller operators to understand if they wish to be treated differently for this measure.

Q: Are request stops included in the punctuality measures?

A: Yes, in instances where a train has stopped and has both a planned and actual time recorded.

Q: Should lateness be measured against the WTT or GBTT

A: Punctuality should be measured against the public-facing passenger timetable (GBTT)

Q: What about non-stations which have a GBTT time – won't they be included?

A: Only events with passenger activity should be included in the punctuality measures (e.g. pick up, drop off etc.). Work is currently being undertaken to clean up the data in PSS to ensure there are no GBTT times for non-station stops.

Q: How will re-starts/ re-formations be treated in the cancellation stats (with a different headcode/ train ID)?

A: Change in Service Code will not impact on it but a change in Train ID would treat the journey as two separate elements.

Q: What about trains cancelled before 22:00 the day before?

A: Punctuality measures are based on the Applicable Timetable definition – i.e. trains cancelled prior to 22:00 the night before are excluded.

Q: TPL is dependent on passenger numbers – so will inevitably just mirror trends in passenger numbers

A: Yes, but *Average Passenger Lateness* (APL) is independent of passenger numbers and so is a better measure for the industry to assess for trending. APL is the customer facing measure and will be described alongside details of passenger growth incumbent in the measure.

Q: The metro measure is problematic – in particular in terms of regulation decisions on a shared network with differing incentives

A: The metro measure is only applicable to small pockets of the network in London and other major cities – where passengers deem the service to be turn-up-and go and that the actual

timetable is not relevant. Trials have shown that a minimum of 10tph is necessary for the Metro measure to work best. Regulation policy will need to change within these core areas where the metro measure is prevalent. However, most operators in that scenario are likely to be using the same measure. Most services will not be metro for the entirety of their journey, therefore the neighbouring areas to the metro zones will be subject to some difficult regulation as some trains may be out of path, having been regulated according to the metro principles.

Q: Is it "Right Time" or "On Time"?

A: On Time refers to punctuality at all recorded station stops – as per the new metric for CP6. This distinguishes the measure from the prevailing "Right Time Starts" or "Right Time at Terminus measures".

Q: What proportion of stations do we need to have recording points for? Is there a minimum threshold/ target to hit?

A: There is no target/ minimum requirement. However, in light of the fact we want to be more transparent we should, as an industry, strive towards the largest coverage possible.

Q: Severely disrupted days is measured at sub-operator level. Is it possible to amend the current list of sub-operator groups?

A: Routes and Operators were encouraged to review the make-up of their sub-operator groups and feedback any changes by March 31st 2017.

Q: How often are the contractual monitoring points revised for AML? – how can we baseline performance for trending if they keep changing

A: Can change at any time – but generally through ORR approval. Can't be baselined.

Q: What happens if a service group has different stopping patterns – does AML assume the same passenger loadings for station X in each case?

A: Yes

Q: Are the 120+ min late services included in the cancellations metric?

A: No

Q: Are origins included in the punctuality metric? Why?

A: Yes they are. Departing on time from origin is important – just as arriving punctually at all advertised station stops is.

7 Dealing with Specific Timetabling Scenarios

Outlined below are some of the more common questions on how Performance Measurements handles circumstances when the Applicable Timetable is in question

7.1 Scenario 1

An emergency timetable was agreed between Network Rail and the TOC prior to 22h00, but none/not all the revised schedules were uploaded into TOPS/TRUST by the cut-off

Metrics should be measured against the emergency timetable, provided the changes were advertised to the passengers the same evening.

Evidence, in the form of the revised timetable or at least a summary of the changes by route, the time period they were being revised for, which demonstrates that this was agreed before 22h00 (for example the relevant information uploaded to the NRES website at 22h00), will be needed.

7.2 Scenario 2

An emergency timetable was agreed between Network Rail and the TOC prior to 2200, but some/all of the revised schedules were uploaded into TOPS/TRUST incorrectly

Metrics should be measured against the emergency timetable, provided the changes have been advertised.

Evidence required will be the same as in Scenario 1

7.3 Scenario 3

A revised timetable was issued for weekend engineering works, but the timings in TOPS failed to reflect this

Metrics should be measured against the revised timetable.

Evidence needed would be the timetable booklet (in electronic form) showing the correct timings and TRUST printouts showing the incorrect plan as measured against.

7.4 Scenario 4

Neither the public timetable as advertised nor TOPS/TRUST reflected the GBTT timings the TOC requested in its timetable bid

Metrics should not be altered.

Typically this applies when the public differential is applied incorrectly when the schedules are made for GBTT. As far as the passenger is concerned the train should run to the times advertised, regardless of whether they are incorrect due to a process error.

7.5 Scenario 5

We ran VSTP schedules on the day to deal with the disruption that occurred

Metrics should not be altered.

It is measured against the plan as agreed the night before, regardless of what happened on the day.

7.6 Scenario 6

An emergency timetable was agreed between Network Rail and the TOC prior to 22h00 and the schedules were uploaded into TOPS/TRUST correctly. However, on the day the subsequent emergency timetable was further amended because of the return to use of some of the resources / assets that were the cause of the emergency timetable

Metrics should be measured against the emergency timetable, provided the changes have been advertised.

Evidence required will be the same as in Scenario 1

7.7 Scenario 7

An emergency timetable was agreed between Network Rail and the TOC prior to 22h00 and the schedules were uploaded into TOPS/TRUST correctly. However, on the day the emergency timetable was withdrawn because of the full return to use of the resources / assets that were the cause of the emergency timetable

Metrics should be measured against the emergency timetable, provided the changes have been advertised.

Evidence required will be the same as Scenario 1.

7.8 Scenario 8

An emergency timetable was not agreed between Network Rail and the TOC prior to 22h00 and the schedules were not uploaded into TOPS/TRUST correctly. However, on the day an emergency timetable was instigated that spans more than one service day

Metrics should be measured against the timetable that existed prior to 22h00 the previous night.

7.9 Scenario 9

An emergency timetable was agreed between Network Rail and the TOC between 22h00 and 04h00 and the schedules were uploaded into TOPS/TRUST correctly.

Metrics should be measured against the timetable that existed prior to 22h00 the previous night.

8 Dealing with Specific System Issues

8.1 Scenario 1

We've had a major TRUST outage at a key origin/destination point

Metrics can be altered, depending on the circumstances.

In theory, the DA specialist in the Route should manually infill any missing data at reporting points in TRUST. Unfortunately, there are occasions when this doesn't happen. In these cases, Network Rail performance systems have certain rules on how to treat missed reporting points which were the origin or destination, and will infer whether or not a train reached its destination or departed its origin from the record at the previous or following reporting point. On the occasions where information is supplied that shows that this is not to be appropriate, the train record can be manually edited.

8.2 Scenario 2

The record for that service in TRUST is incomplete

Metrics can be altered, depending on the circumstances.

We know that TRUST isn't perfect, especially with regard to trains which fail to stop at a station (FTS). When information is received that will complete the record, editing at train level may be appropriate.

8.3 Scenario 3

FTS is recorded at a location in TRUST but the service was not advertised to the public as stopping at this location

Metrics can be altered, as this should not be seen as a genuine FTS.

This scenario can occur when a train is shown as calling at a station purely for operational purposes – e.g. reversing, or changing traction type, or to pick up staff. Evidence, usually in the form of the timetable for the train(s) affected, will be needed. On these occasions, the train record can be manually edited.