NRE Information Feeds
Developer Pack

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NRE Feeds_Developer Pack v.01-01

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.

Contents

1 Introduction

1.1 Scope of this Document

1.1.1 The scope of this document is to provide developers with a summary of the different information feeds that National Rail Enquiries (NRE) can provide for use in their end user products and systems.

1.2 About NRE Information Feeds

1.2.1 NRE information feeds are derived from three primary engines which also power the NRE website, apps, products and services. These engines are called:

- Knowledgebase
- Darwin
- Online Journey Planner

The feeds are also used by many train companies across their range of customer touch points and the Darwin engine will soon power all in-station screens. Third Party developers also use the feeds across a range of apps, websites, screens, displays and software.

*See Appendix A for more detailed information about Darwin.

1.3 Information Feeds & Products Available:

Knowledgebase	Darwin
Incidents XML (Service Disruption)	Darwin Public CIS (PubCIS)
Incidents XML (Engineering Work)	Darwin Webservice (Public Version)
National Service Indicator (NSI) XML	Darwin Webservice (Staff Version)
Stations XML	Darwin Push Port
Promotions XML	Darwin Timetable Feed
Ticket Types XML	
Train Operating Companies (TOCs) XML	
Stations Made Easy (SME) XML	

Darwin Powered Products	Online Journey Planner
Alerting Engine	Real Time Journey Planning (RTJP) Webservice
Apple Mac Widget	Print Your Own Timetable
Windows Vista Gadget	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.

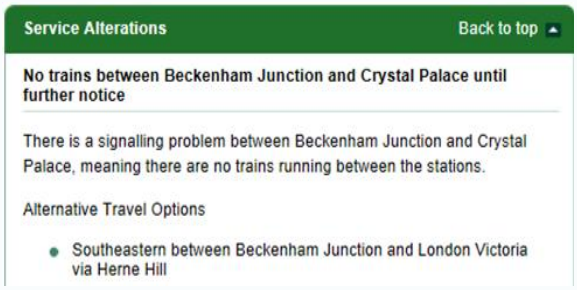
2.2 **Knowledgebase Feeds Available:**

Service Name	Real Time	Available	Terms	Charge Free
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
Promotions XML		✓	NRE Licence	Yes
Ticket Types XML		✓	NRE Licence	Yes
Train Operating Companies (TOCs) XML		✓	NRE Licence	Yes
Stations Made Easy (SME) 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

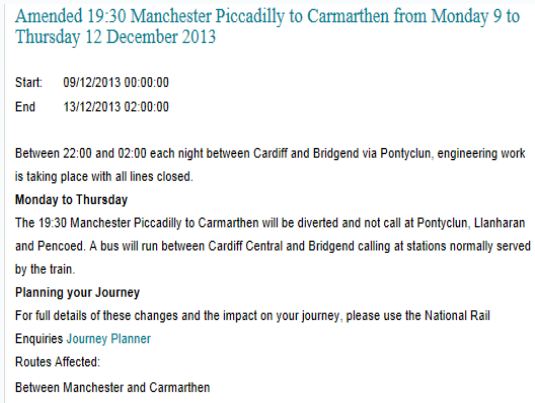


Southern Website

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. 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

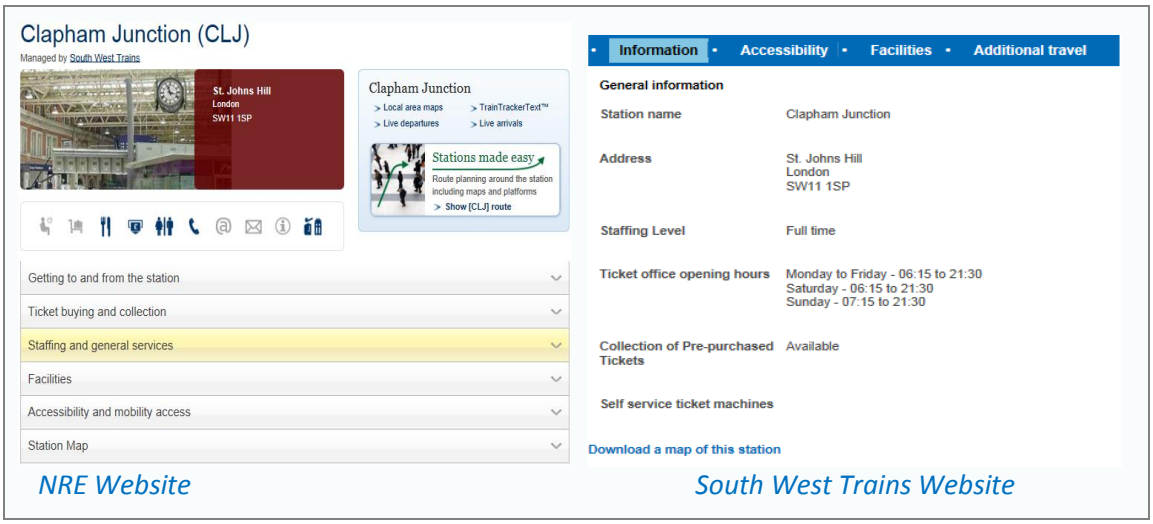
2.5 National Service Indicator XML

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

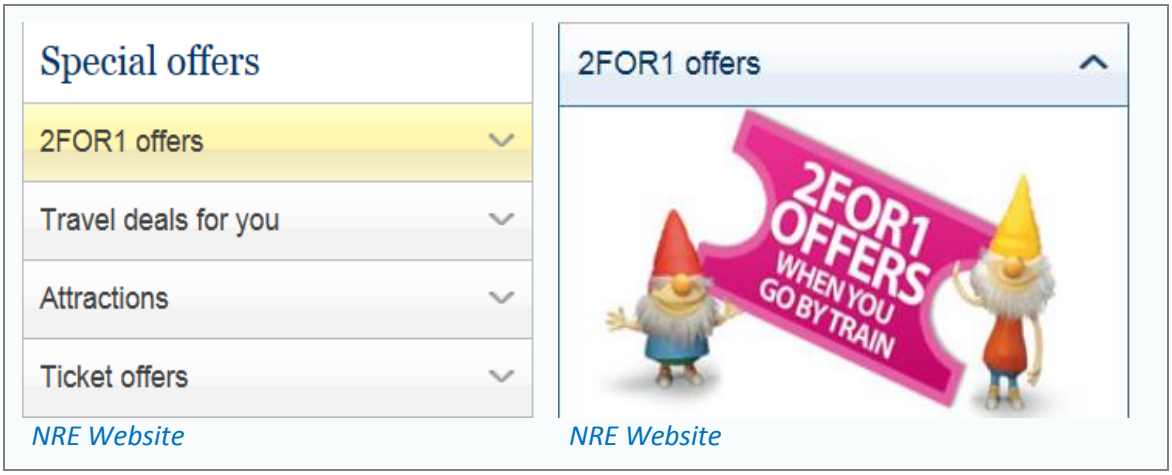
2.6.1 The Stations XML is a knowledgebase feed that contains information about all GB station facilities, including how to get to and from the station, services / amenities available and accessibility. The service can access information about all stations; those for a given TOC or just for a single station. Also available is the Stations Made Easy feed which contains station maps with corresponding accessibility information for each station on the GB rail network.



NRE Website *South West Trains Website*

2.7 Promotions XML

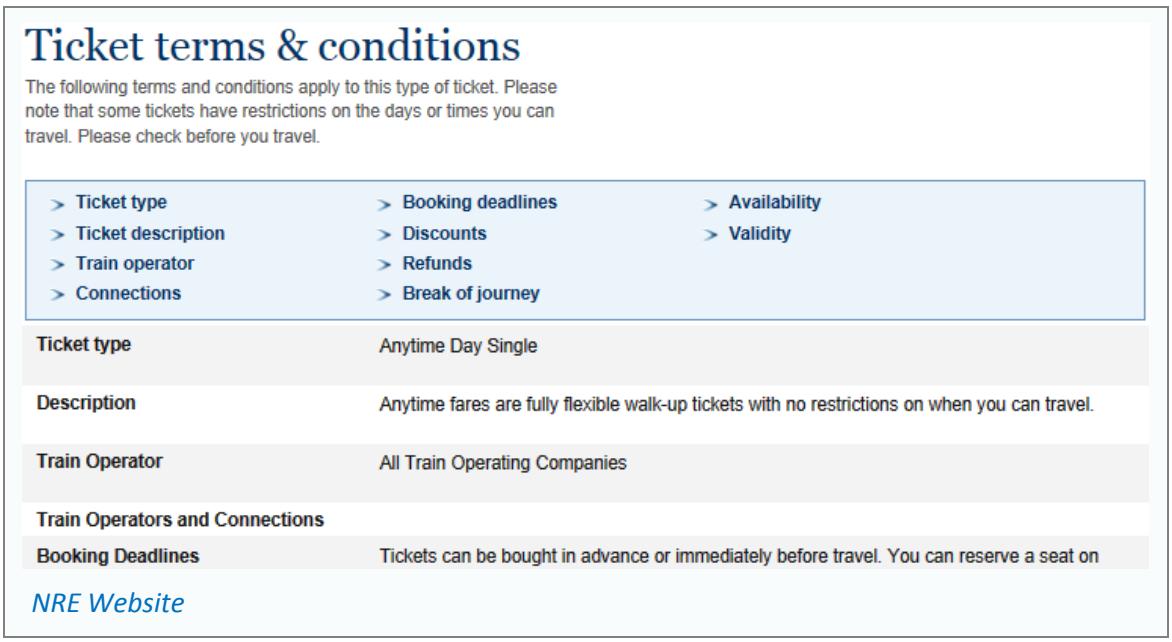
2.7.1 The Promotions XML is an information feed that gives details of ticket and travel promotions being run in conjunction with train ticket sales. It contains information about promotions by other train operators as well as other by 3rd parties and includes information about railcards, PlusBus and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



NRE Website *NRE Website*

2.8 Ticket Types XML

2.8.1 The Ticket Types XML contains information about what ticket types are available. The service allows a user to input their ticket details and returns contextual information about the conditions and validity associated with that ticket.



NRE Website

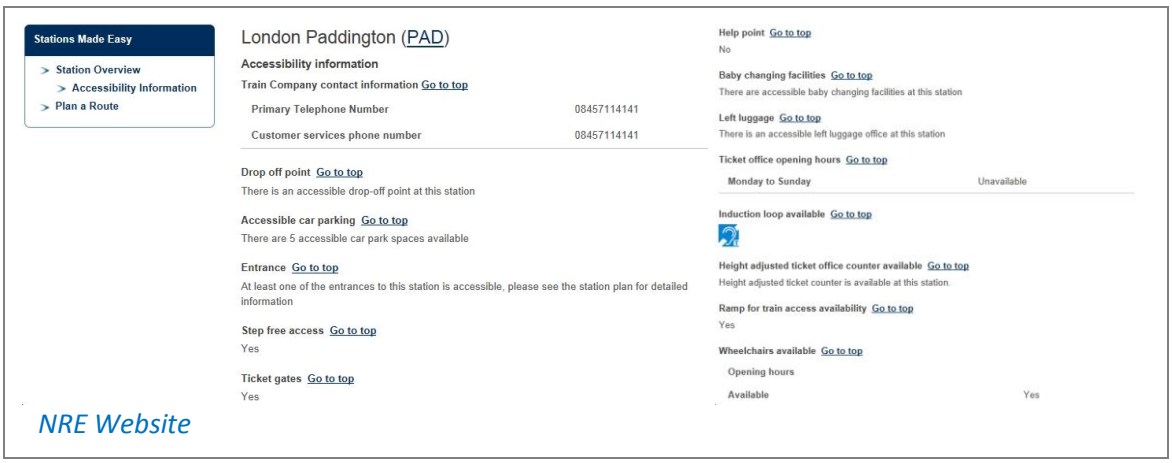
2.9 Train Operating Companies XML

2.9.1 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 *NRE Website*

2.10 Stations Made Easy (SME) XML

2.10.1 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.



NRE Website

3 Darwin Feeds

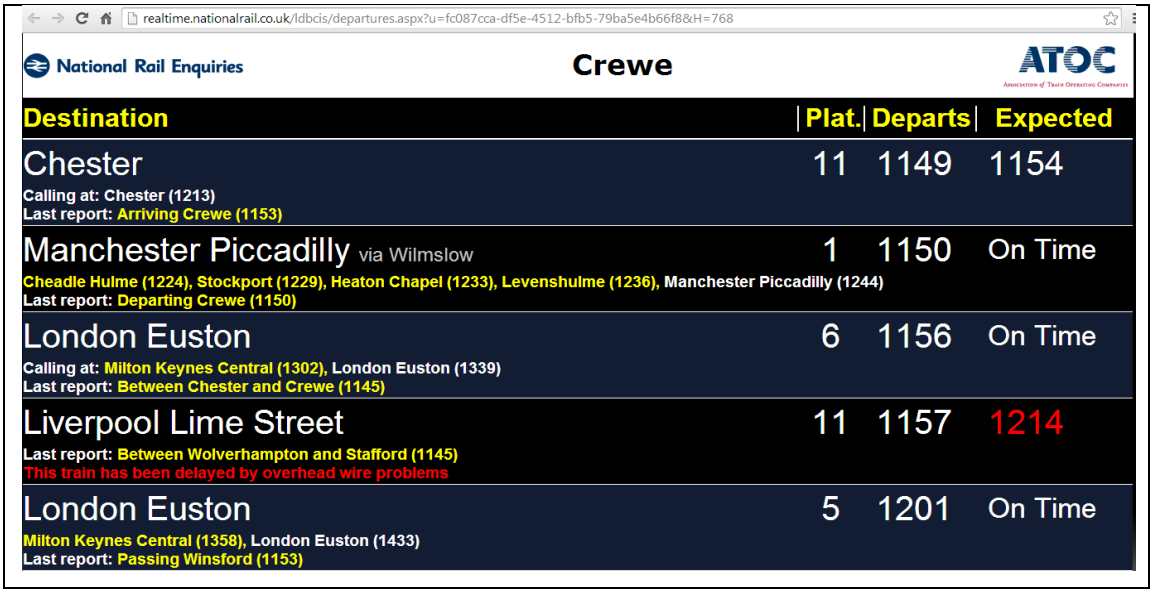
3.1.1 National Rail Enquiries offer a number of feeds which draw information directly from Darwin. Darwin holds the original planned schedules, updated schedules and any new schedules which TOCs may introduce. Darwin logs movements and forecasts received and makes its own forecasts as well as providing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

3.2 Information Feeds Available:

Name	Real Time	Available	Terms	Charge Free
Public CIS (PubCIS)	✓	✓	NRE OGL	Yes
Darwin Webservice (Public Version)	✓	✓	NRE OGL	Yes[i]
Darwin Webservice (Staff Version)	✓	31st Mar-15	NRE OGL	Yes
Darwin Push Port	✓	31st Mar-15	NRE OGL	Yes
Darwin Timetable	✓	31st Mar-15	NRE OGL	Yes

3.3 Public CIS (PubCIS)

3.3.1 Public CIS is a webpage made available through a simple URL that provides CIS style live departures or arrivals information for display on digital screens only. It is fully 'mobile' and can be presented anywhere that there is an internet connection and a screen that can be linked to a server. We can also 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 that it will take some time to get to.



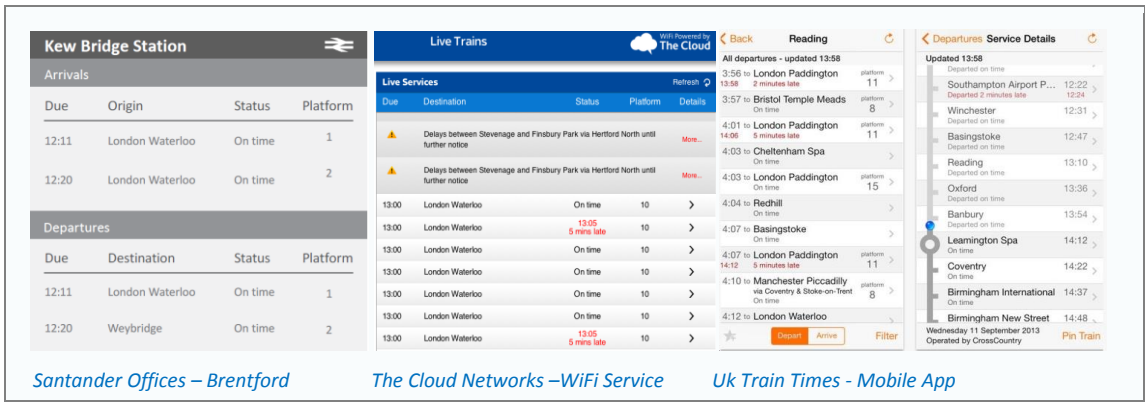
3.4 Darwin (LDB) Webservice (Public Version)

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 not currently available to developers due to the technical limitations of our system. Changes are being made to enable access which we plan to deliver by the 31st of March 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

3.6.3 **Additional Notes:**

The Darwin Push Port is vast, requiring a great deal of interpretation and coding and if incorrectly used it could cause a system failure. As such The Darwin Push Port is not currently available for use by third parties due to the technical limitations of the system architecture. A new resilient infrastructure is planned to be delivered by the 31st of March 2015 which will enable users to have full access to the feed via web link.

3.6.4 ***PLEASE NOTE**: These stipulations are in place in order to protect our system from failing through misuse whether intentional or unintentional. This is non-negotiable, at least until the new infrastructure is delivered.

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

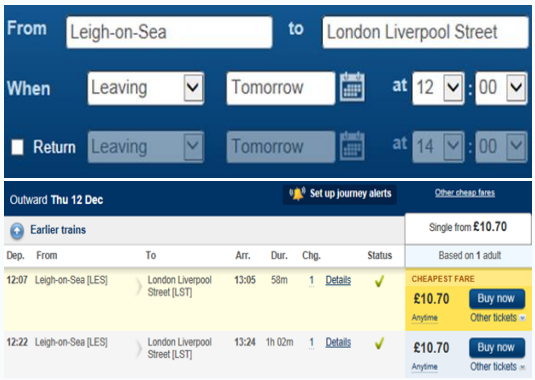
4.1.1 The Online Journey Planner (OJP) is a software tool that uses a combination of timetabled information, live train running information from Darwin, customer location and ticket pricing to deliver a variety of journey planning services tailored to the customer's specific needs. The online journey 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:

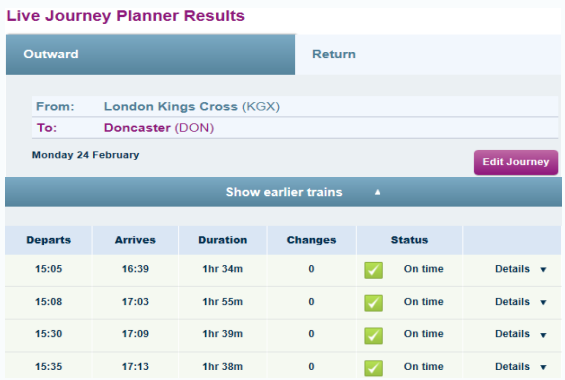
Name	Real Time	Available	Terms	Charge Free
Real Time Journey Planner Webservice	✓	✓	NRE Licence	No
Season Ticket Calculator		✓	NRE Licence	No
Print Your Own Pocket Timetable		✓	NRE Licence	No

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



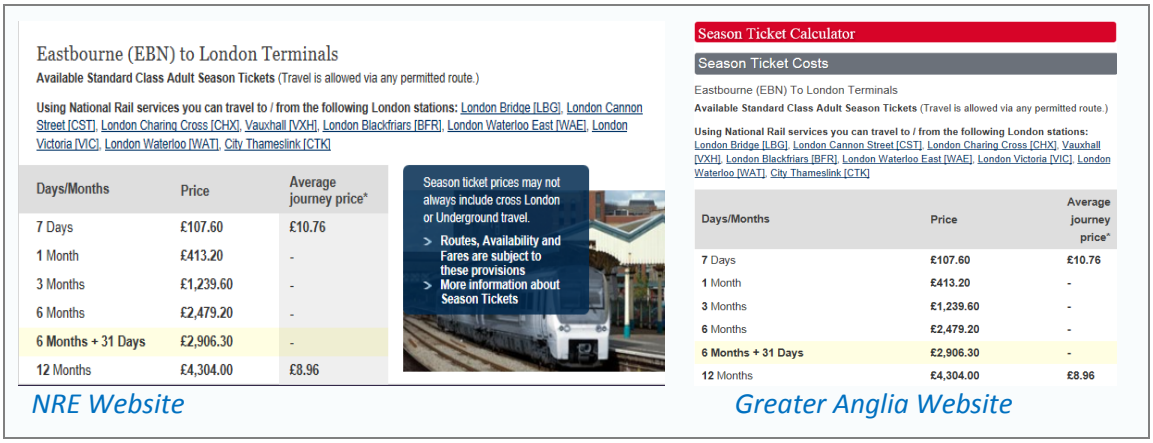
East Coast Train Website

Recommended Uses:

Mobile Apps | Websites | Touch Screens Displays

4.4 Season Ticket Calculator

4.4.1 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.



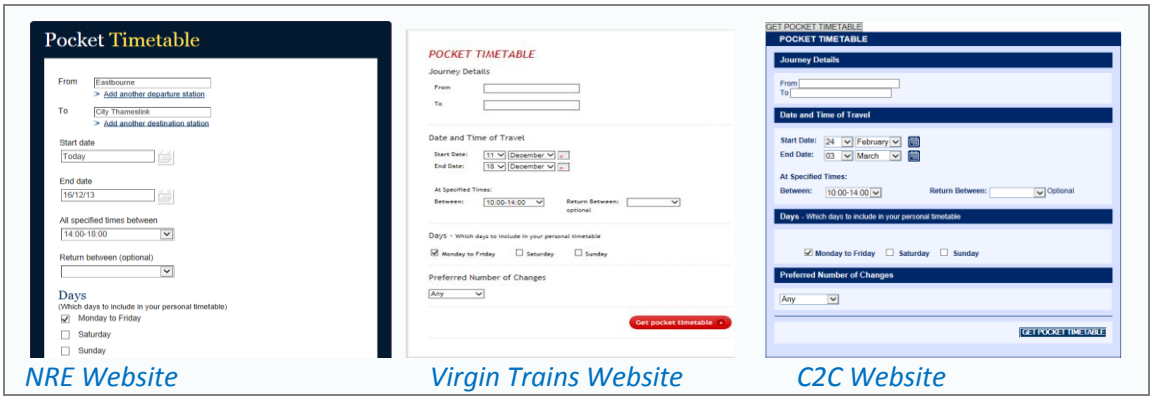
NRE Website *Greater Anglia Website*

Recommended Uses:

Mobile Apps | Websites | Touch Screens Displays

4.5 Print Your Own Pocket Timetable

4.5.1 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 Darwin Powered Products

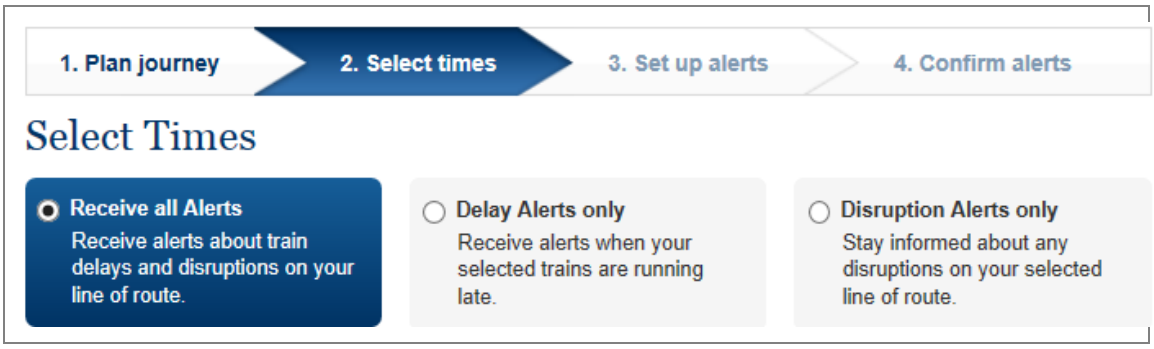
5.1.1 National Rail Enquiries have developed a number of Darwin powered applications to support the provision of information to customers. Each product is real-time, using live train running information directly from Darwin.

5.2 **Products Available:**

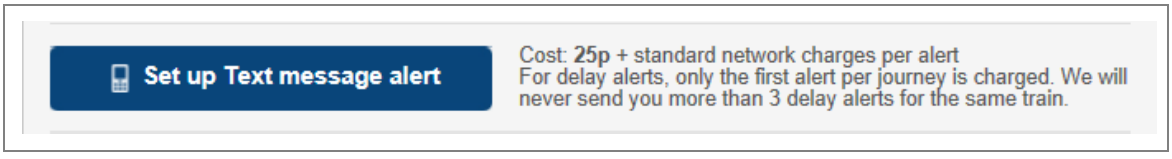
Name	Real Time	Available	Terms	Charge Free
Alerting Engine	✓	✓	NRE Licence	No
Apple Mac Widget	✓	✓	NRE Licence	Yes
Windows Vista Gadget	✓	✓	NRE Licence	Yes

5.3 **Alerting Engine**

5.3.1 The NRE alerting engine is a web based solution to informing passengers of delays or cancellations on specific trains or routes. The service is linked directly to Darwin's real-time database and allows customers to choose the trains they wish to be updated about by selecting a few simple options. It is available as an NRE product displayed on your channel, or as a white-label service with your colours and branding for an additional fee.

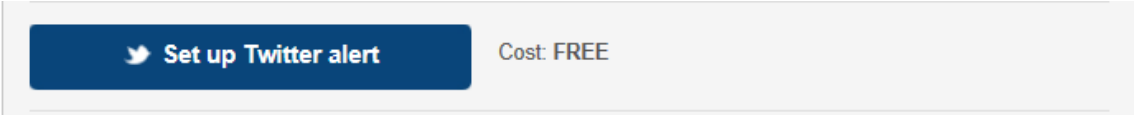


5.3.2 **SMS Disruption Alerts:** Generate text message alerts to the customer's mobile phone or device. If any part of the user's journey is broken, an alert will be generated. Ad-hoc alerts can also be generated via Darwin Workstation. The service is user preference driven, meaning alerts can be set up for regular or one-off journeys. Text messages generated come at a cost to the customer of 25 pence per message (ppm), with 5 ppm being credited back to the user.



5.3.3 **E-mail Disruption Alerts:** Generate e-mail alerts to a customer's designated account. If delays or cancellations are reported on any part of the users' journey, an alert will be generated. The service is user preference driven, so alerts can be set up for regular or one-off journeys.

5.3.4 **Twitter Disruption Alerts:** Direct messaging to a customer's Twitter account. Through the alerting engine a customer can sign up for direct message alerts about disruption for any particular train service. Customers simply identify the parameters regarding the services they wish to be informed about, then in the event of information being published on one or more of those services, customers will receive a message sent directly to their Twitter inbox.



5.4 Windows Vista Gadget

This service is a simple gadget offering Vista styled live departure and arrival information that is personalised to suit the user. It allows users to alternate between arrivals and departures as well as between location dependent on time of day and other user preferences. The gadget also provides a link to further information via the NRE website when there is disruption. The Windows Vista Gadget can be offered with NRE branding or your branding for an additional fee.

5.5 Apple Mac Widget

Similarly to the Vista Gadget, this service offers live departure and arrival information that is personalised to suit the user. It allows users to alternate between arrivals and departures as well as between location dependent on time of day and other user preferences. It also provides a link to further information via the NRE website when there is disruption. The Apple Mac Widget can be offered with either NRE branding or your branding for an additional fee.

6 Services In Development

6.1.1 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.

6.2 Services Pending

Service Name	Real Time	Available
Disruptions Webservice	✓	Pending
Station Information Webservice		Pending
Cycling Restrictions Webservice		Pending

6.3 Disruptions Webservice

Through this service the Online Journey Planner consolidates the four different sources of disruption information into a single service. When making a request to the service by specifying the station information and departure time, the enquiry will return an answer regarding any and all the disruptions affecting that line of route at the given time. The service is updated manually by the NRCC, but in real time.

6.4 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 2014.

6.5 Cycling Restrictions Webservice

This service would use a request based API 'request and respond' webservice to deliver cycling restriction information for any user specified train journey. This service is not currently scoped, but is an option in the event that there is demand for the service from the TOCs

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7 Contact Us

7.1 Service Licence Requests

7.1.1 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

8 Appendix A

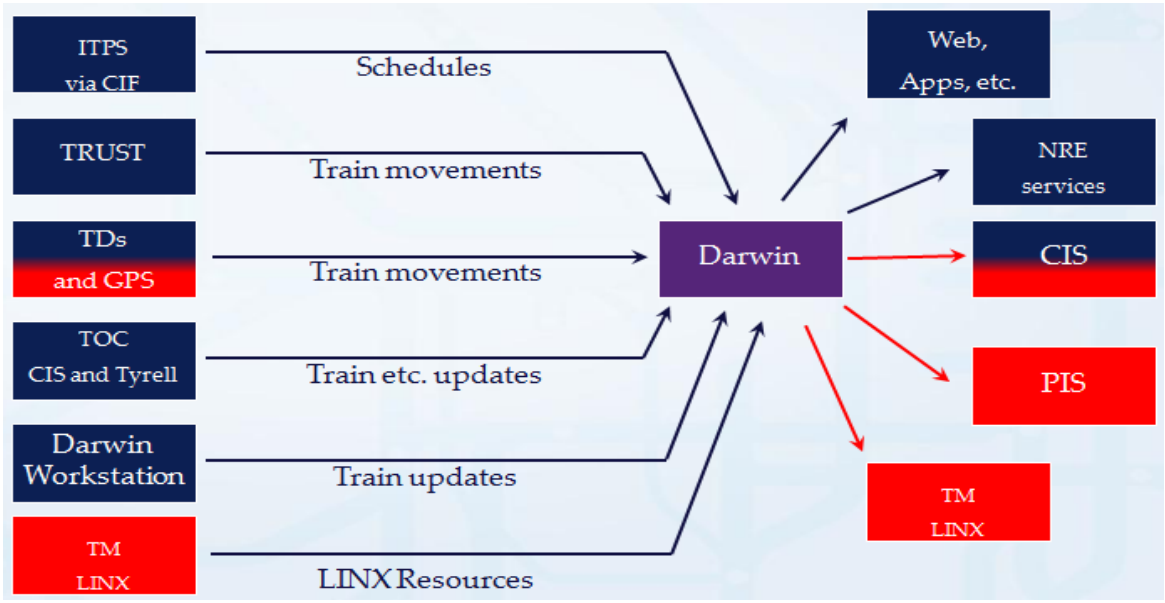
8.1 Darwin Overview

8.1.1 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.

8.2 Darwin Features

8.2.1 Darwin is a complex application that takes in data from a wide range of sources then 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.

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



8.3 Darwin Information

8.3.1 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.

8.4 **Darwin CIS**

8.4.1 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 by April 2015.

8.4.2 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.

8.4.3 For more information about Darwin CIS, contact the Darwin CIS programme Manager at David.Johnson@atoc.org

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

8.5.1 **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.

8.5.2 **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.

8.5.3 **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.

8.5.4 **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.

8.5.5 **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.

8.5.6 **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.

[i] Usage of Darwin feeds is free subject to high volume usage charges which are specified in the NRE High Volume Usage Document.