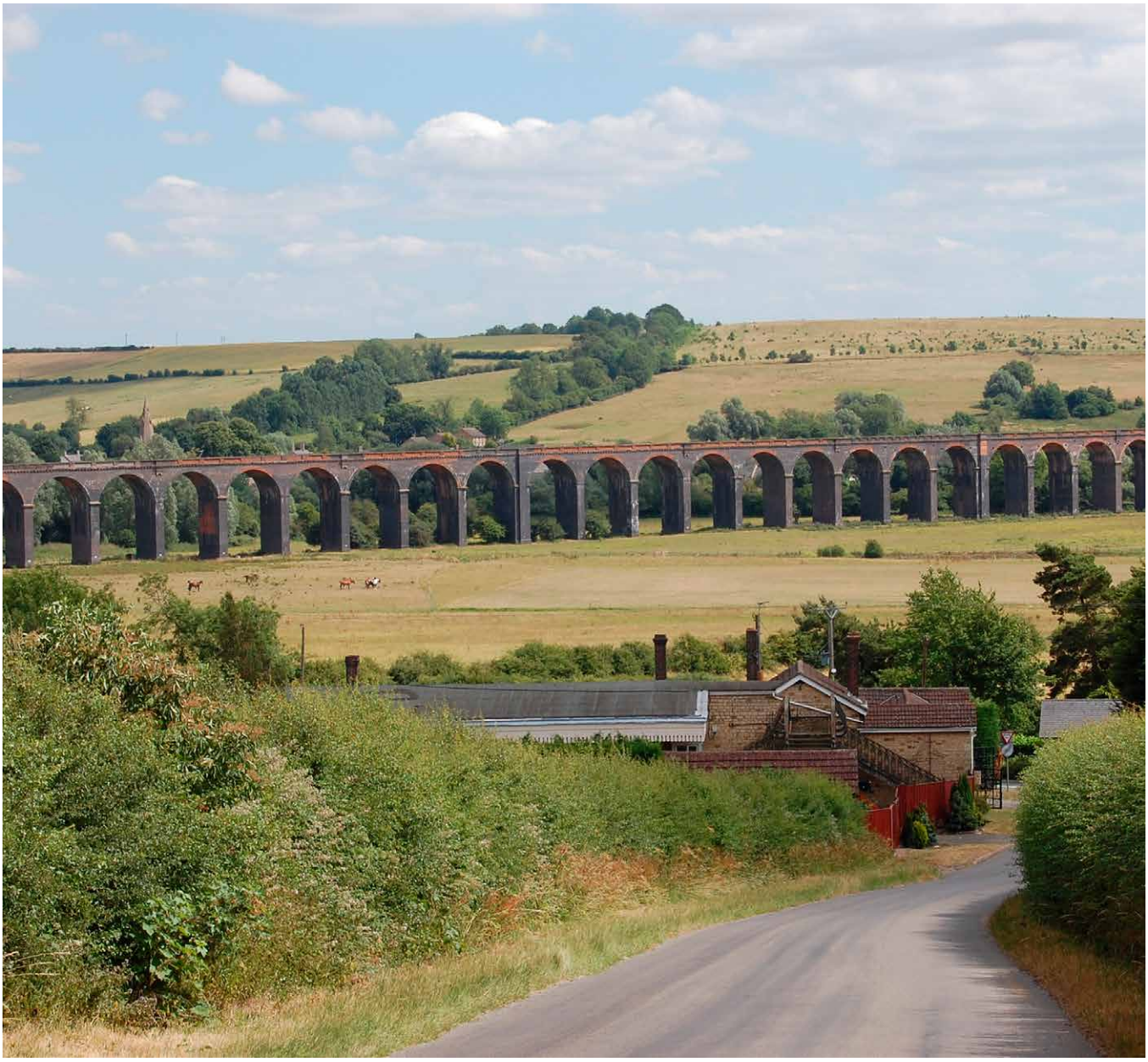
Historic England

Infrastructure: Transport

Listing Selection Guide



Summary

Historic England's twenty listing selection guides help to define which historic buildings are likely to meet the relevant tests for national designation and be included on the National Heritage List for England. Listing has been in place since 1947 and operates under the Planning (Listed Buildings and Conservation Areas) Act 1990. If a building is felt to meet the necessary standards, it is added to the List. This decision is taken by the Government's Department for Digital, Culture, Media and Sport (DCMS). These selection guides were originally produced by English Heritage in 2011: slightly revised versions are now being published by its successor body, Historic England.

The DCMS' *Principles of Selection for Listing Buildings* set out the over-arching criteria of special architectural or historic interest required for listing and the guides provide more detail of relevant considerations for determining such interest for particular building types. See https://www.gov.uk/government/publications/principles-of-selection-for-listing-buildings.

Each guide falls into two halves. The first defines the types of structures included in it, before going on to give a brisk overview of their characteristics and how these developed through time, with notice of the main architects and representative examples of buildings. The second half of the guide sets out the particular tests in terms of its architectural or historic interest a building has to meet if it is to be listed. A select bibliography gives suggestions for further reading.

This guide assesses structures associated with all forms of transport. The turnpike and canal systems revolutionised road and water travel, and arguably made the Industrial Revolution possible. Railways are a British invention and their early remains are of international significance. Cars democratised travel and so ubiquitous are they that the distinctive historic environment they have created is often taken for granted. Air travel created an exciting 'brave new world' spirit that is reflected in the modernist style of the first generation of air terminals.

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Front cover
The Welland Viaduct, on the Northamptonshire-Rutland county boundary, built 1876-8: England's longest at almost 1.2 km. Listed Grade II.

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Introduction

The modern age is characterised by speed of physical communication and the ability to cover long distances with increasing ease – by road, water, rail and air. Road and water travel were revolutionised by the turnpike and canal systems that made the Industrial Revolution possible. Railways are a British invention and their early remains are of international significance. They gave the Industrial Revolution its impetus and staying power, and transformed the personal lives of millions. Air travel created an exciting 'brave new world' spirit that is reflected in the modernist style of the first generation of air terminals. Cars democratised travel and so ubiquitous are they that the distinctive historic environment they have created is often taken for granted; with a few exceptions, it is only recently that assessment has begun of its designation merits.

Road surfaces, signs, street lamps, traffic control and bus shelters and the like are also covered in the Street Furniture selection guide. For docks, harbours, quays, ferry terminals, and ship-related matters see the Maritime and Naval Buildings selection guide, for railway works, industrial tramways, warehouses, and car-factories see Industrial Buildings, and for motels and road-houses see Commerce and Exchange Buildings.

1 Historical Summary

1.1 Up to 1714

The infrastructure for internal communication by land and water remained almost totally undeveloped until the mid-seventeenth century and widespread improvements did not occur until the eighteenth. Road transport in the medieval and early modern periods was slow and cumbersome – it was considered fast in the fifteenth century for information to travel by land from Devon to East Anglia in five days; St Albans was a day's travelling distance from London. Road improvement depended upon the initiative of the church, charitable individuals or institutions, and usually took the form of bridges and causeways; some municipalities paved portions of their principal streets. Early improvements in the internal waterways network include the building in 1564-6 of the five-mile long Exeter ship canal; most investment went into drainage rather than navigation.

1.2 Georgian

The period saw the beginning of a transport revolution. Turnpike roads, which levied tolls from travellers to finance road improvements, were a pre-condition of industrialisation and economic development. They were established in the 1660s, but the main period of growth took place in the next century: the principal arterial roads out of London were turnpiked by 1750 and the greater part of the network of main roads by 1780. By 1800, 4,000 turnpike trusts controlled 22,000 out of 105,000 miles of highway, and toll houses were common. By 1835 there were 14,000 regular wagon services nationally and the stagecoach service between London and Birmingham rose from one a week in 1740 to 34 a day by 1829. All of this was further facilitated by improvements in bridges and surfacing, notably the graded and cambered stone surfaces pioneered by John McAdam. Many completely new stretches of road were constructed in the early nineteenth century and these are often of considerable engineering interest. From 1862 turnpikes came to be administered by Highways Boards and entered the public domain. Tram or wagonways – early railways, for the local carriage of coal and the like from mines and quarries – which had begun in the early seventeenth century, expanded especially in industrial areas, as did packhorse routes, which received many new bridges between 1660 and 1740. Engineer James Brindley's Bridgewater Canal (1759-61), whilst not the first canal in England, sparked off the *canal age* that saw 4,000 miles of canals in place by 1850 (Fig 1). Building activity reached its height in the 1790s – canals continued to operate well into the railway era – but the network was mostly complete by the 1830s and underwent little expansion thereafter.

1.3 Victorian and Edwardian

The key development in land communication in this period was the railway, followed by the tram, both forms of transport taking over from vehicles – carts, carriages, gigs, and so forth – previously pulled by the horse, which was gradually eclipsed during the period. The railway was the culmination of the transport revolution, and was to have major consequences in economic, social and cultural terms. Its origins lay in the Georgian period, but the railway system's development was one of the greatest achievements of the Victorians. Its history falls into four distinct phases. The pioneering first phase extends from the opening of the Stockton to Darlington (1825) and Liverpool and Manchester (1830) Railways (both George Stephenson) to the completion of

Figure 1
Bridgekeeper's House, Fretherne Bridge, Fretherne, Gloucestershire. One of a series of classically-inspired houses along the Gloucester-Sharpness canal of the early nineteenth century. Probably designed by Robert Mylne who had acted as Surveyor to the company in 1793. A high degree of architectural interest and individuality is given to what is more usually an unremarkable building type. Listed Grade II.

the Great Western Railway from London to Bristol in 1841. The second phase runs from 1841 to 1850, and marks the heroic age of railway building and the period of 'railway mania' in which commercial speculation and the competition for routes led to the frantic construction of lines, including the Great North Railway and the laying of many of the main trunk lines that form the basis of today's inter-city network. The third phase, from the 1850s to the 1870s, saw the consolidation of the network including the opening of the dramatic Settle to Carlisle line, carrying the Midland Railway into Scotland.

The fourth period runs up to 1914, and saw the completion of the network. Railway stations developed alongside the network as a distinct building category, and combined engineering audacity with architectural sophistication to produce monuments to a new age.

London was the first city in the world to have an underground railway: the Metropolitan Railway (opened 1863, Sir John Fowler, engineer) was of cut and cover construction. The first underground electric 'tube' train service (now part of the Northern Line) opened in 1890 but a variant of the technology that made this possible – the tunnelling shield – had previously been used by Marc and I K Brunel when constructing a foot tunnel under the Thames at Rotherhithe in 1825-43. Tunnels were an essential component of the railway network from the beginning: the Severn Tunnel (1873-86, T A Walker) remains one of the outstanding feats of railway engineering. Some, for instance on the Great Western and the London and Birmingham lines had elaborate portals, creating architectural statements of great power.

Horse-drawn omnibuses appeared in the 1820s, horse-drawn trams in the 1860s and electrified trams from 1880s. Taking over from the horse-tram, the electric tram was introduced from 1883 and its operations brought about large-scale changes to city centres through the need for road widening and exceptionally, as on London's Kingsway, underground tunnels. Local Improvement Acts allowed the expansion of this new form of urban transport which in its wake created tram shelters (for both passengers and staff), generating stations, sub-stations, and bridges, together with large maintenance depots and tramsheds.

1.4 Twentieth century

The twentieth century saw revolutionary strides in road and air transport. Motor cars appeared in the 1880s though more significantly, the first petrol-powered cars were imported in 1895. Then in 1896, the four miles an hour a speed limit (determined by the maximum speed of the

pedestrian required by law to walk in front of the car) was abolished, and the age of the car truly arrived. Spending on roads in England increased by 85 per cent between 1890 and 1902 (by when motor buses were coming into general service) in response to increased road traffic. The further growth of the national road network in the 1920s saw the creation of arterial roads to carry heavy traffic, also the first by-passes and ring roads, and a new system of A and B road classification: the Dover Road became the A2. Motor houses and repair garages emerged as new building types, as did car parks, including early multi-storey examples. Stabling, once a common building type, declined rapidly as horses left the street scene – as did manure depots. Roundabouts with gyratory systems were introduced in 1926. Dual carriageways were slow to spread and Britain remained well behind the USA and Germany in the inter-war years, especially with regard to traffic management such as slip roads, overpasses and underpasses. However where dual carriageways were constructed during the 1920s it was not uncommon for them to be incorporated with other transport systems, such as tramways in the centre. The first major upgrading did not come until the motorway programme of the 1950s: the M1, the Preston by-pass, opened in November 1959.

The first powered flight took place in England in 1908. The First World War saw huge strides in aircraft technology, and established air travel for good. Alcock and Brown's crossing of the Atlantic in 1919 heralded a new epoch for global travel. There was great public interest in flight between the wars, and 'air-mindedness' – a forward-looking embracing of the potential of this new mode of travel – was widespread. The first regular international service operated between London and Paris from 1919 and Croydon became the capital's main airport (1920) with the first integrated passenger terminal and control tower designed in an old-fashioned classical revival style (listed Grade II). Although funding was to remain precarious, air travel and airports came to represent the brave new world: municipalities clamoured to possess a terminal – Wythenshawe for Manchester, 1930, was the first – and they adopted a futuristic modernist vocabulary to convey the excitement of flight, replete with viewing terraces for those who did not actually fly. Airships too enjoyed a short period of prominence up to the R101 disaster of 1930. Post-war developments saw the arrival of jet aircraft (requiring longer runways and larger servicing facilities) and a huge rise in passenger traffic from the 1970s onwards. More than most building types, airports are subject to constant and radical change, and some terminals have already been given new uses.

2 Specific Considerations

As with all building types, transport buildings have to be assessed in terms of their intrinsic value – special architectural, historic, planning, engineering and technological interest. The explosion in the number of turnpikes, canals and railways led to considerable standardisation, and for structures which post-date this greater selection is required. But the revolutions these reformed modes of transport represent are of national and in some cases international significance. The key to selection is to assess them in the context of the mode of transport they were built to accommodate – road, water or rail – and the period in which they were built; key phases for these are given in the history section above.

Certain canals, railway or Underground lines possess particular interest because of their historical significance, deriving from its pioneering date, engineering sophistication or influential nature. Elements on such networks will possess an extra level of interest on account of this associative interest, or linear group value, as it might also be termed. In general, the more complete a transport complex is, the stronger the case for listing will be, as different components lend group value to each other, and show how the complex functioned overall. Isolated survivors – a passenger terminal, an engine shed – may however have special interest in their own right.

Transport buildings of the twentieth century, and particularly the post-war period, present particular challenges for listing. Firstly, they were sometimes intended to have only short operational lives, although they sometimes remained in use for much longer periods than originally planned for. The envisaged short- term nature of such structures may be apparent in the quality of their design and construction, and may also (but not necessarily) imply limited historic interest. Given the strict criteria for more recent structures, these things needs to be borne in mind when assessing them for listing. Secondly, many transport buildings show signs of having been considerably altered, to meet changing requirements and the evolution of transport modes. Such alteration can sometimes be of clear interest in its own right; in other instances, such alteration may have detracted from the architectural coherence of the structure. Other structures exist in such huge numbers (for instance, post-war multi-storey car parks) that the pervasive poor architectural quality of the majority makes it difficult to appreciate the pioneer or innovative examples of the best.

Another designation point worth considering is the extent to which a complex may possess special interest in parts. Modern practice is to be as clear as possible just where the significance lies in describing a site's components. Sometimes

it will be the overall complex: on other occasions, it will only be elements which possess special interest. This should be made as clear as possible in all List entries.

Individual buildings must be assessed on their own merits. However, it is important to consider the wider context and where a building forms part of a functional group with one or more listed (or listable) structures this is likely to add to its own interest. Key considerations are the relative dates of the structures, and the degree to which they were functionally inter-dependent when in their original uses.

2.1 Bridges

Most pre-1850 bridges, where substantially intact, will warrant serious consideration for listing (Fig 2). Where they have been subsequently altered or modified they may still merit serious consideration where the modifications reflect the evolution and development of a particular route, but the extent of alteration and intrinsic interest will require careful analysis. Monumental bridges, or bridges that display significant technological innovation, may warrant listing in a higher grade. The rapid increase of transport projects for turnpikes, canals and railways created the need for standardised and less spectacular bridges: for these, greater selection will be required.

Regarding bridge technology, it is worth remembering that the eighteenth century marked the high point in the theory and practice of masonry bridge construction: Robert Mylne's Blackfriars Bridge of 1760-9 (demolished) represented its acme. But increasing demand required quicker solutions. Timber bridges and viaducts, once quite common but subject to unavoidable deterioration, are now extremely rare. Arched iron bridges (the first – now a Scheduled Monument and Grade-I listed building – being constructed at Ironbridge, Shropshire, 1777-81, by the ironmaster Abraham Darby) were widely adopted in the early nineteenth century but a series of failures rendered cast iron risky for

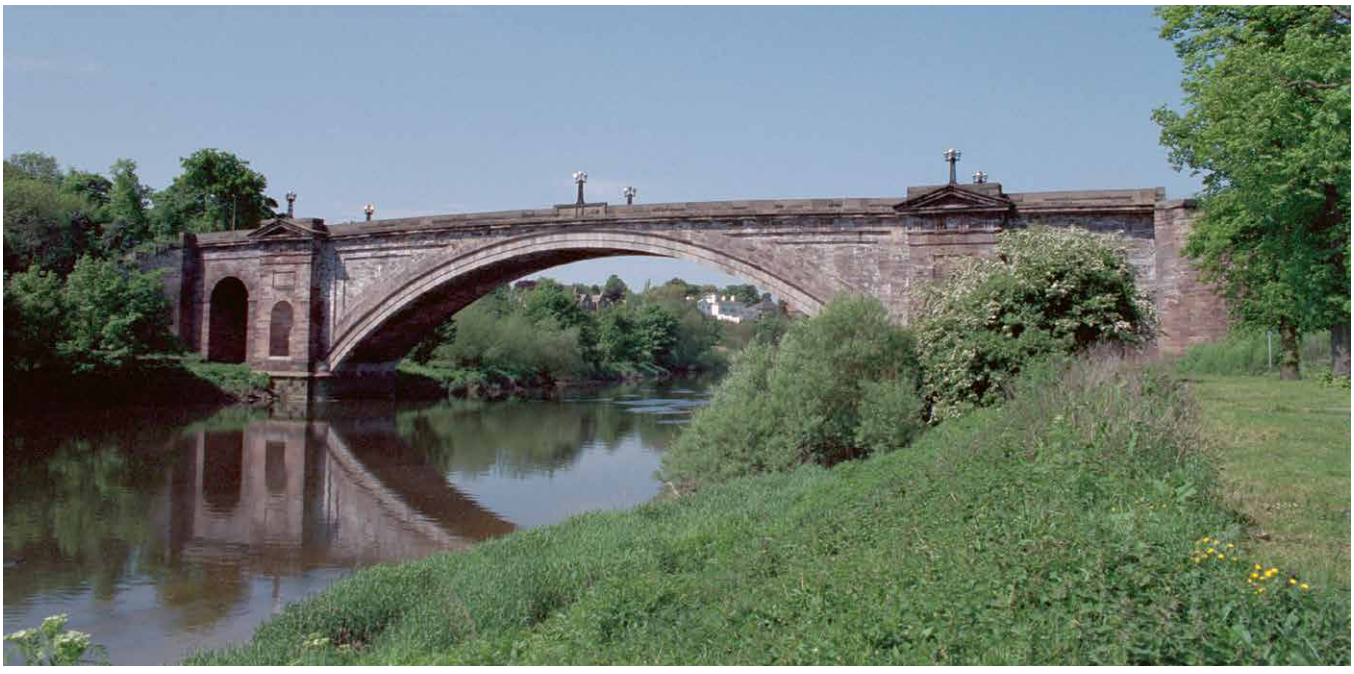

Figure 2
Grosvenor Bridge, Grosvenor Road, Chester. When designed in 1824 by Thomas Harrison the 200-foot single span of the Grosvenor Bridge was one of the longest in the world. The architect took care to provide separate passage for pedestrians and coaches at riverbank level. Listed Grade I.

Figure 3
A slender concrete footbridge to unite town and gown in the ancient cathedral city of Durham. Designed by Sir Ove Arup in 1963, its dramatic silhouette is complemented by the careful detail on a human scale. Listed Grade I.

major spans after 1847 (although many smaller and ornamental bridges continued to be built). Engineers turned more to metal truss bridges from the 1820s (combining small interconnecting members, some in compression, others in tension) and suspension bridges (Telford's over the Menai Straits of 1826 was among the earliest). Age, degree of survival and design interest will be the main determinants for listing, and some bridges will clearly warrant designation in an upper grade. Many bridges were major projects of civic improvement, and were often conceived on a grand scale: architectural treatment can thus be a key consideration, alongside engineering interest. Concrete for bridges was used from the late nineteenth century (mass concrete first used in 1877, reinforced in 1901); design quality as well as earliness of date and influence will be the key determinants of designation-worthiness (Fig 3). The first major use of steel (as opposed to wrought iron) in British bridges is the Forth Bridge (1890) and it came to predominate in the twentieth century in the form of box girder and suspension bridges. The general availability of pre-stressed steel and arc welding allowed for more elegant and slender bridges from the 1950s – some of the best are small footbridges in sensitive settings, such as the Garret Hostel bridge (listed Grade II) at Cambridge of 1960 by Guy and Timothy Morgan – and some post-war bridges are of note in their use of high-quality detailed concrete finishes and refined engineering. Structural and aesthetic considerations will determine their listability.

2.2 Specialised canal structures

The canal network was largely in place by the 1830s and most canal buildings surviving in anything like their original form from before that date deserve serious consideration. Because of the lack of modernization along the canal network, the survival rate is remarkably high for some types of structure although bridges and locks, the ones most frequently found, have often been

subject to radical repair or rebuilding. There are two essential divisions which characterise canal bridges: one is whether they are fixed or movable – the latter can be swing bridges, as seen in the series of listed late nineteenth-century bridges over the Manchester Ship Canal, or bascule bridges (drawbridges) – the second is whether they carry public roads or provide access between private estates divided by a canal (in which case they are known as accommodation bridges). The latter were quite often movable. Aqueducts are the most spectacular of all canal structures, displaying both high architectural quality, engineering boldness and technological innovation in the form of cast-iron troughs: Longdon Aqueduct (Shropshire) (by Thomas Telford, 1795-6; listed Grade I) is among the earliest use in England of such features. Almost all surviving examples are already protected; later examples which have avoided listing will be assessed on the basis of age, degree of survival, design interest and group value. Locks, usually of the pound type (the first in England was on the Exeter Canal, 1564-6), are listable if appreciable parts of the original stone pound walls (and associated surfaces) survive; lock gates will rarely be early as they require regular renewal, and appropriate allowance must be made. The same emphasis on authenticity of fabric applies to tunnels: the first, near Preston, was opened in 1775. Age, degree of survival and the design interest of the portals will determine eligibility. Inclined planes to lift vessels out of the water, usually by means of caissons (also associated with early railways), were introduced on the canal system in the 1780s but most extant examples are late nineteenth century and tended to be short-lived; intactness (or otherwise) will be a key determinant. Boat lifts (that at Anderton, Greater Manchester, completed 1872-5, being the first) proved similarly uneconomic and accordingly are rare. Some of the more monumental structures – including the Anderton Boat Lift - and some lengths of relict canals are Scheduled Monuments.

Canal warehouses range from massive complexes like Ellesmere Port (Cheshire) to small individual warehouses such as those along the Grand Union Canal via the early specialised warehouses serving the Bridgewater Canal in Manchester. These can possess group value with other canal elements, and are eloquent reminders of transport's role in the Industrial Revolution. Settlements like Stourport (Worcestershire) grew up in the later eighteenth century, with new sorts of canal-related buildings creating a new form of settlement. Repair and maintenance yards, often linked to canal company offices, seem more susceptible than other canal structures to unsympathetic development: intact examples should be carefully assessed as to whether any of their boathouses or workshops are of particular interest. Stables were a necessary adjunct to these yards and warehouse complexes. Lock keeper and bridgeman's cottages range from unremarkable structures which could as readily be considered as typical houses of the period to distinctive, sometimes quite sophisticated pieces of 'polite' architecture (as with tollhouses) which sometimes share a company style such as the Neo-classical cottages on the Gloucester-Sharpness canal. Mileposts and toll offices are normally eligible for listing, particularly when they have a clear visual relationship with the canal.

2.3 Specialised railway structures

Railway buildings and structures fall into three broad categories. First, there are the new building types, invented specifically for the railways. Second, there are engineering works such as tunnels with their portals, cuttings and their retaining walls, bridges and viaducts. Third, there are building types that were adapted for railway use: these include warehouses, offices, engine and goods sheds, carriage works, stables and railway workers' housing.

When it comes to purpose-built railway structures, most pre-1850 buildings will often be of international significance as being among the earliest railway structures in the world, and even partial survivals need to be assessed carefully. The 1840s saw a massive expansion in the network and while the Italianate style was initially favoured, many designs were eclectic and realised in a variety of styles. Great care should be taken in seeking out work of this date because it is often hidden by later alterations and extensions.

Increasingly rigorous selection is required for buildings after about 1860: this reflects both the quantity of what remains, and the standardisation of design which was applied to buildings and structures erected along different railway lines. A number of factors should be taken into account when assessing buildings of the second half of the nineteenth century, which have often undergone considerable replacement (greater significance having been attached to the first-generation railway buildings). Railway companies had different approaches to construction and different house styles and, where possible, a representative sample of structures from each company should be listed if the architecture is distinctive. Some are rarer than others, such as the later Victorian 'Domestic Revival' stations designed for the Great Eastern Railway in East Anglia from the 1880s. Other regional factors may be relevant too – surviving smaller station buildings in urban areas such as Lancashire, Yorkshire, and Tyneside are very thin on the ground due to the de-staffing of stations and subsequent demolition in the 1970s. As with industrial buildings generally, group value can be a key determinant. Some stations and goods yards need to be assessed as a whole, especially where they demonstrate the phased evolution of the railway system, through alteration and extension. Rarity will always be a factor in listing assessments: for instance, attrition rates for some later Victorian railway buildings have been high, and it is not simply a question of 'the older, the better'.

Railway stations

These are among the icons of the modern industrial age (Fig 4). The first surviving example in the world is the former Liverpool Road railway station (and station master's house), Manchester, of 1830 (listed Grade I), designed by George Stephenson and resembling a terrace of smart town houses. The great termini and city stations were elaborate structures with massive train sheds that spanned several platforms and were fronted by prestigious hotels (see the Commerce and Exchange Buildings selection guide). Most are listed, sometimes at a high grade. By contrast, minor stations and other wayside buildings built pre-1850 were often quite plain and modest in their design. Multi-

Figure 4
The former Monkwearmouth railway station, Sunderland, designed for the York, Newcastle and Berwick Railway Co. in 1848. A building of considerable dignity now used as a museum following closure of the line. It retains much of its interior and the listing includes a later cast-iron footbridge attached to the rear of the station. Listed Grade II*.

phased stations can be of special interest as well, but judgment will be needed as to the coherence of the ensemble, and the claims of the component elements. Architecture and design quality, technical or construction interest, date, and extent of alteration will be key issues. Twentieth century stations can sometimes possess considerable architectural presence: of two stations designed for Southern Railways, Ramsgate, Kent (1926, designed by Maxwell Fry; listed Grade II; Fig 5) represents the classical approach, while Surbiton, Surrey (1937; also listed Grade II) the streamlined inter-war style. Oxford Road, Manchester (1959-60; listed Grade II) demonstrates that the structural boldness of Victorian stations continued to be an aspiration in the post-war period after rail nationalisation: here, British Railways commissioned the Timber Development Association to come up with a dramatic laminated timber roof of three conoid shells. Smaller stations comprising the main station building sometimes with staff accommodation, canopies, waiting shelters, footbridge, signal box and goods shed, survived in vast numbers at the beginning of the twentieth century but have suffered grievously from attrition and clearance. Timber buildings, especially waiting shelters, are maintenance-heavy and easily vandalised, and have consequently been very susceptible to replacement in recent years and are becoming increasingly rare. Reasonably complete ensembles, such as Ockley & Capel (Surrey; listed Grade II), a station of 1867 for the London, Brighton and South Coast Railway, may merit overall listing since they are now so rare: extra care needs to be taken to ensure that less obvious ancillary structures are fairly considered, alongside principal station buildings.

Engine sheds

These came in two principal forms – the circular, or roundhouse, and the through shed. Most have had their roofs completely renewed in the twentieth century; any shed with an original roof will be particularly rare.

Railway bridges and viaducts

The English railway system was constructed across a busy and often undulating landscape, necessitating the construction of many bridges

Figure 5
Ramsgate Railway Station, Kent. An unusual foray for railway station architecture into the neo-Georgian style and designed to resemble an enormous orangery or garden building. A notable early work (1924-6) by one of the later proponents of the Modern Movement in England, E Maxwell Fry, acting as chief assistant to J R Scott, the Southern's Chief Architect. Listed Grade II.

and viaducts. Up to the 1880s, many of these bridges were executed in masonry or brick. Early examples shared a lot in common with canal and road bridges, and often sport careful masonry in their detailing: date, degree of survival and design will be the principal considerations, while for later bridges it will be engineering interest which is a key determinant. In terms of iron bridges, wrought iron replaced cast iron for larger structures following the collapse of the Dee Bridge, Chester, in 1847. Iron in general was superseded very rapidly by steel in the late nineteenth century for bridges (the Forth Bridge of 1890 was the first use of steel for a major bridge) and indeed, following the collapse of a cast iron bridge at Norwood (London Borough of Croydon) in 1892, there was a major programme of replacing cast iron bridges of all kinds. So iron is very much a mid-nineteenth century material, and as there are now so few survivors, probably any substantial wrought iron bridges would be of interest.

The best listed viaducts are notable feats of engineering, striking in the landscape. A significant number are listed, 33 at Grade II* and four at Grade I. As with other railway buildings, those erected before 1850 will be serious candidates for listing, but increasing selectivity is necessary for later periods. Modest standard designs, replicated by the various railway companies, are unlikely to be of special interest. Degree of survival is important, but such structures are regularly repaired and allowance for a reasonable level of replacement fabric should be made. Where viaducts are early in date, on one of the pioneering lines such as the Liverpool and Manchester, and designed by one of the great railway engineers such as the Stephensons, Brunel or Locke, listing at a higher grade should be considered. Maidenhead viaduct (listed at Grade II*) in Berkshire, for example, was constructed in 1837-8 and was designed by I K Brunel. The Sankey viaduct (listed Grade I), in St Helens, Merseyside, by George Stephenson, erected in 1830, is the earliest such structure in the world. The aesthetic quality of the structure as a whole and the detail of the design are also a consideration. The 1841 Twemlow viaduct (listed Grade II) in Cheshire is relatively plain with a dentilled cornice beneath the parapet and vermiculated stone bands to the piers. However this, together with its stately 23 arch span, gives it special interest. The 1858 Hownes Gill viaduct (listed Grade II*), in Durham, has 12 elegant brick and ashlar arches on slender tapering piers, and is an imposing 150 feet high at the mid point. The 1839-40 Stockport viaduct (listed Grade II*) in Cheshire extends for a magnificent 27 arches, all in red brick. Hawthorne Dene viaduct (listed Grade II) in Durham is a relatively short six-arch structure of 1905, in brick and concrete, but has an elegant design with a giant central span and blind roundels in the spandrels. Iron viaducts are likely to be of interest. Early examples are decidedly rare – the best, such as Belah (Cumbria), have been lost. Even later examples, such as the 1877 iron and concrete Bennerley viaduct (listed Grade II*) in Derbyshire, may be of interest if innovative.

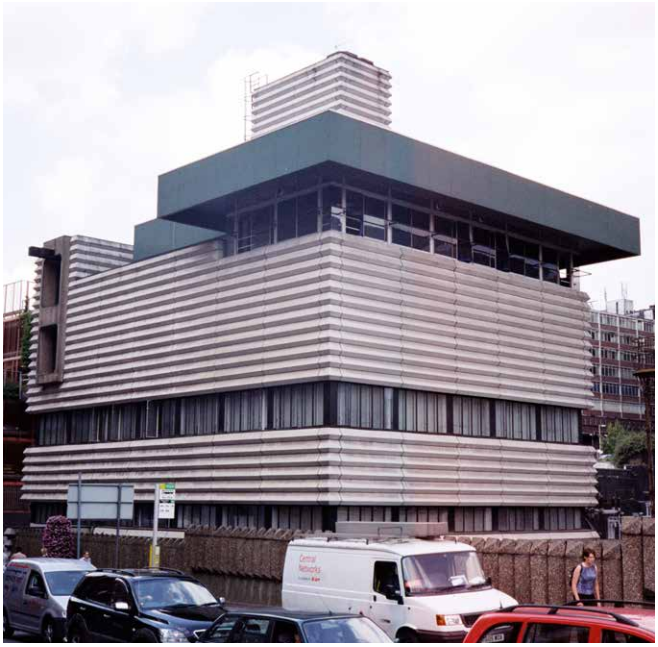

Figure 6
Birmingham New Street Signal Box, Navigation Street, Birmingham. A dramatic tour-de-force of the Brutalist style, opened in 1964, which gave the railway signal box typology a new lease of life in post-war England. Making clever use of a difficult site the architects Bicknell and Hamilton (with R L Moorcroft) created a building at once functional and iconic. Listed Grade II.

Signal and crossing boxes

Built from the 1860s, they are usually of two storeys (control levers above, locking mechanisms below) and have declined in numbers from 10,000 to 700, and most of those will soon be redundant too. Listing has attempted to protect a representative sample of the principal types and preference has been given to examples that have minimum impact on rail safety (for instance, those on preserved sites or lines). Retention of signal frames and levers will strengthen the case for listing. Coal drops, water tanks and columns, turntables and early footbridges are now rare. Birmingham's New Street signal box, completed 1964, is a relatively rare example of a listed signal box of the second half of the twentieth century (Fig 6).

The London Underground

A development of considerable importance, and its surviving fabric is correspondingly worthy of listing. This applies not only to the earliest generation of buildings from the 1860s, but also to the Edwardian and inter-war phases as well. The 1930s stations, many designed by Charles Holden, were part of a concerted effort on the part of Frank Pick to create a mass transit system that was efficient, humane and beautiful, and they remain greatly admired. Architectural quality, date and rarity of the type, and the degree of alteration will be key considerations; so is authenticity – reinstatement of replica features can be an issue to watch. In exceptional cases the special interest found in tiling and signage at platform level alone, as distinct from ground-floor level ticket offices and so on, may be enough to merit listing.

Figure 7
The Round House, Stanton Drew, Somerset. A particularly picturesque thatched former toll house of the eighteenth century designed for a turnpike trust. As was normal, its ground plan was designed to give a clear view of approaching traffic from its canted bays. Listed Grade II.

2.4 Specialised road structures

Tollhouses

These are often distinguished by half-polygonal ends giving views in each direction. Although cottagey in scale, they come in a variety of styles and have more in common with polite than vernacular architecture (Fig 7). Most tollhouses, especially as they will pre-date 1850, will be serious candidates for listing where they have survived with little alteration. Original interiors – anyway modest – are rare and therefore not to be expected. Where a tollhouse has received an unobtrusive extension, usually to the rear, this will not automatically disqualify it from listing. Road bridges are dealt with separately (above); horizontal road surfaces and street furniture (including signage) are covered in the Street Furniture selection guide.

Stables

Once very common, in town and country settings alike, wherever horses were kept for transportation, work or recreation. In urban settings they were traditionally accessed through carriage arches on street elevations, but on 'improved' urban estates from the eighteenth century they were more frequently assigned to mews in back lanes or courts behind the larger houses. They provided accommodation for horses in compartmented stalls, fitted with

Figure 8
A rare survivor of the days of the horse-drawn tram in London. This stable-block in Kingsland Road, Hackney, has a cobbled ramp to connect its four storeys. Listed Grade II.

mangers for feeding, with provision for storing saddlery, and with easily-draining floors to facilitate cleaning; accommodation for grooms was often placed at first floor level, alongside storage for hay and straw. Given the prized status sometimes accorded to horses, some stables were very elaborate architectural affairs indeed. Commercial stabling for transport horses was common on industrial sites and at some coaching inns. Victorian commercial enterprises such as the Co-operative Societies and transport companies (in particular, railway companies) sometimes constructed vast stables, sometimes on several levels, connected by gently sloping ramps (Fig 8). The disappearance of horse transport from the street scene has been one of the most marked changes of the post-First World War period. Commercial stables are rare survivals, especially in urban contexts, and judgment as to their special interest has to take into account their architectural interest, and the survival of horse–related features like stalls and sloped ramps.

2.5 Motor car buildings

The proliferation of the motor car transformed lives and the landscape; some are beginning to suggest this so characterised the century that it should be dubbed the Oil Age. Surviving purpose-built car-related buildings from the earliest decades, such as the first car sales showrooms, are very rare and are likely to be serious candidates for listing.

Car parking

Small motor houses (the early name for garages) begin to appear in the suburbs from about 1901,

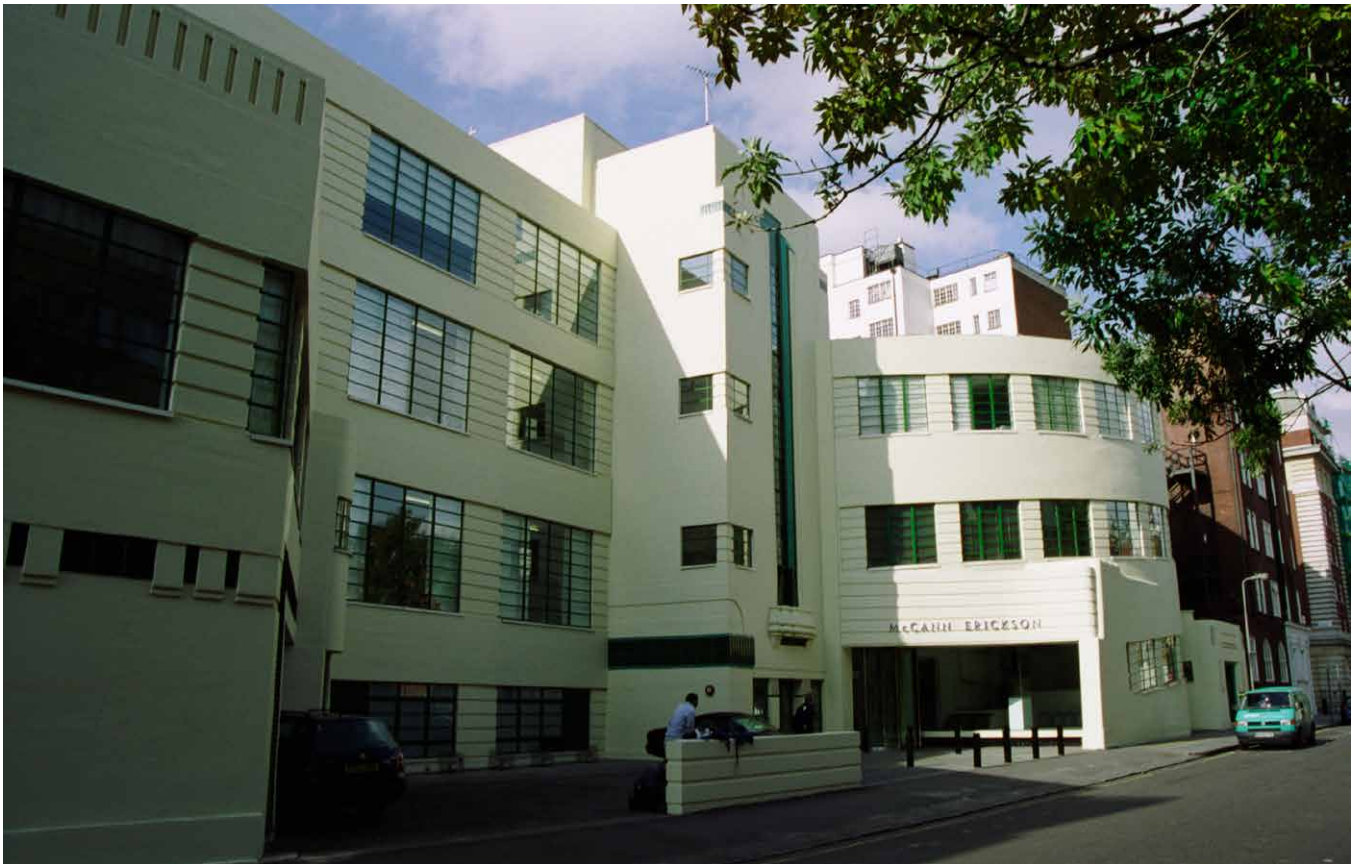

Figure 9
A striking multi-storey car park for the Daimler Company in Herbrand Street, London Borough of Camden, designed by Wallis, Gilbert and Partners in 1931. The building's functionalism is conveyed by the use of the Modern Movement style. Daimler-owned cars were stored to the upper floors whilst the lower floors were used as a car park, with waiting rooms, attendant's office, lavatories and telephones. Listed Grade II.

whilst prefabricated timber ones were advertised from about 1903 – these are very rare and no extant examples are known to exist. At country houses, garages were generally converted from existing stables and carriage houses, where new glass shelters might be provided to washing areas, and additional accommodation provided for chauffeurs. A small number of impressive purpose-built examples were built for new country houses, often small in comparison to converted stable blocks, but incorporating inspection pits and built-in cupboards.

Multi-storey car parks originated in the Edwardian period (when they were often sited close to major theatres) and relied on lifts to transport vehicles up to the upper decks. The ramped car park arrived in the 1920s and a number were built in London; they remained rare outside the capital.

To be listed, they should combine architectural interest – initially classical, latterly modernist - with technical novelty and a measure of degree of survival. Examples include J J Joass's Lex Garage of 1929 in Brewer Street, Soho, and the dramatically ramped former Daimler garage in Herbrand Street, Bloomsbury, of 1931 by Wallis, Gilbert and Partners (now adapted for office use; Fig 9); both are listed Grade II. Increased congestion and legislation designed to raise revenue from parking resulted from about 1960 in vast numbers of multi-storey car parks: exceptionally, they may be listable if they combine innovative planning such as continuous parking ramps and warped slabs with architectural panache, but the test for the listing of recent structures is a high one. In the post-war period it became more usual to combine multi-storey car parks with other building types, such as shopping

centres; theatre and roof-top restaurants (and even nightclubs); and bus-stations (such as Preston Bus Station; listed Grade II, Fig 12); and with large-scale housing developments – all were so-called 'Megastructures', a concept popularised by Reyner Banham's book of 1976 of the same name referring to large, post-war, complexes which were thought to herald a new approach to urbanism. In such cases the assessment of the car park element will need to take the claims of the entire complex into consideration.

Showrooms

Created for the sale of cars but also accessories and components such as tyres and batteries. Car showrooms emerged as a specific type of commercial premises in the late 1890s, originally being created in adapted shop premises but occasionally incorporated into car factories as at Clement Talbot, Ladbroke Grove (London Borough of Kensington and Chelsea). The Michelin building on London's Fulham Road (1909-11, by Francois Espinasse; listed Grade II) – an example of a component showroom – with its painted tiles depicting early grands prix, reflects its function and is one of the finest survivals of car-related architecture from this period. Purpose-built car showrooms began to proliferate from around 1906: one of the finest is the former Wolseley showroom on London's Piccadilly, by W Curtis Green (1921; listed Grade II), now a noted café with an elaborate marble-lined interior. In the 1930s showrooms began to move from city centres to suburban locations, adopting popular moderne styles, reflecting patterns of middle-class car ownership. The former Lincolnshire Motors motor showrooms and garage of 1959 by Sam Scorer, in Lucy Tower Street, Lincoln (now a library), is a rare later listed example (Grade II).

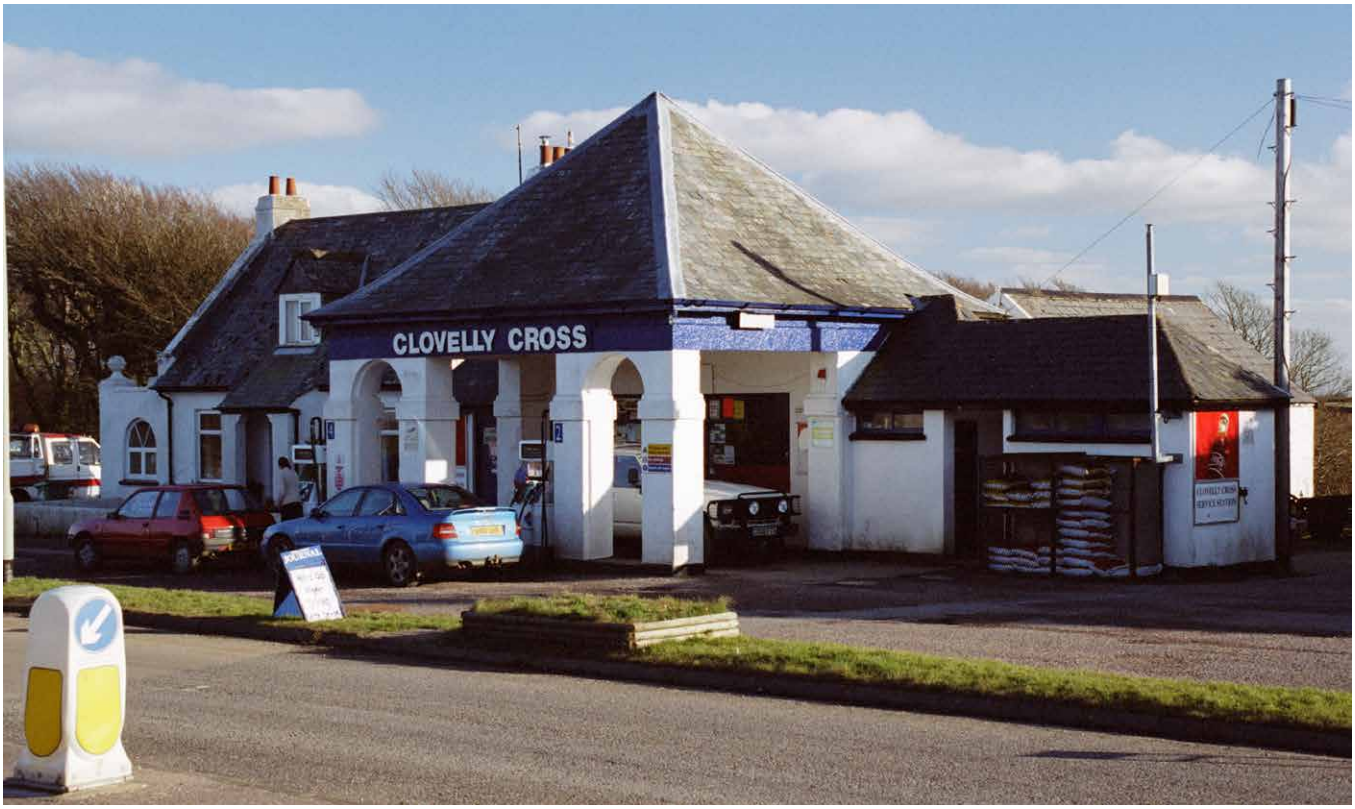

Figure 10
Petrol filling station, Clovelly Cross, Devon, 1930. Privately developed petrol filling stations quickly fell prey to the large multi-national firms in the post-war period. This one in Devon, by the local firm of Orphoot and Whiting of Bideford, includes a covered filling area and a house for the attendant in an engaging mix of domestic and country house style. Such survivors of the early days of motoring are becoming increasingly rare. Listed Grade II.

Petrol filling stations

The earliest purpose-built examples were formed of a lay-by or pull in, pumps, sometimes on an island, with an attendant's hut or kiosk. Petrol storage was in an underground tank, as today. Strong public opinion in the 1920s, co-ordinated by bodies such as the Council for the Protection of Rural England and the Design and Industries Association reacting against the spoliation of the countryside, led to improved designs that were consciously vernacular or locally sympathetic, like the 1930 example (with station attendant's house) at Clovelly Cross (Devon; listed Grade II; Fig 10); urban garages, such as the oriental-styled Park Langley Garage in Beckenham (London Borough of Bromley, 1928 by Edmund Clarke; listed Grade II) could be more attention-grabbing. While older petrol stations are increasingly rare, special architectural interest would have to be present for listing to be warranted. By the 1950s the use of concrete for filling station construction was common, with neon lit towers or canopies over the pump island to draw the attention of the passing motorist – the hyperbolic paraboloid roof of the former Markham Moor filling station, Nottinghamshire, designed by Sam Scorer (now converted to a Little Chef restaurant), being a particularly good example. In the 1950s oil companies also began to purchase increasing numbers of stations and develop corporate station designs. These soon became pervasive as small independent and regional companies gave way to large multi-national undertakings. Given the speed of change, any pre-1970s examples of the new corporate approach are now extremely rare and deserve consideration for listing; as with showrooms, architectural quality and degree of survival will be key determinants.

Other building types serving the car include service depots, established in large cities, notably in the inner suburbs of London, by manufacturers. Listed examples include Ford's, Brook Green, Hammersmith (Charles Heathcote and Sons, 1915; listed Grade II).

Motorway service stations

These came with the motorways. As a result of tight budgets most service stations were cheaply built, of concrete, and are stylistically bland – but there were exceptions. Some incorporated visually striking features, such as eating areas on bridges spanning the carriageways (Leicester Forest East on the M1 for example), or in towers (as at Forton on the M6 near Lancaster, of 1965). However, by the late 1960s, service stations had assumed the form they take today: two self-contained low-rise developments on either side of the motorway. Clear levels of architectural interest will be required for listing to be appropriate, and the threshold for listing buildings of such recent date is of course high.

Public road transport: buses and trams

The first horse-drawn buses appeared in London in 1829, and by 1890 there were around 25,000 in England. Surviving stabling for horse-drawn buses and trams, such as the late nineteenth-century four-storey example on Kingsland Road, London Borough of Hackney (listed Grade II, Fig 8), is extremely rare; other early examples will be strong candidates for listing. Electric tramways first appeared in 1883 and proliferated at the beginning of the twentieth century in the main urban centres; they soon gave way to the more flexible motor bus. Motor buses were proving profitable as early as about 1900 and some services were run by the railway companies. With the grubbing up of tramways from the mid-1920s roads became wider for all road users.

Many municipalities built large tram depots, often with ornate frontages that reflected municipal pride. In Bristol, during the 1900s, the Bristol Tramways and Carriage Company developed a domestic Wrenaissance house style under the architect W H Watkins which stood somewhat in contrast to the earlier gargantuan Baroque Revival generating station and tramsheds designed by W Curtis Green in 1899 (Fig 11). Depots could be little more than large open-air screen-walled enclosures with some rudimentary repair and maintenance facilities but were more usually large, top-lit structures with the roof supported on a dense pattern of supports. They were often designed to incorporate other elements such as the offices (as at Walthamstow, Essex, of 1905) or both the offices and generating station (as

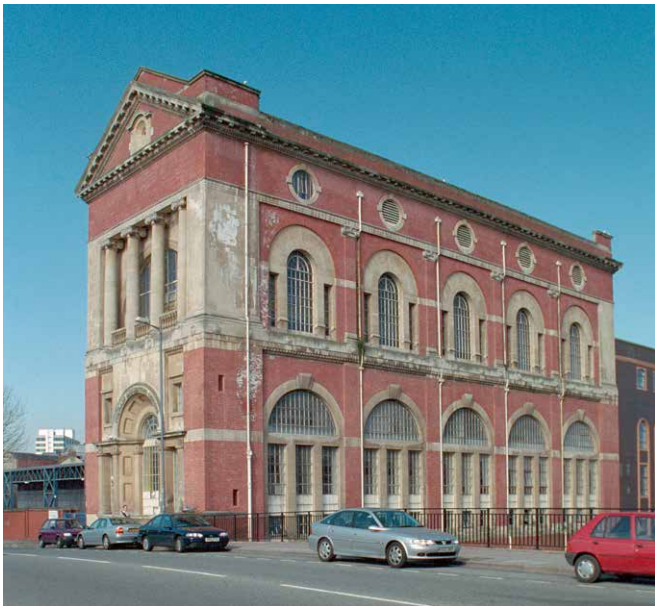

Figure 11
Tramway generating station, Counterslip Street, Bristol. Designed for the Bristol Tramways and Carriage Company in 1899 by W. Curtis Green. Such functional buildings were nonetheless conceived of as civic architecture and were a positive addition to the cityscape. Green went on to design similar structures in Hove and Chiswick. It has now been converted successfully to offices. Listed Grade II*.

Figure 12
Preston Bus Station and multi-storey car park, designed in 1969 by BDP Building Design Partnership (Keith Ingham project architect). The curving balustrades of the car-park create a monumental backdrop for the dynamic concrete ramps. Listed Grade II.

at Newcastle-upon-Tyne, of 1901). Such offices were often emblems of civic pride and designed at considerable expense. Shelters varied from being modest standardised cast-iron structures, as at Elms Road, Dover (Grade II listed) to more substantial civic buildings such as the matching pair of Free Baroque pavilions with copper domes at Darwen, Lancashire of 1902 (Grade II listed). Like depots they tended to move seamlessly from tram to bus operation and only the generating stations became redundant. Electric generating stations themselves, dating from the 1880s onwards, are rare, as are early tram shelters. Many tram depots survived as bus garages until recent years but are now very vulnerable, whilst tram shelters moved seamlessly into use for bus operation as at Brighton, East Sussex, where examples include the listed International style shelters of 1926 designed by the Borough Engineer, David Edwards.

Purpose-built bus garages or depots usually combined offices and a covered parking area, the latter generally top lit, single-storey and spanned by steel-framed roofs without intermediate support to facilitate vehicle movement and storage. A few important garages with concrete roofs were built in the late 1930s and early 1950s, partly following continental models, and partly responding to restrictions in the use of steel after the Second World War. These can be architecturally distinguished, for instance, Wythenshaw in Greater Manchester (1939-42), and Stockwell in London (1951-4; listed Grade II*). Bus stations tend to be conveniently located in town centres, whilst coach stations, intended for longer journeys than buses (with London's Victoria Coach station being a notable inter-war exception) are more usually to be found on the edge of town, and provided with comfortable waiting and refreshment areas. Bus stations would have a covered parking area or open-air island platforms, with or without shelters, along with offices, waiting

room, booking hall, and luggage store. One of the most ambitious, Preston's Bus Station and multi-storey car park (Fig 12), designed in 1969, was listed at Grade II in 2013. Saw-tooth platforms were widely adopted in the late 1950s. Integrated transport networks were a Modernist ideal: Southgate Underground Station (London Borough of Enfield; listed Grade II*) is alongside a London Transport bus station with distinctive signage and seating (listed Grade II). For depots, garages and stations, degree of survival, architectural quality and structural interest are the key considerations.

2.6 Buildings for flight

Early civil aviation buildings are rare and always worth careful consideration. Older termini tended to be small in scale, and many are now relegated to the edge of airports still in use (as at Birmingham), as runways and handling facilities have expanded with the arrival of jet aircraft and mass flight. Contexts have sometimes changed dramatically: Croydon terminus (listed Grade II), a particularly early example, is now surrounded by industrial buildings, but its special interest remains strong. Perhaps the finest survival of municipal airport buildings in the country occurs at Liverpool's Speke Airport, designed by E H Bloomfield of the City's architecture department. There the curved terminal with beacon control tower (opened in 1937; listed Grade II*) is flanked by fine hangars creating a fine group, but once again it is now divorced from the flying field and has been converted into new uses.

Much aviation architecture was influenced by military structures, but terminal buildings (for freight and passengers), as at Gatwick (Surrey), Shoreham (West Sussex, listed Grade II; Fig 13) and Birmingham could display great architectural panache, placing them in the vanguard of modern design. This very much applies to the outstanding Grade II listed Dunstable Gliding Club premises in Bedfordshire of 1935-6, designed by Kit Nicholson. Flight was for the few, but many came to watch

Figure 13
Shoreham Airport, West Sussex. A small municipal airport terminal comprising control tower, offices, customs hall, restaurant and bars, designed by Tiltman and Bodell and completed in 1936. The use of the International Style for airports became the norm in the inter-war period and Shoreham remains unusual in not having been engulfed by later developments. Internally much of the original period decoration, fixtures and fittings survive, adding to its significance. Listed Grade ll.

Figure 14
The flight test hangar, offices, fire station, and control tower, British Aerospace, Comet Way, Hatfield, Hertfordshire. A complex built for the world's first jet-airliner, the De Havilland Comet, by James M Monro and Son with Structural and Mechanical Development Engineers Ltd. The use of aluminium for the hanger, built 1952-3, was daringly innovative, whilst the entire complex speaks eloquently of the early days of jet travel. Listed Grade II*.

from viewing terraces. Control towers only became compulsory from 1944 but earlier examples survive, as at Brooklands, in Surrey (listed Grade II).

The oldest surviving hangars pre-date the First World War. Originally concrete or timber framed, most are of steel construction and may be important for engineering reasons: the need to create unencumbered spaces wide enough to receive aircraft led to considerable ingenuity in roof technology. This included concrete construction, as well as wooden and steel roofing systems: the Grade II listed arched concrete hangar of 1929 at the former Heston Air Park in west London is a notable example. The airship hangars at Cardington (Bedfordshire; listed Grade II*) of 1917 and 1927, associated with Britain's short-lived lighter-than-air programme, represent the extremes of the colossal scale that such buildings could attain. Some aircraft manufacturers created premises of note, such as the Bristol Company's at Filton, outside Bristol (such factories are considered in the Industrial Buildings selection guide). Post-war aviation buildings have grown in scale and complexity, and have often undergone extensive change (if not outright replacement). Certain key structures have been listed for historical, architectural and structural engineering interest, such as the Comet Hangar at Hatfield (Hertfordshire) (James M Munro & Son, 1954; listed Grade II*; Fig 14): when built, it was the world's largest permanent structure built of aluminium. Sir Owen Williams's Technical Block A at Heathrow Airport (1950-55; Grade II*) demonstrates the technical importance that concrete structures could still attain. No post-war airport terminal building has been listed.

2.7 Historic interest

Occasionally transport buildings may be listable because of their historic interest. For example, offices at the Ladywood Works, Lutterworth, Leicestershire, structures of little architectural merit, are listed at Grade II* as it was in these that Sir Frank Whittle made the key advances between 1938 and 1941 in the development of the world's first viable jet engine.

2.8 Extent of listing

Amendment to the Planning (Listed Buildings and Conservation Areas) Act 1990 provides two potential ways to be more precise about what is listed.

The empowerments, found in section 1 (5A) (a) and (b) of the 1990 Act, allow the List entry to say definitively whether attached or curtilage structures are protected; and/or to exclude from the listing specified objects fixed to the building, features or parts of the structure. These changes do not apply retrospectively, but New listings and substantial amendments from 2013 will provide this clarification when appropriate.

Clarification on the extent of listing for older lists may be obtained through the Local Planning Authority or through the Historic England's Enhanced Advisory Service, see www.HistoricEngland.org.uk/EAS.

3 Select Bibliography

3.1 General

Buchanan, A, *Industrial Archaeology in Britain* (1972)

Cossons, N, *The BP Book of Industrial Archaeology* (1975)

Holder, J, and Parissien, S, (eds), *The Architecture of British Transport in the Twentieth Century* (2004)

Stratton, M, and Trinder, B, *Twentieth Century Industrial Archaeology* (2000)

Trinder, B, (ed), *The Blackwell Encyclopedia of Industrial Archaeology* (1992)

Banham, R, *Megastructure: Urban Futures of the Recent Past* (1976)

3.2 Road transport

Henley, S, *The Architecture of Parking* (2007)

Holder, J, 'From Chaos to Control: The Architecture of the Bus and Coach Station in Inter-war Britain', pages 189-218 in Holder, J, and Parissien, S, (eds), *The Architecture of British Transport in the Twentieth Century* (2004)

Jeremiah, D, 'Architecture for the Motor Car', pages 161-88 in Holder, J, and Parissien, S, (eds), *The Architecture of British Transport in the Twentieth Century* (2004)

Morrison, K A, and Minnis, J, *Carscapes: the Motor Car, Architecture and Landscape in England* (2012)

Morriss, R K, *Roads: Archaeology & Architecture* (2005)

Worsley, G, *The British Stable* (2004)

3.3 Bridges

Cossons, N, and Trinder, B, *The Iron Bridge* (rev edn 2002)

Harrison, D, *The Bridges of Medieval England* (2004)

Jervoise, E, *The Ancient Bridges of England* (4 vols., 1931-6)

Ruddock, T, *Arch Bridges and their Builders 1735-1835* (1979)

Saint, A, *Architect and Engineer* (2008)

3.4 Canals

Giles, C, and others, *Stourport: Pioneer Town of the Canal Age* (2007)

Harris, R, *Canals and their Architecture* (1980)

McKnight, H, *The Shell Book of Inland Waterways* (1981)

3.5 Railways

Biddle, G, *Victorian Stations* (1973)

Biddle, G, *Great Railway Stations of Britain* (1986)

Biddle, G, *Britain's Historic Railway Buildings* (2011)

Fawcett, B, *Railway Architecture* (2015)

Lawrence, D, *Underground Architecture* (1994)

Lawrence, D, *Bright Underground Spaces: The Railway Stations of Charles Holden* (2008)

Minnis, J, *Signal Boxes* (2013), available at https://historicengland.org.uk/images-books/publications/iha-signal-boxes/

Minnis, J, *Railway Goods Sheds and Warehouses* (2015), available at https://historicengland.org.uk/images-books/publications/iha-goods-sheds/

Parissien, S, *Station to Station* (1997)

Stamp, G, 'Early Twentieth Century Stations', pages 23-46 in Holder, J. and Parissien, S. (eds.), *The Architecture of British Transport in the Twentieth Century* (2004)

The Signalling Study Group, *The Signal Box* (1986)

3.6 Flight

Bingham, N, 'Arrivals and Departures: Civil Airport Architecture in Britain during the Interwar Period', pages 106-32 in Holder, J, and Parissien, S, (eds), *The Architecture of British Transport in the Twentieth Century* (2004)

Hawkins, B, Lechner, G, and Smith, P, (eds), *Historic Airports (Proceedings of the International L'Europe de l'Air Conferences on Aviation Architecture)* (2005)

Zukovsky, J, (ed), *Buildings for Air Travel Architecture and Design for Commercial Aviation* (1996)

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