NRE Information Feeds
Developer Pack

Document Ref:
NRE Feeds_Developer Pack v.01-02

Version History

Version	Date	Author	Comment
01-00	03/03/2014	Lindsay Bleakley	1st Final Draft
01-01	29/10/2014	Lindsay Bleakley	Updated Dates etc.
01-02	11/06/2015	Lindsay Bleakley	Updated Dates etc.

Contents

1 Introduction

1.1 Scope of this Document

1.1.1 The scope of this document is to provide a summary of the different information feeds that National Rail Enquiries (NRE) can provide to developers and other users, for use in digital products.

1.2 About NRE Information Feeds

1.2.1 NRE information feeds are derived from three primary engines called Knowledgebase (KB), Darwin and Online Journey Planner (OJP). These engines power the NRE website, apps, products and services, also providing data feeds that are used by train companies across their range of customer touch points.

1.2.2 Third party developers also use the feeds across a range of apps, websites, screens, displays and software. Darwin provides the real-time train running information to in-station screens across the country.

*See Appendix A for more detailed information about Darwin.

1.3 Information Feeds & Products Available:

Knowledgebase
Incidents XML (Service Disruption)
Incidents XML (Engineering Work)
National Service Indicator (NSI) XML
Stations XML
Stations Made Easy (SME) XML
Promotions XML
Restrictions Xml
Ticket Types XML
Train Operating Companies (TOCs) XML

Darwin
Darwin Public CIS (PubCIS)
Darwin Webservice (Public Version)
Darwin Webservice (Staff Version)
Darwin Push Port
Darwin Timetable Feed
Online Journey Planner
Real Time Journey Planning (RTJP) Webservice
Disruptions Webservice
Print Your Own Timetable
Season Ticket Calculator

2 Knowledgebase XML Feeds

2.1.1 Knowledgebase is a central repository of contextual information held in an online database. It is the platform through which much of the content on the NRE website is managed and updated. Where journey planner and Darwin assist customers with train times and prices, Knowledgebase contains complementary information about travelling by rail, such as station facilities, available ticket types and disruption causing changes to train times.

2.1.2 Knowledgebase XML feeds have been made available for 3rd parties to use across their range of digital customer facing platforms. The XML feeds are all 'request and respond' services whereby the latest information is requested at an appropriate frequency.

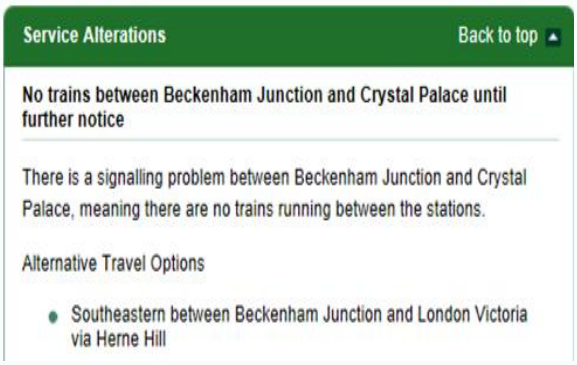
2.2 Knowledgebase Feeds Available:

Service Name	Real Time	Available	Terms	Free of Charge
Incidents XML (Service Disruption)	✓	✓	NRE Licence	Yes
Incidents XML (Engineering Work)		✓	NRE Licence	Yes
National Service Indicator (NSI) XML	✓	✓	NRE Licence	Yes
Stations XML		✓	NRE Licence	Yes
Stations Made Easy (SME) XML		✓	NRE Licence	Yes
Promotions XML		✓	NRE Licence	Yes
Restrictions XML		✓	NRE Licence	Yes
Ticket Types XML		✓	NRE Licence	Yes
Train Operating Companies (TOCs) XML		✓	NRE Licence	Yes

2.3 Incidents XML – (Service Disruption)

2.3.1 The Service Disruption feed is contained within the Incidents XML alongside engineering works information. The service provides live updates 24/7 about disruptions that are affecting train running. It contains details of the problem, the expected impact to the customer and advice on alternative travel options. Updates to the feed are delivered in real time from the NRCC who receive the information from TOC control centres and Network Rail among other sources.

NRE Website

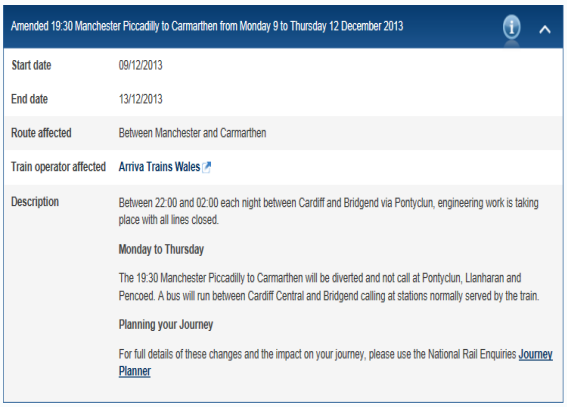


Southern Website

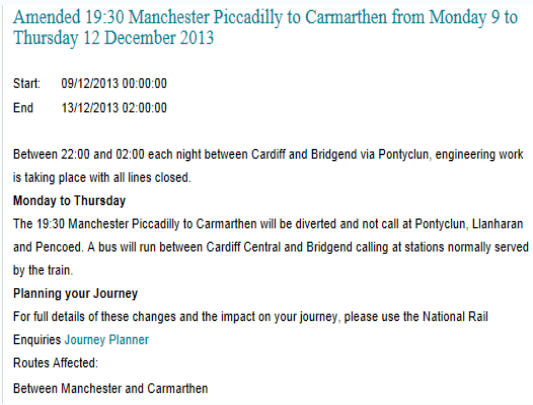
2.4 Incidents XML – (Engineering Works)

2.4.1 The Engineering Works feed is contained within the Incidents XML alongside service disruption information. The Service details all planned engineering work on the network, information about the location of the work, routes affected and any alternative travel arrangements available for customers.

2.4.2 Information displayed in this feed is disseminated from a variety of primary sources, including Network Rail and the relevant TOCs. To ensure accuracy, TOC and Network Rail information is cross-referenced so discrepancies are identified and validated before publishing.



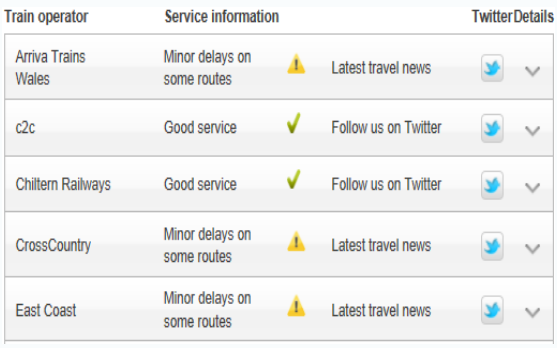
NRE Website



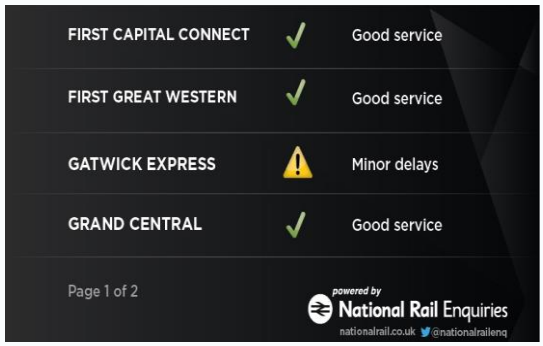
Arriva Trains Wales Website

2.5 National Service Indicator XML

2.5.1 The National Service Indicator is a rainbow board style service that provides an overview of the operating status for every train company as either Good, Minor Delays or Severe Delays. This Service can be used in conjunction with the Incidents XML as each status can be linked to a related disruption alongside other configurable service messages, such as a temporary timetable in operation.



NRE Website

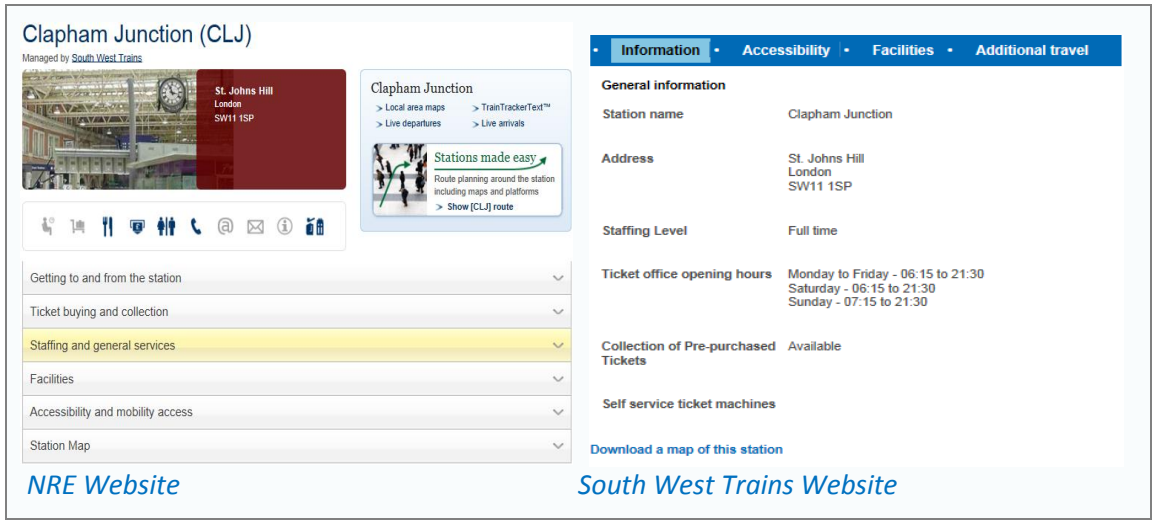


ECN Live Digital Screens

2.6 Stations XML

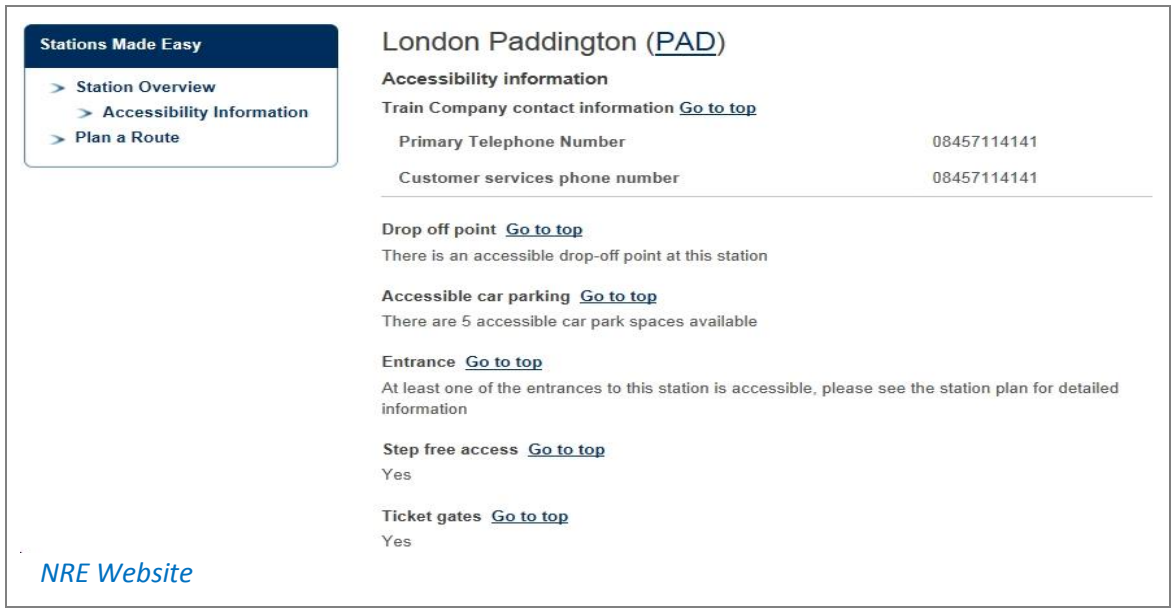
2.6.1 The Stations XML is a knowledgebase feed that contains information about all GB station facilities, including how to get to and from the station, services / amenities available and accessibility. The service can access information about all stations; those for a given TOC or just for a single station.

Also available is the Stations Made Easy feed which contains station maps with corresponding accessibility information for each station on the GB rail network.



2.7 Stations Made Easy (SME) XML

2.7.1 The Stations Made Easy XML provides accessibility information for each and every railway station on the national network. The information within this feed relates specifically to the availability of disabled access and disabled facilities at stations.

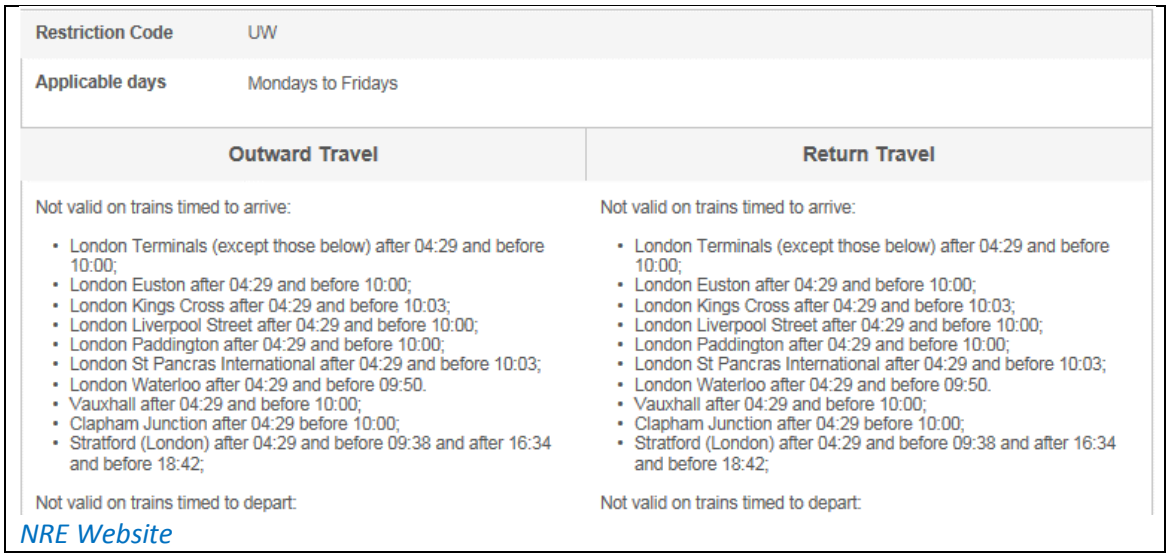


2.8 Promotions XML

2.8.1 The Promotions XML is an information feed that gives details of ticket and travel promotions being run in conjunction with train ticket sales. It contains information about promotions by other train operators as well as other by 3rd parties and includes information about railcards, PlusBus and ticket deals.

2.9 **Restrictions XML**

2.9.1 This feed provides information about the specific validity and restrictions of tickets based on their restriction codes. The feed provides detailed information about the times when a customer can travel and the stations which are valid for on that ticket.



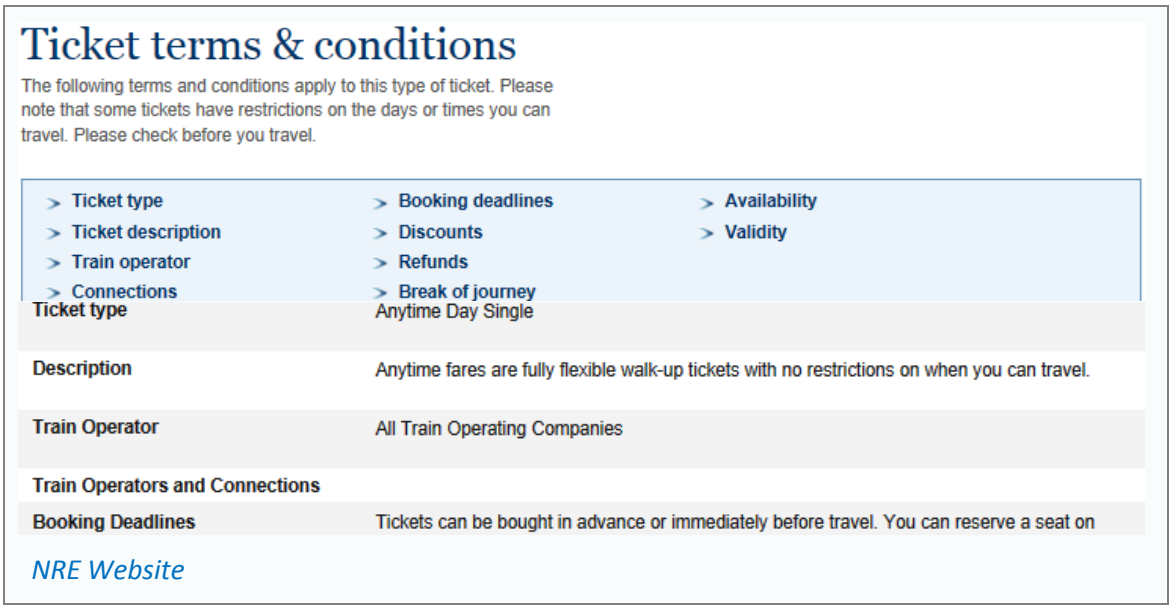
Restriction Code	UW
Applicable days	Mondays to Fridays

Outward Travel	Return Travel
Not valid on trains timed to arrive: • London Terminals (except those below) after 04:29 and before 10:00; • London Euston after 04:29 and before 10:00; • London Kings Cross after 04:29 and before 10:03; • London Liverpool Street after 04:29 and before 10:00; • London Paddington after 04:29 and before 10:00; • London St Pancras International after 04:29 and before 10:03; • London Waterloo after 04:29 and before 09:50. • Vauxhall after 04:29 and before 10:00; • Clapham Junction after 04:29 before 10:00; • Stratford (London) after 04:29 and before 09:38 and after 16:34 and before 18:42; Not valid on trains timed to depart:	Not valid on trains timed to arrive: • London Terminals (except those below) after 04:29 and before 10:00; • London Euston after 04:29 and before 10:00; • London Kings Cross after 04:29 and before 10:03; • London Liverpool Street after 04:29 and before 10:00; • London Paddington after 04:29 and before 10:00; • London St Pancras International after 04:29 and before 10:03; • London Waterloo after 04:29 and before 09:50. • Vauxhall after 04:29 and before 10:00; • Clapham Junction after 04:29 before 10:00; • Stratford (London) after 04:29 and before 09:38 and after 16:34 and before 18:42; Not valid on trains timed to depart:

NRE Website

2.10 **Ticket Types XML**

2.10.1 The Ticket Types XML contains information about what ticket types are available and the general conditions associated with that ticket; 'What does off-peak mean?' or 'Can I break my journey?' for example.



Ticket terms & conditions

The following terms and conditions apply to this type of ticket. Please note that some tickets have restrictions on the days or times you can travel. Please check before you travel.

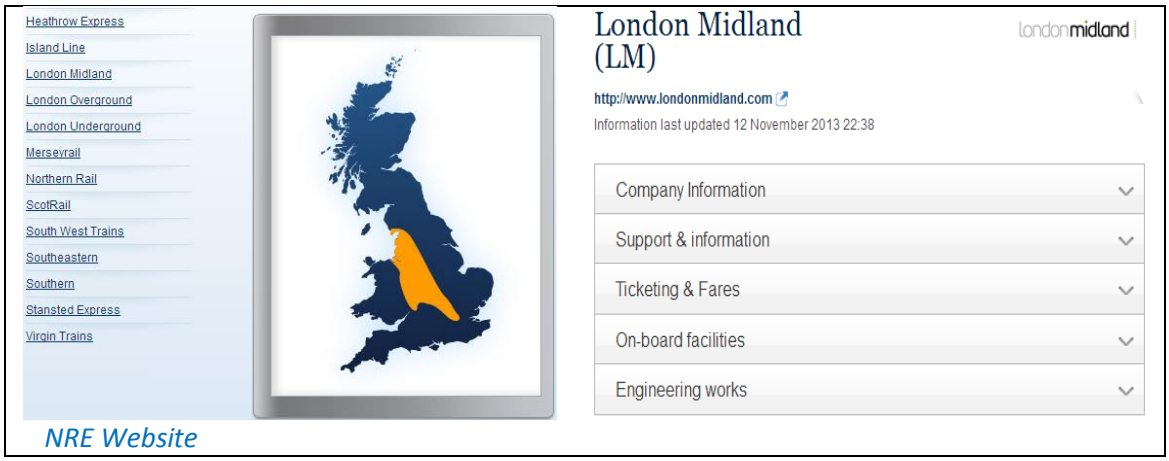
- Ticket type
- Ticket description
- Train operator
- Connections
- Booking deadlines
- Discounts
- Refunds
- Break of journey
- Availability
- Validity

Ticket type	Anytime Day Single
Description	Anytime fares are fully flexible walk-up tickets with no restrictions on when you can travel.
Train Operator	All Train Operating Companies
Train Operators and Connections	
Booking Deadlines	Tickets can be bought in advance or immediately before travel. You can reserve a seat on

NRE Website

2.11 Train Operating Companies XML

2.11.1 The TOCs XML contains information about each of the Train Operating Companies including details for the customer on how to contact the relevant department if in need of support. Information can only be requested from the feed on a TOC by TOC basis or in a single request.



NRE Website

3 Darwin Feeds

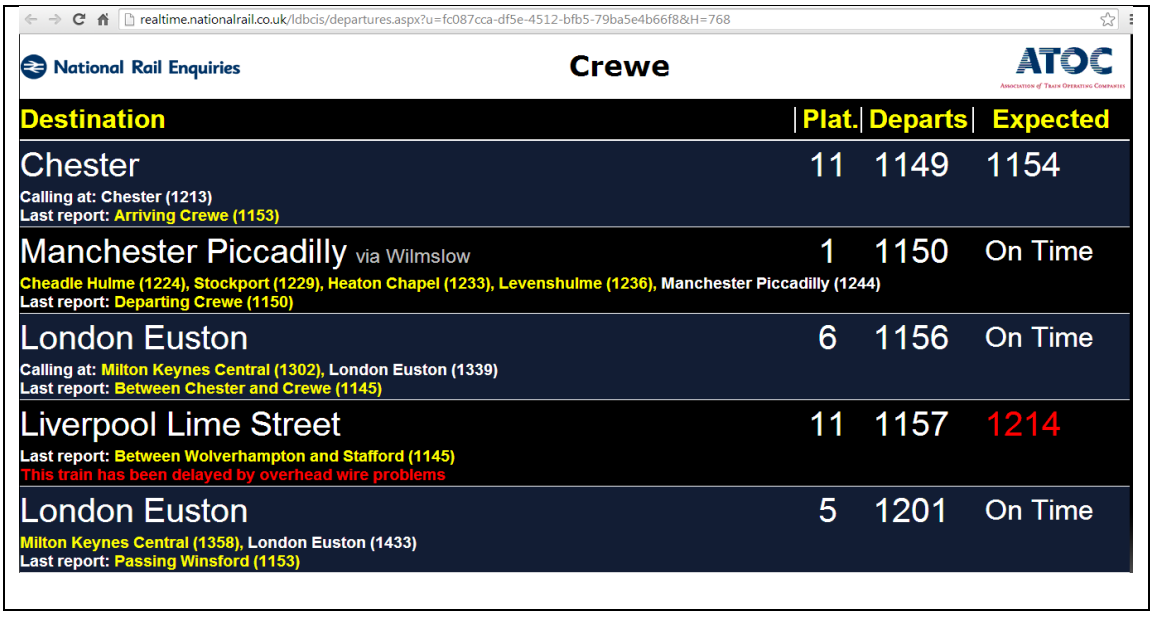
3.1.1 National Rail Enquiries offer a number of feeds which draw information directly from Darwin. Darwin holds the original planned schedules, updated schedules and any new schedules which TOCs may introduce. Darwin logs movements and forecasts received and makes its own forecasts as well as providing a repository for other information NRE generates such as station messages and train alerts.

3.2 Information Feeds Available:

Name	Real Time	Available	Terms	Free of Charge
Public CIS (PubCIS)	✓	✓	NRE OGL	Yes
Darwin Webservice (Public Version)	✓	✓	NRE OGL	Yes[1]
Darwin Webservice (Staff Version)	✓	2015	NRE OGL	Yes
Darwin Push Port	✓	✓	NRE OGL	Yes
Darwin Timetable	✓	✓	NRE OGL	Yes

3.3 Public CIS (PubCIS)

3.3.1 Public CIS is a webpage that provides CIS style live departures or arrivals information for display on digital screens. It is fully 'mobile' and can be presented anywhere that there is an internet connection and screen that can be linked to a server. We can put a timed offset on the screens. The offset is useful when the location of the screens is such a distance away from the train station.



[1] Free of charge subject up to 5m enquiries per railway period, charged at cost recovery rate thereafter.

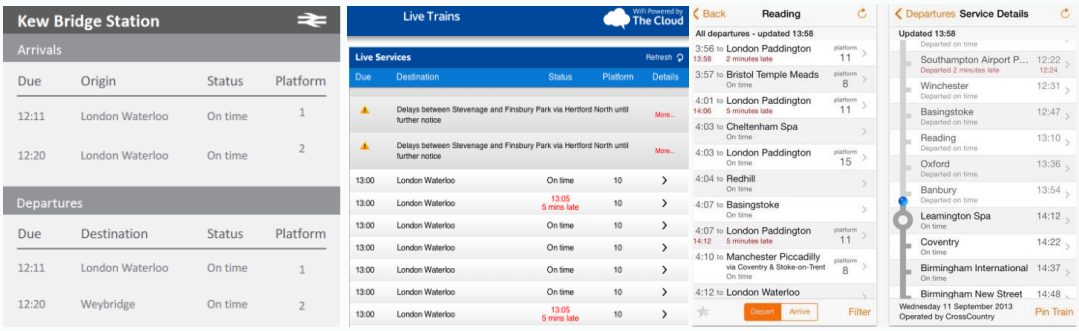
3.4 Darwin Webservice (Public Version)

3.4.1 The Darwin Webservice (also known as LDB Webservice) is a ready to use 'request and respond' API that provides live train departures and arrivals, including delay and prediction information, from any given station. Information retrieved from the webservice can be formatted and displayed in the style, branding and colours of the users' choice. The feed also includes platform numbers where available.

3.4.2 An industry programme called the "Darwin CIS Programme" is connecting our Darwin information feed with the screens in stations across the country. This is due to be complete by 31st March 2015. Once live, the information on screens at stations and that delivered through this feed will be completely consistent. Platform numbers will also be more widely available in Darwin at this point, thus will also be transmitted through the Darwin Webservice feed.

Recommended Uses:

Mobile Apps | Websites | Screens | Other Digital Displays



Santander Offices – Brentford *The Cloud Networks –WiFi Service* *Uk Train Times - Mobile App*

3.5 Darwin Webservice (Staff Version)

3.5.1 The Darwin Webservice 'Staff Version' is an unfiltered version of the 'Public Version'. It is also a 'request and respond' API feed that provides live train departures and arrivals, including delay and prediction information, from any given station. This version, however, does not give ready to use information; rather it requires a great deal of translation of fields in order to display the information accurately.

Recommended Uses:

Mobile Apps | Websites | Software

***PLEASE NOTE:** The Darwin Webservice (staff version) is planned to be made available before the end of 2015.

3.6 Darwin Push Port

3.6.1 The Darwin Push Port is an XML push feed that continuously streams information about the creation of, and changes to, train schedule records, together with train running predictions made by Darwin. The Push Port can be filtered to a specific area of interest, or to provide information

for the entire country. Either way, the information delivered is complex and must be properly interpreted before presentation to end users.

3.6.2 Push Port requires the user to build a database capable of capturing extremely high volumes of information, as well as a query engine to draw the information from your database. There is a large amount of interpretation work involved in this; however the user has flexibility to apply the information to any product within the limitations of their own infrastructure.

Recommended Uses:

High Volume Use Customer Products | Data Capture & Analysis | Research & Development | Software | Screens

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3.7 Darwin Timetable

3.7.1 The Darwin Timetable is an XML push feed that is a filtered version of the Darwin Push Port. It contains all schedule changes made in real time, such as train cancellations, train service alterations and/or additional train services created. The Darwin Timetable Feed does not include any information about live train movements or delays; it simply republishes the entire train schedule each time an amendment to the schedule occurs. The feed can be used to inform journey planners with up-to-date schedules rather than static timetabled information. All the conditions that apply to the Push Port also apply for the Timetable Feed.

Recommended Uses:

Software | Research & Development

4 Online Journey Planner (OJP) Services

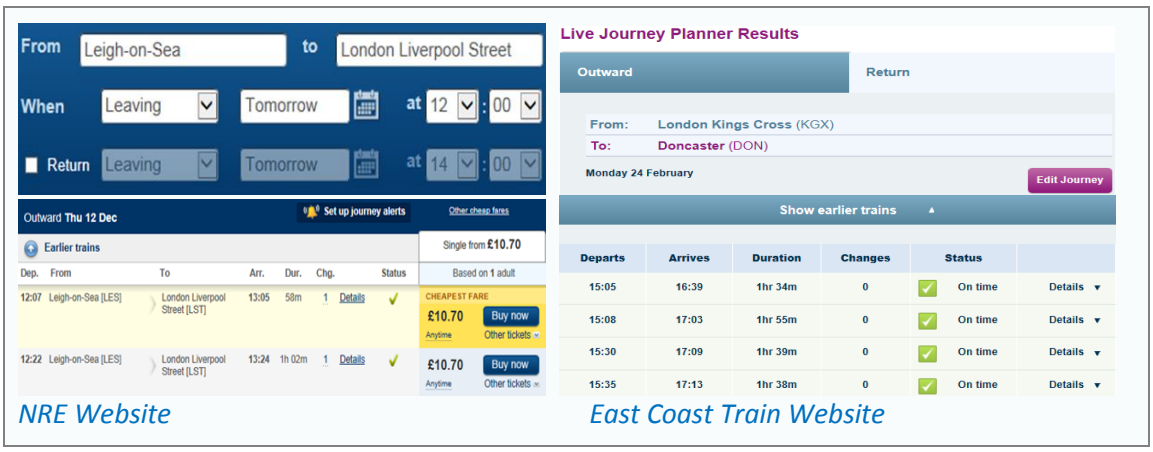
4.1.1 The Online Journey Planner (OJP) is a software tool that uses a combination of timetabled information, live train running information from Darwin, customer location and ticket pricing to deliver a variety of journey planning services tailored to the customer's specific needs. The online journey planner powers all journey planning on NRE apps, www.nationalrail.co.uk as well as providing many of the pages of the website.

4.2 Information Feeds Available:

Name	Real Time	Available	Terms	Charge Free
Real Time Journey Planner Webservice	✓	✓	NRE Licence	No
Disruptions Webservice	✓	✓	NRE Licence	Yes
Season Ticket Calculator		✓	NRE Licence	No
Print Your Own Pocket Timetable		✓	NRE Licence	No

4.3 Real Time Journey Planner (RTJP) Webservice

4.3.1 The RTJP Webservice is a 'request and respond' XML feed that delivers point to point or multi-leg journey planning between any two stations. It derives information from Darwin meaning that when enquiries are made, real time answers are returned. Where a journey is 'broken' by a disruption or timetable change, the journey planner can be instructed to 'mend' the journey by providing the best alternative route. The webservice includes the option to select a postcode as the origin or destination.



NRE Website *East Coast Train Website*

Recommended Uses:

Mobile Apps | Websites | Touch Screens Displays

4.3.2 Cycling Restrictions Webservice

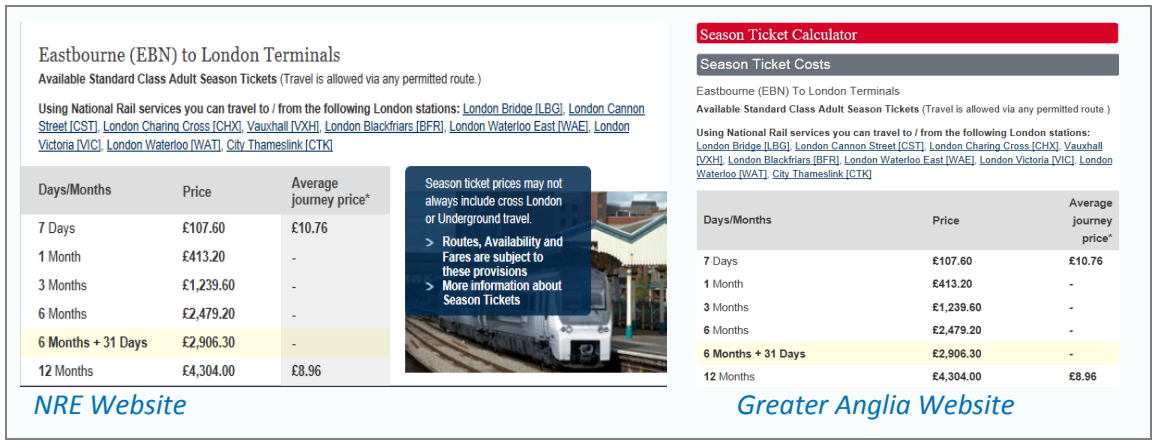
The Cycling restrictions webservice is a function of the version 2 of the RTJP Webservice. The service uses a 'request and respond' based API to deliver cycling restriction information for any user specified train journey. This service is not currently scoped to be separated out from the RTJP Webservice, but is an option in the event that there is demand for this as a separate service.

4.4 Disruptions Webservice

Through this service the Online Journey Planner consolidates the three different sources of disruption information into a single service. The webservice combines contextual information from Knowledgebase, with delay and reason code information from Darwin and the online journey planner. Requests about disruption can be made to the service on a 'per station' or 'line of route' basis. The enquiry will return an answer regarding any and all the disruptions affecting that station or line of route at the given time.

4.5 Season Ticket Calculator

4.5.1 The Season Ticket Calculator is simple application that calculates the average journey price for a customer's season ticket over a given number or days or months. It is available in NRE branding or as a white-label product in your colours and branding at an additional fee.



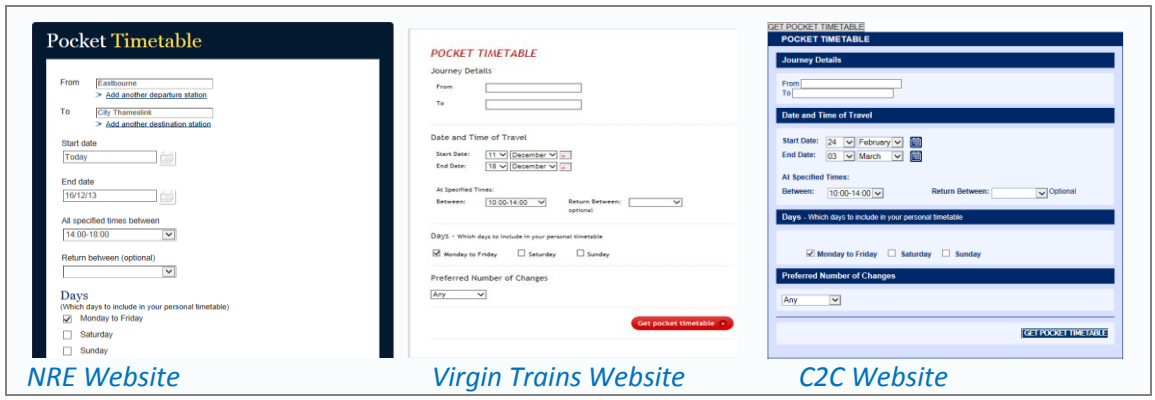
NRE Website *Greater Anglia Website*

Recommended Uses:

Mobile Apps | Websites | Touch Screens Displays

4.6 Print Your Own Pocket Timetable

4.6.1 Print Your Own Pocket timetable (PYOT) is a service that allows the user to identify a specific route for which it formulates a simple timetable in print friendly format. It is available in NRE branding or as a white-label product in your colours and branding at an additional fee.



NRE Website *Virgin Trains Website* *C2C Website*

Recommended Uses:

Websites

5 Services In Development

5.1.1 At National Rail Enquiries we have a continuous development roadmap which is influenced directly by customer research, digital analytics and the development of new and disruptive technology.

5.2 Services Pending

Service Name	Real Time	Available
Station Information Webservice		2015

5.3 Station Information Webservice

This service uses our Online Journey Planner engine to deliver station information through a 'request and respond' webservice. The Station Information Webservice is currently in development but will be available for licence in 2015.

6 Contact Us

6.1 Service Licence Requests

6.1.1 To receive further information about Nation Rail Enquiries, our products, or for questions about licensing any of our information services, enquiries should be directed to:

Client Relationship Manager
National Rail Enquiries
Association of Train Operating Companies
2nd Floor
200 Aldersgate Street
London EC1A 4HD
inforservices@nationalrail.co.uk

7 Appendix A

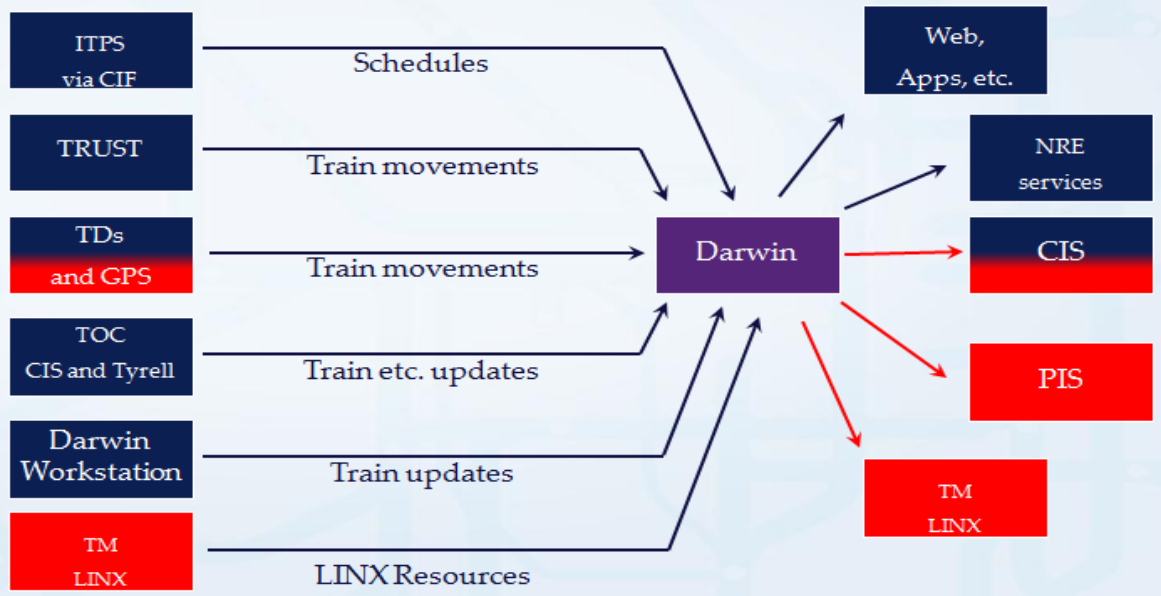
7.1 Darwin Overview

7.1.1 Key to the services we deliver is Darwin, which provides real time predictions of train movements across the entire National Rail network. Information delivered from Darwin is the customer timetable.

7.2 Darwin Features

7.2.1 Darwin is a complex application that takes in data from more than 65 different system. It uses predictive and heuristic technology to convert that data into useful predictions of train running. Darwin holds the original planned schedules, updated schedules and any new schedules which TOCs may introduce. Darwin logs movements and forecasts received and makes its own forecasts as well as providing a repository for other information NRE generates such as station messages and train alerts.

7.2.2 The following diagram shows existing and developing Darwin feeds and outputs.



7.3 Darwin Information

7.3.1 Darwin information is used in all 'real time' NRE products that are used by the public, train companies, staff and third parties. Display screens at some stations are driven directly from Darwin and the Darwin CIS Programme (one of the Customer Information Strategy Core projects) is underway for all other stations. Online journey planning systems and 'Ticket On Departure' machines use information derived from the Darwin timetable service. Hundreds of licensed third party products display Darwin information and are consistent with NRE. Darwin also stores its information, providing an audit trail, the ability to test accuracy, confidence in the forecasts made and the ability to understand and learn from previous incidents.

7.4 Darwin CIS

7.4.1 In addition to providing real time information to our services, Darwin also provides real time train running information to some stations' Customer Information Systems (CIS); currently those stations operated by Virgin Trains and those operated by Chiltern Railways. There is a national

programme in place which will extend Darwin to feed all of the CIS across the national network, which will be completed in 2015.

7.4.2 Darwin powering CIS is a multi-million pound project to provide additional TOC input to Darwin and ensure Darwin information is displayed on the electronic customer information display screens at stations throughout the UK. Once the project is complete the information on electronic display screens at stations will be more accurate, consistent with display screens at other stations and consistent with the information provided by National Rail Enquiries, including that on nationalrail.co.uk, the NRE App and all NRE telephone and mobile channels. This consistency will provide improved confidence to rail users and will allow TOCs to have much better control of the information given to the travelling public, especially during periods of disruption when duplication of effort will be dramatically reduced, making it possible for TOCs to provide much higher quality information without impacting resource levels.

7.5 **Six Primary Things That Darwin Does:**

7.5.1 **1.Maintains an up-to-date view of passenger train schedules on the UK network for today and tomorrow.** This involves reconciling externally generated schedules and changes. Darwin CIS adds Empty Coaching Stock train schedules to this. Freight and other non-passenger schedules could be included at some point if demand is present. Sources are: Network Rail's ITPS (for daily CIF and "Day A for Day B" updates); Manual TOC operator updates through Customer Information System (CIS) Workstations, Tyrell and the Darwin Workstation, which is also used by NRE's National Rail Communications Centre (NRCC); and, configurably, Network Rail's TRUST schedule cancellations / reinstatements. Darwin does not currently accept Network Rail Very Short Term Plan (VSTP) schedules, although this could be integrated if the data quality improves. Data elements managed by Darwin are: basic train data (e.g. Train Operator, Service ID, status); locations; activities at those locations; public and working scheduled times; cancelled locations; platforms; whether the platform and the train are being shown to the public; associations between trains (including operating associations); cancellation reasons; train alerts; via statements; false destinations; and other information customers want on CIS screens.

7.5.2 **2.Matching externally generated forecasts to schedules.** Darwin matches forecasts received from third parties (including non-specific "delayed" notifications) to the up-to-date list of schedules. Sources of forecasts are: S-Class Train Describer messages which are provided by Network Rail and automatically processed by the CIS; manual TOC operator updates through CIS Workstation and Tyrell; and manual TOC or NRCC updates through Darwin Workstation. Data elements are: Locations; forecast earliest arrival and departure times; forecast non-specific "delays"; platforms; delay reasons; and the expected train order through stations.

7.5.3 **3.Matching externally generated movements to schedules.** Darwin attempts to match all movements (and movement corrections) received from the infrastructure and third parties to a single schedule from the up-to-date list of schedules. Sources of movements are: Network Rail TRUST and C-Class Train Describer messages; manual TOC operator updates through CIS Workstation; manual TOC and NRCC updates through Darwin Workstation. Under Darwin CIS automatically generated movements at specific locations monitored by the CIS will also be provided (mass detectors are fitted in some areas and part of London Underground's TrackerNet will be covered). NRE have been investigating the use of GPS movements with Network Rail for some time but we do not yet have a data feed to integrate. Data elements are: Locations, actual times (or best estimates of actual times if actual times are not known), platforms.

7.5.4 **4.Generating accurate customer-facing forecasts.** This involves taking the up-to-date schedules, the matched external forecasts (including train order and non-specific "delays") and matched

movements (or their absence) and forecasting the times for the activities in the remainder of each schedule. Data elements are: Locations; forecast times; platforms.

7.5.5 **5.Maintaining station messages and train alerts.** Darwin keeps up-to-date lists of station messages (e.g. “Delays of 30 minutes” etc) and train specific alerts (e.g. “Cancelled at York due to flooding”). The source is manual, updates made through the Darwin Workstation by the NRCC.

7.5.6 **6.Publication of Darwin data.** Darwin has several ways of doing this including (but not limited to) the Push Port (which allows clients to replicate portions or all of the database, is used to drive the ticket retailing systems and the NRE journey planner and will be used to drive the CIS); Web Services (which allow clients to send formatted requests and receive responses. The online NRE Live Departure Boards and NRE Mobile Apps both use Darwin Web Services); a number of web applications such as the Live Departure Boards Staff Version (realtime.nationalrail.co.uk/ccldb) – which allows staff to see the data currently being presented to customers, public CIS – which looks like a CIS but is provided as a web page and Darwin history – which shows what Darwin data was being shown at specific points in the past, and can be used as an audit trail to work out why Darwin was showing what it was showing at any time in the last 3 months. Various other interfaces for public and machine use are also supported.