

# NETWORK RAIL: MANAGING RAILWAY RECORDS IN THE TWENTY FIRST CENTURY

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## **Introduction**

Network Rail runs, operates, maintains and invests in Britain's rail network. In 2010 this consists of 20,000 miles of track and infrastructure, 40,000 bridges and tunnels, 18 major stations, 2,500 other stations (leased to train operators) and 8,200 commercial properties. Britain has the fastest growing railway in Europe and passenger miles are greater now than they ever have been in the last 60 years on a network that is roughly half the size.

The railway has historically created large quantities of records, and the operation and development of the railway infrastructure in the twenty first century is no exception. The record collections that Network Rail manage date from the very earliest days of railway construction; bridges, tunnels and stations designed and built by the nineteenth century's most dynamic and innovative engineers are still very much part of today's operational railway. Every day the company is also creating records and managing data that uses and develops cutting edge engineering technology to develop and maintain the modern railway.

This article aims to give its reader an appreciation of the scale of records management currently being undertaken to support today's railway infrastructure, and how the Network Rail corporate archive, as a relatively new service for the business, is forming part of this records management activity.

## **Background**

The National Records Group is Network Rail's centre of excellence for records management. It controls and manages asset related records regarding the railway infrastructure as well as the Network Rail registry of deeds, corporate library, off-site storage service and corporate archive. The National Records Group also provides advice and consultancy on all aspects of records management to the company. All processes are audited by the British Standards Institute and the service is ISO9001:2008

accredited. National Records Group was also the Records Management Society 'Records Management Team of the Year' in 2009<sup>1</sup>.

Customers of National Records Group services are mainly Network Rail project managers and engineers across all disciplines (signalling, track, civil engineering, maintenance) as well as external design houses who undertake changes to the infrastructure on the company's behalf. The group also provides property information to Network Rail legal, property and liabilities teams, and work with those who interface with the railway, for example; utility companies who deliver services using railway property, British Transport Police who provide specialist policing for a safe and secure railway, and London Transport who interface with mainline railway stations in the capital.

The safe operation of the railway infrastructure relies on Network Rail company standards to inform working practices at every level of the organisation; compliance with Network Rail standards is mandatory across the company. In 2009 and 2010 a suite of ten records management standards were published which together form a set of rules by which the company will manage its recorded information. This suite of standards includes policies on metadata, information security, information sharing, retention, disposal, and media conversion as well as policies on records management and the corporate archive<sup>2</sup>.

### **Moving to a national records management service**

Until June 2008 Network Rail operated 11 regional record offices, each typically with six or seven members of staff. These offices had grown up through a long history of fiercely proud railway companies, the regions of British Railway, the zones of Railtrack to the routes of Network Rail. Each regional office had its own referencing systems, catalogues, indexes and procedures, and as a consequence the service to customers could be confusing and inefficient at times of high demand. These offices also had a variety of issues ranging from inadequate record storage environments to expiring leases.

In order to meet the challenges of delivering a twenty first century railway and realise the maximum efficiencies and benefits from having a single point of contact for asset related records, the decision was taken to consolidate these 11 regional centres into one national centre. This would enable Network Rail to:

- establish a single, consistent way of working
- provide a single location for infrastructure records which is safe, secure

and managed to the highest standards

- establish a single team with a mix of specialist skills
- manage Network Rail's infrastructure records over the full records lifecycle

Work on streamlining records management processes and standards at a national centre would also enable Network Rail to deliver better value by:

- working towards a fully integrated content management system for infrastructure related records
- developing an ongoing scanning and cataloguing programme, enabling us to offer customers better self-service access to infrastructure records
- moving from being a reactive to a proactive records service, by increased engagement with customers and improved forecasting of their requirements

A suitable location for the national record centre was found in July 2007; a 55,000 square foot warehouse in the north of England. Over the next eight months the building was refurbished to create open plan office accommodation for 60 people, meeting rooms and storage areas with state of the art fire and security systems conforming to BS:5454. With a total of 11.5km of shelving space installed, there was enough room for the entire collection of infrastructure records to be moved directly from regional offices to the new store.

The physical movement of records began in April 2008 on a record centre by record centre basis. Over the next six months a total of 216 lorries were received (equivalent to 3,890 tonnes of records), travelling 83,632 miles over 76 working days. This is in excess of seven million paper records that if stacked would reach 13.5 times the height of the Eiffel Tower, or just short of the Matterhorn. At the same time there was an intensive period of recruitment and training for new record centre staff as well as knowledge transfer from the regional offices that were being closed.

The move to the new national records centre has enabled the National Records Group to implement changes to the core services which has made them more streamlined, in particular enabling the teams to move from a territory based service to one that is process led. It has also enabled the National Records Group to focus much more on embedding records management principles into every service it offers and has facilitated the establishment of new services for the business.

## **National Records Group Services**

***Records management advice & consultancy:*** The National Records Group has a number of experienced information professionals on the team who provide records management expertise across all business functions. The advice and consultancy programme is wide ranging and includes writing and promoting records management company standards, publishing guidance to help support these standards, advising large scale office movements, presenting records management road shows in major Network Rail offices around the country, and providing support to all parts of business in relation to the development and use of record systems.

***Asset related records management:*** The National Records Group manages asset related records and acts as the custodian for these records collections. For the signalling discipline, the National Records Group manages 1.2 million records and 500,000 signalling records are booked out and returned by engineering projects each year. The role of the National Records Group is to provide the management processes around metadata and version control to ensure all changes to signalling assets are recorded and that no two projects are working on the same drawing at any one time. Whilst the majority of these signalling records are now in an electronic format, there are also considerable amounts of hard copy. If changes alter the signalling assets significantly then the design records are converted into CAD format and this becomes the ongoing medium of change. If the drawing is in hard copy and only minor changes are being made, the changes are still reflected using pen and ink on the original negative paper.

For the civil engineering discipline, the National Records Group manages over 3.5 million engineering drawings, receiving over 19,000 enquiries and issuing over 186,000 copy drawings to customers per year. While the version control in civil engineering records is not as business critical as that for signalling records (unlike signalling assets, the basic structure of assets such as tunnels, bridges and stations do not change much over time), a full picture of the history of civil engineering assets is important. In order to keep this history up to date the civil engineering record teams are provided with health and safety files at the end of every civil engineering project. These files contain the 'as built' drawings for any changes relating to a structure. The engineering drawings are taken from the health and safety file, scanned, catalogued and uploaded into

Network Rail's content management system so that they are available for ongoing maintenance and for future projects to access. The civil engineering records teams also provide safety critical information relating to buried services (the location of electricity cables, gas, water and drainage pipes running on the infrastructure) to Network Rail engineers.

***Signalling data management:*** The National Records Group acts as custodians for several electronic signalling systems. Operating either alongside or in the place of traditional signalling systems, they are responsible for a large variety of safety critical actions, from route-setting, to tilting trains, to signal operation. This data covers the length and breadth of the country and the National Records Group is the custodian of this data. The data management team also supply unique identities for transmission over the Fixed Telecoms Network to enable safe communication between all these systems. As lines are renewed and upgraded, the scope of the data systems held by the National Records Group will increase in turn, moving to include in-cab signalling systems as used across Europe. The work the data management team undertake is vital to maintaining the integrity of this data which carries the highest safety level, so it is therefore of paramount importance that its configuration and application is 100 per cent accurate at all times.

***Property deeds:*** Network Rail has a large property portfolio; the company operates its own registry which forms the legal title to the railway estate, holding in excess of three million hard copy deeds and other property related documentation including sales conveyances, Scottish dispositions, leases, grants, way leaves, licences and deeds of easement, station and depot leases and bridge maintenance agreements. Network Rail has a responsibility to manage the railway estate and maximise the revenue stream from that estate. This is achieved in a number of ways; developing available railway assets (for example, the redevelopment of major stations), the sale of non-operational railway land, the purchase of land to enhance the operational railway and the rental of appropriate land and space on the railway estate (for example units in railway arches, retail outlets at major stations). Records in the deeds registry support all this activity. The deeds registry is also used to establish boundaries, responsibilities and rights of access relating to the railway estate. Original property deeds are loaned on a regular basis to

the company's legal and liability teams as well as to solicitors undertaking work on Network Rail's behalf. The deed packets date from the start of railway construction, but the deeds themselves date back to the mid sixteenth century; seals and signatures include those of royalty, the aristocracy, prime ministers and other notable characters from history who once owned land sold to the railway developers.

***Business support for content management systems:*** The National Records Group provides business support for a number of content management systems that are in use within the company. The team processes over 400 support enquires per week from customers both internal and external to Network Rail, and covers approximately 10,000 active users. The support activities can be separated into three main categories: system administration and user account management (new accounts, new folders, user permission setting etc), content management and information governance (establishing lifecycle rules, checking data quality) and user support and training (answering 'how to' questions, creation of user guides and advice on best practice). The support team allow both the National Records Group and its customers to work more efficiently by leading on technical and process improvements, facilitating greater levels of self service and ensuring that records management standards are applied in the use of document management systems.

***Media conversion:*** Similar to other major companies there remain sizeable record collections which are being converted into electronic format. The National Records Group takes the lead in large scale media conversion projects to ensure they offer the business value for money, that they take place in accordance with the Network Rail scanning standard and that the correct cataloguing, file formats and image resolutions are used and consistently applied. The National Records Group also advises on the disposal of hard copy material once a scanning project has been completed.

***Off-site storage:*** Network Rail holds a high volume of hard copy records in its off-site storage facility. New processes for sending records off-site have improved the information governance of this hard copy collection significantly. Full inventories and accurate retention dates in line with the corporate records retention schedule are required before any new

material is accepted for storage. Questions are asked about whether records are held electronically; if the records exist in electronic format, hard copy will not be accepted for retention without a business case for doing so. It is also asked if it would be appropriate to scan the records and hold them electronically instead; if it is, the National Records Group will help facilitate a scanning project or assist with setting up a process to enable scanning to take place on an ongoing 'business as usual' basis in accordance with the Network Rail records management standards. There is also an ongoing project to evaluate legacy records held in off-site storage. Appraisal of the records is carried out against the corporate records retention schedule; records that are time expired are confidentially destroyed, records that require further storage are fully catalogued, assigned ownership and retention information and resubmitted. Records that are to be retained permanently or which have historical significance are sent to the corporate archive.

***The corporate library:*** The corporate library holds a large and expanding collection of books relating to railway engineering disciplines as well as core texts for Network Rail's management and leadership courses. It also manages company wide subscriptions to engineering journals and professional societies. Network Rail relies on a number of both company and industry wide standards both of which are published by the British Standards Institute; the corporate library manages the company's subscription to British Standards Online which is available to employees.

***Document control:*** Controlled documents in this context relate to safety related information that is distributed within Network Rail to individuals (for example, the Rule Book); a signed acknowledgement is required to be returned to the document control officer as confirmation that the individual has received their copy. The National Records Group manages the distribution of controlled documents to colleagues in the Investment Projects and Safety and Compliance functions.

***Records liaison:*** The National Records Group has two records liaison managers who act as an interface between the engineering project environment and the National Records Centre. Network Rail undertakes multi million pound projects, all of which will require access to large

numbers of asset related records. These projects (such as Thameslink, Crossrail, and Birmingham Gateway) will then generate thousands of new and/or altered records that will be handed back from the project to the National Records Group to allow maintenance and future projects to utilise the information. Because of the high volume of records it is crucial that the National Records Group are aware of record requests and return timelines; the liaison managers facilitate this forecasting process. The records liaison managers work with project teams and external design houses to help them incorporate all Network Rail records management standards and National Records Group processes into their project management. They also undertake audits in order to reinforce those standards.

### **The corporate archive**

Establishing the national records centre has enabled Network Rail to create for the first time a corporate archive. The decision to create a corporate archive was driven by a need for the company to manage a permanent collection of records. A qualified archivist was recruited to lead the establishment of the archive, to develop archival policies and standards for the company and oversee the implementation of those policies over time. There was also an appreciation that the records Network Rail wished to keep permanently would be of interest to external stakeholders. The work that Network Rail undertakes to maintain and develop today's railway infrastructure is a continuation of the history of Britain's railways and this will, in time, be of use to historians. It would also bring Network Rail in line with other industries with a proud heritage that operate their own corporate archives.

In setting up the archive it quickly became apparent that there were two distinct elements to what it would aim to achieve; the creation of a modern business archive for Network Rail, alongside a historical collection which represents the company's engineering inheritance. The corporate archive policy states that it will collect;

- records relating to the corporate governance and functions of Network Rail Infrastructure Ltd (including the period of Railtrack plc)
- records relating to the operational railway infrastructure which are of significant historical merit, achievement or status
- records relating to the creation and development of the railway infrastructure

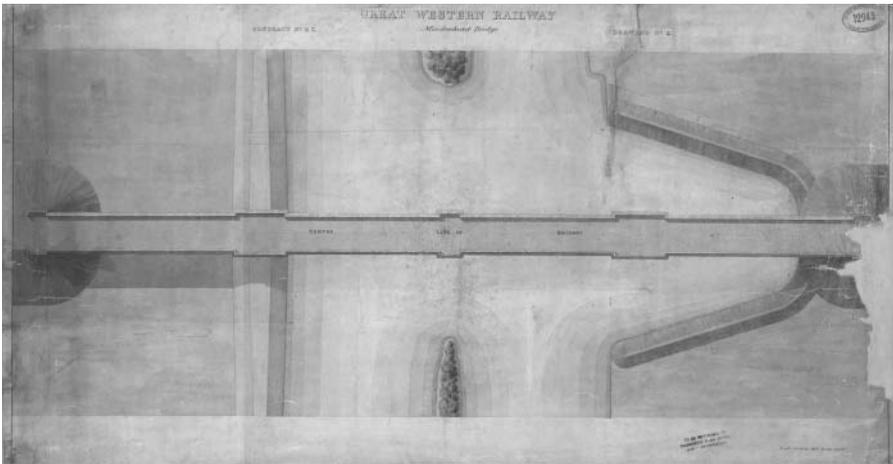
Almost as important as what the corporate archive would collect was a statement about what it would not collect. Items that would not find

their way into the corporate archive include:

- records that do not belong to Network Rail under the Transfer Agreement of 1994 and which are the property of British Railways Board (Residuary) Ltd
- records relating to rolling stock not owned by Network Rail
- records relating to structures no longer part of the operational railway and for which Network Rail has no ongoing liability

***A business archive for Network Rail:*** The formation of a permanent archive for Network Rail which reflects the modern, post privatisation management and development of the railway is challenging in a relatively young company. Once the broad collecting policy was established, the first task was to identify within those criteria what the company would wish to have in the archive. It was extremely fortunate that work was already taking place on developing a corporate records retention schedule. Embedding the collecting policy within this schedule enabled the corporate archive from the outset to become a key part of the records management process within Network Rail. The analysis of company functions in order to create the corporate records retention schedule immediately identified records that are to be kept permanently as a result of legislation and regulation; board minutes, annual reports and accounts and so on, which form the basis of any business archive. However this analysis also provided an opportunity for the corporate archive to identify other business records it would wish to keep permanently. In the published schedule, records which must be kept permanently are flagged with specific instruction to contact the archivist. These records can then be added to the catalogue and deposited directly with the corporate archive. Other records are flagged as being of interest; again there is specific instruction to contact the archivist after the appropriate retention period has elapsed and arrangements can be made for the appraisal of the material for inclusion. As a precaution, all hard copy records held off-site are appraised by the corporate archive before any destruction takes place.

Raising the profile of the corporate archive within the business through online forums, intranet pages and its incorporation into records management road shows delivered throughout the business, has also encouraged colleagues to get in touch when they have records they think may be historically important. The modern business archive for Network Rail continues to gather momentum in these ways.



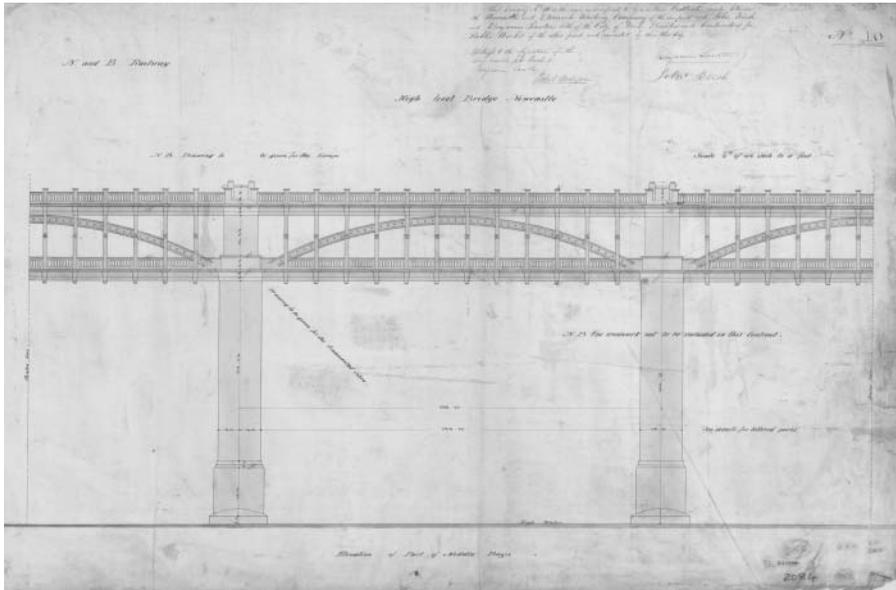
*Drawing showing the Maidenhead Bridge crossing the River Thames, designed by Isambard Kingdom Brunel. The bridge was opened in 1839*

© Network Rail, National Records Group

***Engineering inheritance collection***: In the corporate archive policy the remit of the engineering inheritance collection is to collect records that have been in the ownership of the privatised railway which relate to: significant structures, achievements, projects and events relating to the development of the operational railway infrastructure, the creation and development of significant operational routes and work carried out by significant engineers in the creation and development of the operational railway infrastructure.

Interest in the Great Western Railway, the railway companies in which it was involved and of course Isambard Kingdom Brunel, was always evident at the old Swindon record centre. Over many years, Brunel era drawings were identified within the main collection of civil engineering drawings at Swindon, conserved and then held separately from the rest as a historical collection. As a result the corporate archive inherited some 3,000 drawings which have formed the basis of the engineering inheritance collection. This collection includes original engineering drawings for many of the gems on the railway infrastructure including those for Brunel's Maidenhead Bridge over the river Thames (opened in 1839 it has two semi elliptical arches, at the time the widest and proportionately lowest arches ever built), Box Tunnel outside Bath (opened in 1841 it was at the time the longest railway tunnel in the world), and the Royal Albert Bridge at Saltash (built for the Cornwall Railway and opened in 1859, it has a unique bowstring suspension bridge design).

Any appreciation of nineteenth century history will show that while his achievements were many and great, Isambard Kingdom Brunel was not the only engineer who built the railway. So, an early effort was made to identify other significant engineers and significant structures relating to the railway infrastructure, whose drawings might merit a place alongside those of Brunel in the archive. This has so far included the addition of drawings relating to Stephenson's High Level Bridge at Newcastle, Royal Border Bridge at Berwick, and Britannia Bridge in North Wales as well as the twentieth century 'Span 4' roof extension at Paddington Station.



*Drawing of the High Level Bridge, designed by Robert Stephenson for the Newcastle and Berwick Railway. The bridge was officially opened in 1849.*

© Network Rail, National Records Group

In establishing the corporate archive, there have been some challenges in developing this historical collection. Over the years as the organisational structure of the railway has changed, been nationalised and modernised and returned once more to the private sector, records have been dispersed and in some cases, destroyed. In the 1960s in particular as lines closed, stations were being rebuilt and the move towards modernisation began, British Railways undertook significant microfilming projects, resulting in large quantities of original records being either given away or simply destroyed. Records relating to the operational railway are now to be found in other

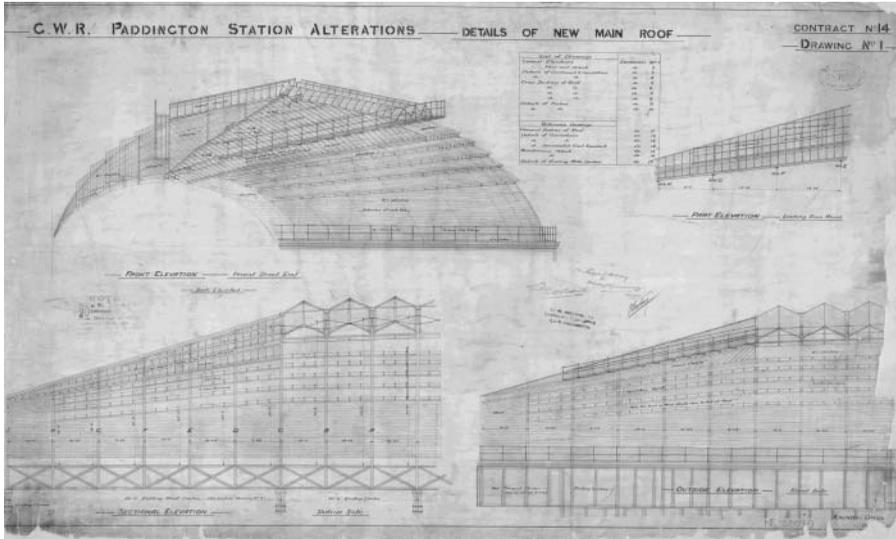
record offices, museums and heritage organisations across the country. In some cases the railway record has been split between Network Rail and another organisation; for example in the Network Rail corporate archive there are original contract drawings for cuttings and embankments designed by I.K. Brunel for the Great Western Railway, however the contract documentation that it relates to can be found in The National Archives at Kew. Old timetables and operating information that may provide further understanding to an engineering or maintenance project today can be found at the National Railway Museum's Search Engine library and archive centre. It is important therefore that the corporate archive builds relationships with these railway record holding organisations so that if there is information held elsewhere that might help inform the work the company undertakes, it can still be accessed and used.

A significant part of the corporate archive budget relates to conservation of historical items. Drawings are first identified and located in the main civil engineering drawing collections, then sent for full conservation treatment. After conservation the drawings are digitally photographed for reference, encapsulated for protection and then stored in the corporate archive room at the national records centre. The conservation programme concentrates on items recently identified for the corporate archive; however it has also enabled a number of the most significant drawings to be re-conserved using modern techniques. This has significantly improved the condition of the drawings and the quality of the digital images.

### **The corporate archive supporting the business**

Once the corporate archive was created it had to start earning its keep within the business. From the outset the corporate archive has been a resource for Network Rail, focusing on the internal operational requirements of delivering a safe and efficient railway. Although there is a great deal of interest in Network Rail's records from many different audiences, there is no provision for access to records for members of the public. However, the corporate archive does work with external stakeholders in support of activities directly relating to the railway infrastructure where it is appropriate to do so.

In supporting the company's internal requirements for example, the corporate archive works extensively with colleagues in town planning providing historical information required for submitting listed building consents. As a large proportion of the structures on the railway network are



*Drawing showing the designs for the 'Span 4' roof, constructed as part of the enlargement of Paddington Station and added between 1911 and 1916.*

© Network Rail, National Records Group

listed, any work on those structures involves the approval of English Heritage before it can take place.

The corporate archive works in line with the business in the identification of historical information which will support high profile projects that the company undertakes. For example, Network Rail has recently undertaken a £35 million project to restore 'Span 4' at Paddington Station, an Edwardian extension to the station roof covering platforms nine to 12 and completed in 1916. For many years the roof was covered by a false ceiling in order to protect the public from glass in a roof that had fallen into disrepair. Not only does the 'Span 4' project draw to a close the restoration of the entire roof at Paddington Station, it also complements other improvements being made to the passenger facilities at the station and changes being made as part of the Crossrail project. In anticipation of the 'Span 4' project starting in January 2009, the corporate archive identified in the main civil engineering collection the original contract engineering drawings for the roof extension. They proved to be the complete set of drawings, albeit in a poor condition. The corporate archive commissioned full conservation treatment for the drawings which were then digitally

photographed. The digital photographs were then handed to colleagues in Government and Corporate Affairs who could incorporate the images into publicity and exhibitions around the project. Similar work was undertaken on two nineteenth century photograph albums that documented the



*Photograph showing the new Tay Viaduct during construction, next to the remains of the original viaduct which collapsed during severe gales on 28 December 1879. Photograph dated 3<sup>rd</sup> May 1886.*

© Network Rail, National Records Group

construction of the new Tay Bridge in Scotland (the longest bridge on the railway infrastructure), as Network Rail announced a £20 million restoration project.

In supporting Network Rail's external stakeholders, the corporate archive works a great deal with archaeologists who have been commissioned to undertake digs and building recording where work on the railway infrastructure is taking place. This has included providing information to archaeologists who have been working on the building recording of Brunel's structures at Paddington station and the great western mainline prior to changes made to those structures as part of the Crossrail project. The corporate archive has also provided historical engineering information to architectural historians and archaeologists working on the redevelopment of King's Cross station and the surrounding area

The archive also supports the heritage element of Network Rail's corporate responsibility programme<sup>3</sup> by supplying historical information to the Railway Heritage Trust in order for them to develop and give advice to projects which conserve and enhance railway buildings of special or historical interest. It also works with the railway heritage committee to help protect assets belonging to Network Rail that have been designated by the committee as having special significance to the history of the railway. In relation to the corporate archive this includes specific engineering drawings connected to George Stephenson, Joseph Locke and the Sankey Viaduct on the Liverpool and Manchester Railway. On the operational railway it includes artefacts ranging from clocks and signage to stained glass windows and signalling installations. The corporate archive has led a project to identify and plot on the company's geographic information system all those railway heritage committee designated items relating to Network Rail that are physically on the infrastructure so that when work is being planned their presence is highlighted.

### **Looking towards the digital future**

Perhaps the biggest challenge facing the National Records Group, and in particular the corporate archive, is that of digital preservation. Network Rail is ever more reliant on digital information to carry out its day to day activities; increased use of content management systems, collaboration tools, online publishing and media conversion all contribute to the company's growing digital business.

Network Rail has to take the long term view with regards to recorded information; many of the record types relating to the railway infrastructure must be kept for the life of the asset. Some of these structures and the drawings that relate to them are already over 180 years old; potentially the digital information being created in connection to them must be managed and maintained for similar periods of time.

There is also a significant value inherent in the digital information the company must manage. Engineering drawings in particular are a product of multi million pound projects; to recreate the information would cost significantly more. Recent analysis has suggested that the cost of recreating one signalling drawing would be several thousand pounds. Multiplying this figure over the 1.2 million engineering drawings held by the National Records Group will indicate the scale of the information asset that is managed by today's railway.

In order to secure the future of the company's digital assets the National

Records Group is currently developing three new Network Rail standards, the implementation of which will protect digital information in the relatively short to medium term and lay the foundation for its long term survival. These new standards will focus on an overarching digital preservation policy, and two further standards which will focus on file formats for digital preservation and metadata for digital preservation. The corporate archive is also working on the development of an appropriate digital platform on which to manage those digital records it wishes to keep permanently.

## **Conclusion**

The National Records Group is able to deliver for Network Rail a records management service that takes into account the whole of the records lifecycle. Its processes enable people to manage their records effectively from the moment they are created by providing support for the use of the company's content management systems and professional liaison with the people and projects that create those records. The management of asset related information, its version control and supply to engineering projects enables Network Rail to plan ongoing maintenance and undertake important development on the railway infrastructure. It also enables trains to make their journeys, run over points, through signals and tilt to achieve maximum speeds safely. Record collections that date back centuries are managed to support today's development of Network Rail's property portfolio to generate income that is invested in the improvement of the railway. The off-site storage service works to manage those hard copy records that are not required every day but which need to be retained, and work on digital preservation will also enable electronic assets to be retained over time. And now, engineering records that date from the very earliest days of the railway sit alongside a business archive that demonstrates Network Rail's governance and development of that same infrastructure today. The National Records Group as Network Rail's centre of excellence for records management is providing the best possible support for the company as it strives to provide Britain with a safe, reliable and efficient railway fit for the twenty first century.

## Notes

<sup>1</sup> <http://www.irms.org.uk/awards>

Information and Records Management Society, Award Recipients. Accessed 15 January 2011

<sup>2</sup> The suite of Network Rail standards relating to records management, published in 2009/2010 are:

- Document & Records Management (NR/L2/INF/02220)
- Records Management (NR/L3/INF/02225)
- Document Creation & Approval (NR/L3/INF/02221)
- Metadata for Documents & Records (NR/L3/INF/02222)
- Information Security Classification (NR/L2/INF/02223)
- Sharing Framework for Information (NR/L3/INF/02224)
- Scanning of Documentation (NR/L3/INF/02236)
- Corporate Records Retention Schedule (NR/L3/INF/02226)
- Disposal of Records (NR/L3/INF/02231)
- Corporate Archive (NR/L2/INF/02230)

<sup>3</sup> <http://www.networkrail.co.uk/aspx/7673.aspx>

Network Rail Corporate Responsibility Report 2010. Accessed 15 January 2010.

The rail passenger modernization achievements highlighted in chapter 1, dating from the mid 1960s in Japan, the early 1980s in France, and the early 1990s in Germany, have shown that technological determinists were wrong. In different geographic, economic, and social settings—with different policy communities and political dynamics—passenger trains could be either invented or reinvented to serve a useful purpose and in so doing attain commercial success. If one were to look at organizational and resource inputs as a guide to industrial renewal, then North American passenger trains’ problems would appear to have been well on their way toward resolution in the 1970s. Even before French and German rail renewal efforts

For nearly two centuries, railways in Eastern Europe have developed along lines very different from their counterparts in the West, in many respects replicating key elements of transport in the United States. Eastern Europe featured relatively long distances coupled with a lower population density, factors that delayed railway development and generated a more dispersed transportation network. World War II left the Eastern European rail network in ruins, and Soviet domination of the region ensured that the rebuilt lines would be largely isolated from the West. At the same time, the command economies of the USSR and its satellites envisioned rail development as critical to rapid industrialization and individual mobility.

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