

TRANSPORT HERITAGE :
AN ASSESSMENT OF NEEDS AND POTENTIAL

Final Report

The Transport Trust
202 Lambeth Road
London SE1 7JW

TRANSPORT HERITAGE : **AN ASSESSMENT OF NEEDS AND POTENTIAL**

CONTENTS

- 1 Executive Summary**
- 2 Introduction**
 - 2.1 Glossary of terms
 - 2.2 Acronyms
- 3 Aviation**
 - 3.1 Scope and summary matrix
 - 3.2 History
 - 3.3 Airfields
 - 3.4 Prioritisation
 - 3.5 Summary of category needs
 - 3.6 Pioneer Period
 - 3.7 Inter-war Period
 - 3.8 World War II Period
 - 3.9 Post-War - general, including executive and light aircraft
 - 3.10 Post-War - commercial
 - 3.11 Post-War - military
 - 3.12 Post-War- rotary
- 4 Buses and Coaches**
 - 4.1 History
 - 4.2 Basic details
 - 4.3 Physical needs
 - 4.4 Documentation
 - 4.5 Human resources
 - 4.6 Public access
 - 4.7 Funding
 - 4.8 Prioritisation
 - 4.9 Summary of category needs

5 Railways

- 5.1 Basic details
- 5.2 Physical needs
- 5.3 Documentation
- 5.4 Human resources
- 5.5 Public access
- 5.6 Funding
- 5.7 Prioritisation
- 5.8 Summary of category needs

6 Maritime (small ships and boats)

- 6.1 Canals and inland waterways
- 6.2 Classic Motor Boats Association
- 6.3 Dunkirk Little Ships
- 6.4 Fishing Boats
- 6.5 Lifeboats
- 6.6 Military Boats
- 6.7 Old Gaffers
- 6.8 Steamboats
- 6.9 Thames Vintage Boat Club
- 6.10 Thames Traditional Boat Society
- 6.11 Vintage Wooden Boat Association
- 6.12 Museums
- 6.13 Summary of category needs
- 6.14 Summary matrix

7 Review of Issues

- 7.1 The need for a strategic view of preservation
- 7.2 Private ownership
- 7.3 Collections
- 7.4 Grading
- 7.5 Restoration
- 7.6 Replicas
- 7.7 Operation
- 7.8 Foreign items
- 7.9 Commercial versus heritage
- 7.10 Secure accommodation
- 7.11 Ongoing Maintenance
- 7.12 Archives
- 7.13 Sustainability
- 7.14 Co-ordination within categories
- 7.15 Conservation or serving the public

8 Conclusions

Appendix 1 - The study brief

Appendix 2 - Sources of information

TRANSPORT HERITAGE : **AN ASSESSMENT OF NEEDS AND POTENTIAL**

1 EXECUTIVE SUMMARY

The Heritage Lottery Fund commissioned the Transport Trust as a neutral organisation concerned with all types of transport to carry out this study in pursuit of one of the objectives of the HLF Strategic Plan 1999-2002.

The transport sector touches people at many levels and has a wide appeal. As a result it is estimated that audiences and participants in heritage transport activities exceed 15 million people a year. Britain has a particularly rich transport history and has played a leading part in its technological and commercial development. Although there are good collections of artefacts in public sector museums, private sector transport preservationists make a major contribution to conservation and to the provision of the active enjoyment of transport by the public. This public interest is expected to continue provided competitive facilities are available.

The brief for this paper was to

- indicate the number of historically important items in the four categories, aviation, buses, railways, and boats;
- assess their needs in terms of conservation and infrastructure support;
- review the sustainability of public and enthusiast support;
- identify areas where public benefit can be obtained;
- consider the roles of museums and support organisations;
- examine the needs for archive facilities;
- review methods and progress on prioritisation.

Aviation

The widespread preservation of aircraft in the UK began in the 1960s when a large number of obsolete military aircraft became available. The need to co-ordinate the movement was met by the founding of the British Aviation Preservation Council (BAPC) in 1967. However no individuals and few private collections are represented there, and the associated infrastructure and artefacts together with civilian aircraft were neglected for many years. Although over 2,500 aircraft survive, which may be worthy of preservation, little progress has been made in developing a policy for the preservation of commercial and light aircraft. A recent BAPC survey found that many aircraft are kept outside, 4% of the highest graded and as many as 26 % of the second. Although some examples of airfield architecture have been saved, no early civil airport or pre-war RAF station has been preserved.

Overall British aviation preservation is in a healthy state and although the expansion of the 1970s and 1980s has slowed significantly, the sector continues to thrive. The movement is still divided between those who fly their aircraft and those who don't, although the Imperial War Museum at Duxford, near Cambridge, have shown that co-operation provides significant mutual benefit. The continuing area of neglect is civil aviation, in particular General Aviation since the end of the Second World War. Although there are significant airliners which are yet to enter preservation, most of the more important post-war airliners are in 3 major UK collections. These are the Science Museum's collection stored under cover at Wroughton in Wiltshire, the British Airways collection at the Royal Air Force Museum, Cosford near Wolverhampton and the Duxford Aviation Society collection displayed at the Imperial War Museum, Duxford. The major problem facing the latter two collections is that of external display and the inevitable corrosion which follows.

The key needs of the aviation category are

- prioritisation. The individual aircraft grading adopted by the BAPC should be extended to include the privately owned historic aircraft although it may not be easy to persuade the owners to co-operate;
- hangarage. More covered accommodation should be provided for the highest and middle graded aircraft in preservation;
- the preservation of civil aviation. A strategy is required for the acquisition, conservation and accommodation of important commercial and light aircraft and their supporting infrastructure;
- skills training. A programme of identifying the gaps in conservation skills is being conducted by the BAPC. When completed could be the basis of a skills training programme;
- operators of unique airworthy Benchmark aircraft should be encouraged to consider the construction of a look-alike replica and to grounding the original.

Buses and coaches

There are about 4,000 buses and coaches in preservation of which some 45% are in a recognised collection or museum, private or public, but less than 30% are restored. Most in museums are from the 1950s and 1960s with only 10% from before 1940, but over 80% of the total are owned by private individuals who alone and with little support have been responsible for most bus conservation. Little progress has been made in prioritising this assortment which is scattered all over the country, with some concentration in the cities.

Buses and coaches have had a significant impact on the social development of both town and country, especially between 1920 and 1960 and have a strong regional following.

The National Association of Road Transport Museums (NARTM) is the most active co-ordinating body but is limited to museums and collections, and does not cater for the private individual.

The key needs of the buses and coaches category are

- the completion of a category register of preserved buses as a prelude to introducing a grading system acceptable across the category which takes account of regional variations;
- a strategy for accommodating at least the most important vehicles under cover. At present 50% of all preserved buses are stored in the open;
- the conservation of the most important vehicles, especially by private individuals, including workshops and secure weathertight accommodation;
- facilities for improved public access and education;
- improved co-ordination and representation of the category;
- an archive capable of receiving and eventually sifting collections of papers, ephemera and small artefacts which might otherwise disappear or be inaccessible to the public.

Railways

With over 400 miles of track, nearly 600 stations and about 150 locations around the country, heritage railways and the items in museums represent a big investment. With annual turnover in excess of £30 million and 8-9 million passengers a year, they form an important part of the leisure industry. Over 1,000 steam engines survive, though less than one fifth are at any one time operable due to the high cost of overhaul. Over 700 diesel locomotives and about 150 passenger units are in preservation together with a very small number of electric units. Over 3,000 passenger carriages and 2,500 freight vehicles are also in various states of conservation. There are over 20 cliff railways, mainly on the coast of England. The Heritage Railways Association provides advice to its members and a mouthpiece to the rest of the world.

The popularity of railways and in particular of steam propulsion, even among children, would suggest a bright future, provided the quality of the presentation and access to it can be maintained in competition with other attractions.

The key needs of the railways category are

- a grading system covering vehicles and whole railways would help to focus funding on the most worthy;
- safe access for the public to workshops and sheds would increase visitor appeal;
- covered accommodation for restoration work and carriage storage, not forgetting electric trains, would improve work quality and output and reduce deterioration;
- support for private enthusiast restoration projects including locomotive maintenance would be cost effective and increase capacity;
- enhanced visitor and educational facilities at stations would improve their educational role and raise the quality of the presentation to the public;
- archive storage would reduce the loss of priceless records.

Maritime (boats)

This diverse and scattered category is highly dependent on private individuals. Only canal and inland waterways craft have a degree of structure, largely because of their links with the waterways. Others such as fishing boats, lifeboats and traditional river craft are found all round the UK. In large museums smaller vessels often suffer from being overshadowed by larger ones and are inevitably seen as less important in terms of both management and public attention. They do however have strong cultural, emotional, regional and historical ties, as lifeboats, military boats, fishing boats or as the descendants of the earliest craft. The leisure associations of some motor and sailing boats appeal to yet other audiences. Steam has a strong following. Most boats are privately owned and the majority are sailable. They thus appeal to a wide public of both observers and participants, some of whom in pursuing their enthusiasms can afford to support the traditional boat-building skills.

There are probably about 500 small boats of serious historical importance, which should be preserved. Their interests are in the hands of a variety of 'umbrella' organisations. The National Maritime Museum is attempting to provide some degree of co-ordination. Their variety does not make it easy to classify or generalise but the following may be concluded from what emerges from the more detailed class analysis.

The key needs of the category are

- a common grading system across the category is needed in order to prioritise conservation efforts. This must take into account the NHSC cut-off points;
- about 500 small craft are probably of significant heritage importance and should be preserved. There are cases where modest supporting sums can help the conservation of important craft by private enthusiasts;
- revenue cost support for maintenance and rallying could in some cases be a means of keeping craft useable and enhancing public access;
- more training in traditional skills both at colleges and as apprenticeships appears to be needed, though further investigation as to how and where is required;
- the development of combined workshop, storage and public education facilities located at a few chosen sites (especially boatyards) to enhance public access and ensure enduring public support;
- a 'sink' or store for archive material;
- safe storage where boats at risk could be placed pending restoration would keep open the options between disposal and conservation for display.

Conclusions

1. Prioritisation across the categories should be actively encouraged, and its coordination funded. It will however have to be led. At this stage in the development of grading and listing the categories should apply whatever prioritising system seems most appropriate. Grading within categories and classes is the first priority. This should lead to improved co-operation between the private and public sectors of preservation.
2. All four categories would benefit from investment in the enabling of individually owned items to be assembled in secure storage, with workshop facilities, and enhanced public viewing facilities.
3. In all cases small grants to help enthusiastic private restorers would be likely to have a low cost/ high benefit ratio.
4. A common archive 'of last resort' should be encouraged with an emphasis in the first instance on physical storage rather than IT.
5. Consistent support of training and apprenticeships in traditional skills will be increasingly required. The skills need not all be narrowly based; for example railway carriages, bus bodies and boats have much in common, as do their internal combustion engines. This may best be aided by the stimulation of demand.
6. The more fragmented the category the more difficult but more important is the role of the umbrella organisation. Such organisations are critically important for the implementation of the measures recommended in this report.
7. Since transport is appreciated most when used and this leads to unique historical relics becoming worn by use, the role of the replica will become more important.

2 INTRODUCTION

In July 2000, the Heritage Lottery Fund (HLF) commissioned the Transport Trust as a neutral organisation concerned with all types of transport to carry out an assessment of the needs of four categories of transport heritage (aviation, buses and coaches, trains and railways, and smaller ships and boats). For the purposes of this study, heritage needs may be defined as “the extent to which physical assets which are of value to the heritage are at risk through possible destruction, deterioration, or disposal abroad, and the extent to which the public’s ability to appreciate its heritage is inadequate because of barriers to accessibility” (HLF Strategic Plan 1999-2002). In discussing the context of HLF’s grantmaking, the Strategic Plan notes that “no comprehensive needs assessment yet exists for the industrial, transport, and maritime sector.”

The transport sector touches people at many levels. In an age where more people travel than ever before, everyone has experience of transport. It has speed and movement, fine craftsmanship, and associations with earlier times. Steam propulsion has widespread appeal; transport impacts closely on social history, and its technology has been at the forefront of engineering. As a result it is estimated that audiences and participants in heritage transport activities exceed 15 million people a year - from sailors to cyclists, ralliers to researchers, and pilots to passengers. Thousands are content simply to stand and stare.

Britain has played a conspicuous and leading part in transport development which is deeply embedded in our heritage. Although there are rich collections of artefacts in public sector museums, private sector transport preservationists make a major contribution both to conservation and to the presentation of transport to the public.

The brief for this paper is set out in full in Appendix 1. In short it is to

- indicate the number of historically important items in the four selected categories (aviation, buses, railways, and boats);
- assess the needs of the categories in terms of conservation and infrastructure support;
- review the sustainability of public and enthusiast support;
- identify areas where public benefit can be obtained;
- consider the roles of museums and support organisations;
- examine the existence of archive facilities;
- review methods and progress on prioritisation.

There are five potential benefits from this report:

- a better understanding of what exists of historic interest in the transport sector across the country;
- a clearer view of where effort should be focussed to maximise sustainability;
- improved coordination between the private and public sector preservationists;
- a better understanding of the importance of the transport heritage;
- grant-making departments of government may be encouraged to co-ordinate their efforts.

Although there are major differences between the four categories under study, there are some striking similarities. The very mobility of transport places it at risk to export abroad, and deterioration by wear and weather. All categories benefit from both private and public expenditure. All struggle with inadequate finance. Boats and buses are largely privately owned; canals and railways have a big infrastructure (though this paper expressly excludes consideration of canal infrastructure). Most lack adequate mechanisms for preserving records and all share problems of accommodation and workshop facilities. All face the dilemma of balancing the establishment of displayable collections against the cost of high curatorial standards and the increasing pressures of health and safety. All have to reconcile the economies of scale with local loyalties and motivation. Some are struggling to find ways of prioritising without strife.

Given the time-frame the approach to the task has been top-down, by consultation with members of ‘umbrella’ organisations and with the major public and private transport museums and centres, by selective visits, by drawing on existing research, and by inspection. Military aviation and railway heritage are already well documented. Civil aviation, coaches, buses, and smaller boats are comparatively poorly documented. The treatment of each category, moreover, varies in response to its composition. Aircraft are divided by period, and between civil and military; coaches and buses are grouped together; railways and trains are discussed together under some topics, but not others; the different types of small boats are considered individually.

The contacts made during the research are listed in Appendix 2. The Glossary of Terms which follows explains words which occur in the text, but each category has a tendency to use terms in its own way and the reader is cautioned on the pit-falls in this area.

2.1 Glossary of Terms

The following terminology has been used:

benchmark (B).....	top grade used for aircraft, indicating historical importance
category.....	main group of transport such as railways, maritime etc.
class.....	a group of items with similarities of design, purpose and organisation
designated.....	the second level of grading by the NHSC, also nominated collections in non-national museums
grade.....	level of historical importance
listing.....	as with buildings, the setting of items in grades
look-alike.....	an aircraft with an external resemblance to the original but made with different techniques and materials, for instance a flying reconstruction of an early aircraft but with a modern engine system
mock-up.....	an aircraft scale model, sometimes even full-sized.
noteworthy (N).....	the third grade of historical importance for aircraft
original.....	an aircraft in original as-built configuration or as modified by the user. In this report the term is used to include restored originals and replicas or reproductions with some original parts.
register.....	an ungraded catalogue of items within a class or category

replica.....	a later imitation of an original; in the case of aircraft a reproduction by the original builder having the same engine and systems. In this report replica covers both reproduction and look-alike
reproduction.....	an aircraft which is a faithful facsimile in appearance and construction with substantially the same engine and systems as the original but built by a different manufacturer
restored original.....	an aircraft consisting of at least 50% original components, the remainder made from the same materials, components and accessories as the original. Where the percentage of original components is less than 50% (by surface area or volume) the aircraft is termed a 'replica' or 'reproduction with some original parts'.
significant (S).....	the second grade of historical importance for aircraft

2.2 Acronyms

The following abbreviations appear:

A/c.....	aircraft
AEW.....	airborne early warning
A/F.....	air force
AOP.....	air observation post
BAPC.....	British Aviation Preservation Council
BBMF.....	Battle of Britain Memorial Flight
BBPG.....	British Bus Preservation Group
BR.....	British Rail
BWB.....	British Waterways Board
CAA.....	Civil Aviation Authority
Fwd.....	forward
HNBOC.....	Historic Narrow Boat Owners' Club
HRA.....	Heritage Railways Association
IATM.....	International Association of Transport Museums
incl.....	includes
IWM.....	Imperial War Museum
LNER.....	London & North Eastern Railway
LNWR.....	London & North Western Railway
LSWR.....	London & South Western Railway
LT.....	London Transport
Mil.....	military
PRO.....	Public Record Office
PSV.....	Public Service Vehicle
NARTM.....	National Association of Road Transport Museums
NER.....	North Eastern Railway
NHSC.....	National Historic Ships Committee
NMM.....	National Maritime Museum
NRM.....	National Railway Museum
RAF.....	Royal Air Force
Restn.....	restoration
RFC.....	Royal Flying Corps
SBA.....	Steamboat Association

STOL..... short take-off and landing
TT..... The Transport Trust
TWT The Waterways Trust
U/c..... undercarriage
VTOL..... vertical take-off and landing

3 AVIATION

3.1 Scope of the Report.

This report should be read in conjunction with the first (May 1998) edition of the National Aviation Heritage Register (NAHR), published by the British Aviation Preservation Council. That report covers aircraft, including major components such as cockpit sections, in collections open to the public. The NAHR is therefore primarily a listing of museum airframes. A second, updated, edition with short sections on museum gliders and balloons is expected to be published shortly.

To minimise the level of duplication with the NAHR, this report will concentrate primarily upon complete civilian registered/private owned historic aircraft. A significant proportion of those aircraft are airworthy. This is very much in keeping with the philosophy of the Transport Trust which is that, as transport is fundamentally about movement, there is a presumption that a vehicle will be used. Static museum aircraft are not generally recorded in the Period Tables unless at least one privately owned or active example also exists in the United Kingdom. The Summary (Table 1) does include aircraft which, as no privately owned examples exist, only appear in the NAHR, in order to give an overall total for each period.

Certain classes of vehicles which normally fall within the aviation category have been excluded from this report on grounds of space and time. These include hovercraft, lighter than air (balloons and airships), non powered (gliders and sailplanes), microlight and ultralight aircraft. Although museum examples of certain categories will be covered in the second edition of the NAHR, privately owned aircraft will not be included.

The main sections have been divided up into the following periods:

- 3.6 Pioneer Period (Approximately 1903 to 1920)
- 3.7 Inter War Period (Approximately 1920 to 1938)
- 3.8 World War Two Period (Approximately 1938 to 1947)
- 3.9 Post War Period - General Aviation
- 3.10 Post War Period - Commercial (Approximately 1947 to date)
- 3.11 Post War Period - Military
- 3.12 Post War Period - Rotary Wing

Table 1, which follows overleaf, summarises the information contained in Tables 2 to 8. Also included, in order to provide a complete picture of total numbers of aircraft in preservation, Column E records the number of aircraft which only appear in the BAPC National Aviation Heritage Register since no example is preserved in the private sector. Column B records the total population from Tables 2 to 8 and the percentages in the 3 grades of B (Benchmark), S (Significant) and N (Noteworthy). It should be noted that these grades only relate to the historic importance of the type, not of an individual aircraft. The information in Column B from Tables 5, 6 and 8 includes large numbers of privately or commercially owned aircraft which, although potentially historic, are not yet regarded as such. A more accurate indication of the number of potentially preserved private aircraft is recorded in Column C. Column F is an assessment of historic aircraft preserved in one way or another. Column G is

similar to column F in most cases; where it differs it includes large numbers of aircraft which are known to exist but which are not in preservation.

Table 1. Summary of Total Aviation Sector

A	B	C	D	E	F	G	H
Period	Total from Tables and Grading Percentages	Total Private & Individual	Total Public & Trust	BAPC Register Total not in Tables	Totals Column C+D+E	Total overall Sector	% age of Column G airworthy
Pioneer (Table 2)	59 (26 replicas) 85%; S- 7%; C - 8%	12	47	14	73	73	23%
Inter-War (Table 3)	625 (2 replicas) B- 65%; S - 12%; C- 23%	561	64	20	645	645	45%
World War 2 (Table 4)	416 B -79%; S - 16%; N - 5%	288	128	59	475	475	36%
Post-War General Aviation (Table 5)	4429 (most are not considered historic) B -53%; S -38%; N -9%	435 (many in store)	44	4	483	4433	73%
Post-War Commercial (Table 6)	161 (most are still in commercial use) B - 71%; S -28% N- 1%	19 (most in store)	19	24	62	185	57%
Post-War Military (Table 7)	682 B - 49%; S - 40% N - 11%	392	290	100	782	782	26%
Post-War Rotary (Table 8)	510(most are not considered historic) B - 27%; S -49% N - 24%	92	115	51	258	561	31%
Sector Totals	6880	1797	709	272	2778	7154	59%

3.2 A Brief History of Aviation and British Aviation Preservation

Aviation in its powered, heavier-than-air form, is a wholly 20th Century phenomenon. Although balloons and airships are much older, the first controlled powered flight is acknowledged to be that by Wilbur and Orville Wright in December 1903 at Kitty Hawk, North Carolina, USA. Subsequently Europe led aviation development especially during the First World War. Following that conflict no continent had a totally dominant influence. Each nation developed its own aircraft and its pilots undertook record breaking and long distance flights. It is generally accepted, however, that during the late 1920s and 1930s Britain led the world in the development of light aviation. The products of the British light aircraft industry, especially those of the de Havilland company were widely used in long distance route proving linking the mother country to the nations of the British Empire and Commonwealth. The Second World War again provided a massive spur to all aspects of aviation development world-wide but particularly in the USA and Europe.

The British invention of the jet engine gave an initial post-war lead to the UK, especially in high speed commercial flight. Other significant early British innovations were the use of variable geometry (swing wing) for high speed flight, also the introduction of the steam catapult and angled flight deck for aircraft carriers. But the talent of the USA for mass production rapidly asserted its dominance in virtually every aspect of aviation. Europe frequently had technical equality or even superiority, but could rarely compete on economic grounds. Only when Europe began collaborative ventures could they begin to compete on cost. The Cold War provided a strong impetus to the development of military aircraft on both sides of the Iron Curtain. Mass production of such aircraft provided a ready source of airframes for preservation as each new technical advance made existing aircraft obsolete. These redundant aircraft provided the bulk of the stock for the rapid expansion of the British preservation movement in the 1960s to 1980s.

The history of British aviation preservation is almost as old as the science of flight itself. The first aeronautical collection in Britain was that of the Science Museum which started prior to the outbreak of the First World War. The foundation of the Imperial War Museum following that conflict led to a military based aviation collection. Between the wars, it was two individuals who led the way in aviation preservation. Richard Shuttleworth's private collection of old cars, bicycles and aircraft became part of the Shuttleworth Trust following his death during the Second World War. When, in the 1970s, the RAF Museum was finally found a permanent home at the historic airfield of Hendon, many of their earliest aircraft were formerly part of the private Nash Collection. Most of their World War Two aircraft had been in store at various RAF stations since the early 1950s. Apart from these collections, there was virtually no aviation preservation in the UK until the early 1960s.

The national interest in old aeroplanes was stimulated by the publication by the Merseyside Aviation Society in 1961 of the first edition of *Wrecks & Relics*. This was so successful that it became and still is a biennial production. Another important early recorder of old aeroplanes was Mr Leslie Hunt with a number of editions of his *Veteran and Vintage Aircraft of the World*.

The upsurge in interest in old aircraft led to the formation in the early 1960s of many of the now leading British aviation museums. In 1967, a handful of these collections, including the Fleet Air Arm Museum, got together to found what was then called the British Aircraft Preservation Council (BAPC). Linking national, local authority, independent and service museums with private collections, voluntary groups and other organisations in the advancement of aviation preservation, the BAPC has grown to over 130 member organisations, (there is no individual membership). In practice, the BAPC represents the non flying sector of British aviation preservation, as there are few member groups with airworthy exhibits.

Although there have always been wealthy individuals with private collections, the rapid growth of the private sector of aviation preservation from the 1970s has been fuelled by the escalating values of historic aircraft especially those from the Second World War period.

The importance of publishing in the development of aviation preservation should not be ignored. When, in 1973, the former weekly general aviation magazine, *the Aeroplane*, was re-launched as the *Aeroplane Monthly*, its subject matter was largely historical. The publication, in 1981, of the very successful *FlyPast* magazine was due in large part to its concentration on historic military aviation. In response, other longer established monthly aviation journals soon included a significant historical content. Today, some 2,000 aviation books are published annually in the UK, some are merely large format 'coffee table' photographic records but many are the result of dedicated research and soon became essential reference tools. For example, the embryonic interest in the history of military airfields was met, in 1979, by the ground breaking publication by Patrick Stephens Limited of the first of what became a ten volume series called *Action Stations*. A totally re-written, expanded version of that Volume One was published in 2000.

3.3 Airfields

Airworthy aircraft require an airfield and certain basic facilities. The earliest types need to operate from a suitable grass field but usually have no requirement for radio and air traffic control which would also be historically inappropriate. Since their cross-country capabilities are very limited, such flights are generally avoided. Aircraft of the Inter-war and Second World War periods also generally require a large grass airfield although some can manage with a hard runway. Ground based air traffic monitoring is usually a necessity. Most aircraft from the Post-War Period are designed to operate from runways.

In the south and south-east in particular, the availability of airfields of all types is very limited and the hangarage which is essential for virtually all aircraft will cost some £3,000 per annum for a small single-engined aircraft. The owner of the airfield will almost certainly demand third party insurance on top of this. Allied to the high cost of hangarage in the south-east is the pressure on land values caused by the demand for new housing and industry. Airfields are by definition a brownfield site. There is also a growing anti-aviation lobby, led in some cases by the local authority. These factors have severely restricted the use of or have even led to the closure of viable light aviation airfields. Another constraining factor, not only in the south-east, is the rapid expansion of commercial aviation and consequently the expansion of controlled

airspace. Historic aircraft of this period rarely have the sophisticated communications equipment necessary to operate in the controlled airspace environment.

Some airfields, recognising the threat to their existence from pressure groups, also industrial and housing developments, have sought to involve the public in their operation. An excellent example is the Northamptonshire grass airfield of Sywell. Reversing the trend of so many airfields in recent years, they have built a public viewing area, created a Friends organisation now with 1,300 members and an award winning journal, supported the establishment of a museum covering the airfield's long distinguished history by providing an appropriate Second World War building. Finally they have made the historic aircraft hangared on the airfield accessible by the means of conducted tours. Many other developments undoubtedly make Sywell one of the leading light airfields in the country. Hopefully others will follow their lead.

Non-flying aircraft are also best displayed in a hangar on an airfield. Sometimes this can be achieved on an active airfield but this presupposes that the commercial operation of the airfield is compatible with a static collection. The ideal solution is to combine the preservation of the airfield buildings and infrastructure with that of the airframes themselves. Rarely it is also possible to combine the preservation of the airfield with both static and flying collections. The best example of this is the Imperial War Museum's Duxford Airfield. This site also has the unique characteristic of having architecture from every period of British military airfield construction from 1917 to 1950s.

This report does not intend to cover the extensive subject of the preservation of airfields and the infrastructure which was essential to support the aircraft in their operational roles. However, it is worth noting that existing museums already preserve most features of British military airfields with the exception of a complete 1930s Expansion Period airfield (Duxford has some features of this period). It is understood that the listed Oxfordshire airfield at Bicester, which largely dates from this era, is being sold to a private aircraft collector. However, as with airframes, the neglected area is civil aviation. In recent years, this neglect is beginning to be addressed. The historically very important pre-war listed Terminal Building of the former Croydon Airport building has opened as a visitor centre and that at Liverpool Airport is being converted to alternative uses. However, many other architecturally and historically important civil airfield buildings are still under threat.

3.4 Prioritisation

The story of the prioritisation of historic airframes can be traced back to a programme by the Royal Aeronautical Society after the Second World War, when they affixed small brass plaques to a selection of surviving pioneer aircraft. In the early 1980s, the then Chairman of the BAPC, Douglas Harmer requested suggestions for more recent UK aircraft which should be preserved for posterity. On his premature death, this programme was taken up by John Bagley. Finally, a document called *Priorities for Preservation- A National Listing of Historic Aircraft* was published by the BAPC in 1994 for internal consultation. As it says, it was a list of the individual aircraft considered to merit permanent preservation. Only those achieving the highest grade were considered and many potentially historic airframes of a marginally lower grade were omitted. In addition, only two of each type were listed. Also, not unnaturally, virtually all the aircraft listed were in the collections of the major museums.

To address these problems a different, more inclusive, approach was adopted. Through the work of the National Aviation Heritage Committee, formed as a sub-committee of the BAPC Executive Committee, the first draft of the National Aviation Heritage Register was produced in the Council's 30th anniversary year, 1997. Sub-titled *An audit of preserved airframes held in museums within the UK*, the first draft was only issued to BAPC member groups for consultation. Edited by Ken Ellis, this was the first ever attempt to survey and prioritise most of the aircraft on public display within the UK. Points were allocated for various criteria, such as world, national, technical, regional and social significance. The condition (originality) was considered, as was the display environment. Aircraft gaining 7 or more points were classified 'Benchmark'. The grade 'Significant' was awarded to those scoring more than 4 points with those having less labeled as 'Noteworthy'. In the first draft, aircraft which flew were considered to be lower down the pecking order than similar-scoring ground-based aircraft. Also those airframes considered to be a replica were not included. After consultation, the first edition of the National Aviation Heritage Register was published in May 1998.

3.5 Summary of Category Needs

Overall British Aviation Preservation is in a healthy state and although the expansion of the 1970s and 1980s has slowed significantly, the sector continues to thrive. The movement is still divided between those who fly their aircraft and those who don't, although the Imperial War Museum at Duxford have shown that co-operation provides significant mutual benefit. The continuing area of neglect is civil aviation, in particular General Aviation since the end of the Second World War. Although there are significant airliners which are yet to enter preservation, most of the more important post-war airliners are in 3 major UK collections. These are the Science Museum's collection stored under cover at Wroughton in Wiltshire, the British Airways collection at RAF Museum, Cosford near Wolverhampton and the Duxford Aviation Society collection displayed at the Imperial War Museum, Duxford near Cambridge. The major problem facing the latter two collections is that of external display and the inevitable corrosion which follows.

The high level of public interest in aviation and air displays is seldom acknowledged. However, in 1995 following a Government request, the Royal Air Force in conjunction with the then Air Display Association conducted a survey of all the military and civilian events which took place in that year. Although the number of purely historic airshows were few, virtually all had some historic aviation content. The results indicated that airshows attract audiences totaling 6.5 million annually. The survey was primarily concerned with practical matters of interest to the Royal Air Force and Air Show Organisers such as display content, site facilities etc. The peripheral audience from sources such as video sales, television programmes, local radio and newspapers was not quantified.

The key needs of the aviation category are

- prioritisation. The individual aircraft grading adopted by the BAPC should be extended to include the privately owned historic aircraft although it may not be easy to persuade the owners to co-operate;
- hangarage. More covered accommodation should be provided for the highest and middle graded aircraft in preservation;

- the preservation of civil aviation. A strategy is required for the acquisition, conservation and accommodation of important commercial and light aircraft and their supporting infrastructure;
- skills training. A programme of identifying the gaps in conservation skills is being conducted by the BAPC. When completed could be the basis of a skills training programme;
- operators of unique airworthy Benchmark aircraft should be encouraged to consider the construction of a look-alike replica and to grounding the original.

3.6 Pioneer Period

Basic Details

This section consists of aircraft from the Pioneer Period (approximately 1903 to 1920). Table 2 records 59 machines of which 33 are original or largely so. The remaining 26 are replicas, many of which are either airworthy or have flown. A further 14 original aircraft appear in the BAPC Register giving an overall population of 73.

With just 47 original aircraft, the justification for replicas (or more accurately reproductions) is therefore strongest in this section. Airframes of this period, whether original or replica, are predominately in public or trust collections (84% of the total, including the BAPC Register airframes), although a few of these are on loan from private individuals. Of the seventeen airworthy aircraft, over half are original, the majority being in the care of the Shuttleworth Collection, which is based on Old Warden airfield near Biggleswade, Bedfordshire. With such a high percentage of this section being preserved in public collections, the infrastructure is largely that of the national museums

Physical Needs

Aircraft of this period range from the very flimsy, marginally flyable machines from the birth of powered aviation to the very practical military aircraft built at the end of the First World War. However, whether original or replica, they are all fabric covered, many of timber construction and inherently very vulnerable to the elements. Heated hangarage is an absolute minimum requirement; preferably the environment should be both temperature and humidity controlled.

Conservation/restoration of aircraft from the birth of aviation requires materials which are very low technology but are usually in short supply. The fabric covering of either Grade A Cotton or Irish Linen becomes more difficult to obtain every year as more fabric covered aircraft move to the synthetic equivalents. Appropriate wood to repair a timber frame 80 or more years old is similarly very difficult to find. The additional myriad of materials like varnishes, dopes, also components like nails and screws are very specialist items. The list is endless and beyond the scope of this report. For a detailed authoritative description of the conservation of aircraft of this period, reference should be made to *Restoring Museum Aircraft* by Robert Mikesch, former Senior Curator of the Washington National Air & Space Museum. Operation of aircraft of this period requires a grass airfield and they are all vulnerable to adverse weather conditions especially winds. Long distance cross-country flights by machines in this category are inherently risky and not generally undertaken. The operation of such aircraft, therefore, is only really practical if the machine is based on an appropriate field.

Documentation

The documentation of individual aircraft is generally good. Most of those in the major national collections are well documented, having been part of the collection for many decades. This is also generally true of those in flying condition as full documentation is an integral requirement of a Civil Aviation Authority (CAA) licence. Those replicas built in the last 30 years are also well documented. If there is a problem area, it is with the aircraft being restored from limited original components, often to flying status. The provenance of these original parts can be somewhat difficult to ascertain.

Archives associated with aircraft of this period are largely in the hands of the national museums. There are enthusiastic amateur and professional individuals involved in research associated with this period, especially the First World War. A self-help group of enthusiasts specialising in the First World War are Cross and Cockade International. Another international organisation was founded in 1961 to bring

together builders, restorers, collectors, museums and historians with an interest in the period 1900 to 1920. Based in the USA, they publish a regular journal called *WWI Aero*.

Human Resources

The conservation skills associated with aircraft of this period are now very specialised including the repair/replacement of aircraft timber structures or the replacement of linen or cotton fabric with associated dope tautening techniques. Formal training courses in these skills are non-existent. Similarly, knowledge of the operation/maintenance and repair of the aero engines of this period is restricted to a very small number of organisations. Predominant amongst these is the Shuttleworth Collection. Although primarily there to maintain its own aircraft, the small technical workforce do, when resources permit, assist other organisations and private individuals - at a commercial rate. Unlike other categories, the small numbers involved and very specialist nature of the aero engines (many are of the rotary type which ceased to be produced shortly after the end of the First World War), mean that there are virtually no commercial companies involved in restoration of aircraft of this period. The Shuttleworth Collection has the support of a large group of hard-working enthusiasts, the Shuttleworth Veteran Aeroplane Society. However because of the degree of hand skills involved in work on aircraft of this period, the opportunities of using volunteer labour is rather limited in organisations other than Shuttleworth. The operation of aircraft of this period require piloting skills of a very high standard, not only because of the rarity and value of the aircraft but also because the controllability of many are definitely in the difficult class. Very few pilots are permitted to fly these machines unless they have a military test pilot background.

Public access

The predominance of the public collections and national museums in this category means that public access is normally automatic. In addition, since the airfield requirements for aircraft of this period are so exacting, many privately owned airframes tend to become based upon the airfields of public museums under loan or other agreements. The education role of replica or look-alike aircraft is of great importance. Since many of the original machines are unique, flying them, however responsibly carried out, does incur some degree of risk of loss or severe damage. This risk is exacerbated by the often marginal flying qualities of the early aircraft.

The construction of a visually identical machine, often with a modern engine and control systems permits the regular demonstration of flying from the dawn of aviation. Although the Shuttleworth Collection possesses two aircraft in this category (both constructed for a movie), to date no aircraft has been specifically built for this purpose. Both the Shuttleworth aircraft were originally constructed for a movie. However, the risk of permanent loss of irreplaceable original machines means that look-alike replicas should be built for demonstration purposes, permitting the original airframes to be available for close public scrutiny of the construction techniques and materials. Replicas have been commissioned by the RAF Museum to fill significant gaps in their collection. These were built to original specifications and flown before being permanently grounded for public display.

ICT is growing in importance, especially in the major and national collections. Virtually all have excellent web sites and more of their collections are becoming accessible via these sites.

Funding

The funding of public/national museums is largely a matter of political will and outside the scope of this report. Collections like Shuttleworth, being part of a larger Trust, are subject to the overriding needs of that Trust. Financial difficulties which have beset the Shuttleworth Trust for many decades, have resulted in the sale of aircraft from the collection. In recent years, stricter financial management appears to be putting the overall Trust on a sounder economic basis although during the preparation of this report 3 aircraft have been sold, apparently to rationalise the collection.

Prioritisation

Apart from this report, the BAPC National Aviation Heritage Register is the only attempt at prioritisation of this category. The age and unique status of the majority of original airframes automatically place virtually all into the highest grade. The only exceptions are those built as look-alike replicas which do not appear in the NAHR. However a more rigorous application of the IATM definitions (See 2.1 Glossary) would certainly move many airframes currently assessed as Original into the Restored Original and often into the Reproduction or Replica with Original Parts categories.

Table 2. Pioneer Period

Manufacturer	Type	Description	Grade	Approx. No. Extant in UK	% air worthy	No. in Private & Individual Collections	No. in Public & Trust Collections
Avro	504	Conceived in 1913, originally as a bomber, most widely used as a trainer. 8,000+ built	B	8	12%	1	7 (3 replicas)
Blackburn	1911 Mercury Monoplane	3 rd Blackburn design, 9 built during 1911/12.	N	1	0%	0	1 (replica)
Blackburn	1912 Monoplane	Earliest surviving, largely original, example of a Blackburn a/c	B	1	100%	0	1
Bleriot	monoplanes, type XI, etc.	1909 design by Louis Bleriot, made first cross channel flight. Includes contemporary Bleriot & other developments	B	6	33%	2 (both replicas)	4
Bristol	1910 Biplane Boxkite	Successful early trainer- based on Farman design. Used by military & civilian schools in UK & overseas	S	2	50%	0	2 (both replicas)
Bristol	F.2.B Fighter	1917 2 seat fighter, serving with RAF until 1930s, 5000+ built	B	5	40%	2 (restorations)	3
Bristol	M.1.C Scout	Advanced single seat monoplane fighter, 100+ built from 1917	S	2	50%	0	2 (both replicas)
Curtiss	JN-4 Jenny	US WW1 trainer and inter-war barnstormer a/c. 2500+ built	B	1	100%	1	0
Deperdussin	1910 Monoplane	Successful trainer used by military & civil operators	B	1	100%	0	1
Fokker	DR.1 Triplane	Triplane single seat fighter, made famous by Baron von Richthofen	N	2	0	1 (replica)	1 (replica)

Manufacturer	Type	Description	Grade	Approx. No. Extant in UK	% air worthy	No. in Private & Individual Collections	No. in Public & Trust Collections
Fokker	E.III	Monoplane German fighter with revolutionary gun installation	B	2	50%	1 (replica)	1
Morane-Saulnier	Type N Bullet	French monoplane single-seat fighter from 1914. Revolutionary fwd-firing gun. Also used by RFC.	N	1	0%	1 (replica)	0
Roe	Triplane	Earliest successful UK a/c. A series of 11 built 1909/1910	B	3	33%	0	3 (2 replicas)
Royal Aircraft Factory	BE.2	2 seat observation a/c, first flight in 1912. BE.2C appeared in 1914. BE.2 served to end of WW1	B	4	0%	1 (rebuild for flight)	3 (1 replica)
Royal Aircraft Factory	SE.5	Outstanding single seat fighter, 5000+ built from 1916.	B	5	20%	0	5 (2 replicas)
Sopwith	Pup/Dove	WW1 single seat biplane fighter, in service with RFC/RAF 1916-18.	B	4	25%	0	4 - incl. 1 on loan (3 replicas)
Sopwith	Triplane	Agile single seat fighter used by RNAS from 1917.	B	4	50%	1 (replica)	3 (2 replicas)
Sopwith	Camel	Renowned single seat fighter from 1917, nearly 6000 built	B	6	17%	1 (replica)	5 (3 replicas)
Wallbro	Monoplane	Flown replica of advanced design built by Wallis brothers in 1910	N	1	0%	0	1 on loan (replica)
TOTALS			B-85% S-7% N-8%	59	29%	12	47

3.7 The Inter War Period

Basic Details

This section consists of aircraft from the inter-war period (approximately 1920 to 1938), totaling more than 620 airframes or major components. There are just two replicas, although a strong case could be made for the building of replicas of important types, like the Handley Page HP 42 biplane airliner which are now extinct. In addition there are a further 20 original airframes recorded in the BAPC Register. Approximately 290 are currently in flying order, over 45% of the total. The majority of types survive as a handful or more often as single examples. The total is distorted by large numbers of three types, the de Havilland Tiger Moth with more than 200 aircraft, the Piper Cub with over 100 examples, and over 90 Luscombe Silvaires. The Tiger Moth and Cub were built in large numbers for military use during the Second World War and the majority of the surviving aircraft are from that period rather than pre-war production. Silvaire manufacture in the USA was divided between pre- and post-war production and those on the UK civil register are similarly divided. Large scale wartime production is also true, to a lesser extent, of the de Havilland Dragon Rapide (called Dominie in RAF service) and the Miles Hawk Trainer 3 (RAF Magister). Ownership is overwhelmingly in the private sector - over 550 of the total with a further 23 either owned by or on loan to the Shuttleworth Collection. The category has the support of a large body of enthusiasts, many of whom are neither pilots nor owners

Physical Needs

Aircraft of this vintage, being largely fabric covered, require hangarage as protection from the elements, especially wind and rain. This is an expensive item. Restoration and conservation/ maintenance of such aircraft requires skilled labour. Unlike most other transport categories, work on aircraft is tightly regulated by the CAA.

Although a competent owner can undertake basic maintenance, every action has to be certified by an engineer holding appropriate CAA licences. More extensive work can only be undertaken at an approved facility by licensed personnel. The number of organisations catering for historic aircraft is limited and staff numbers are invariably small (half a dozen or so). This means that there is always a backlog of work, although the workload and workforce appear to be generally in balance.

Documentation

The level of documentation of this category is generally very good. The requirement that all flying machines are individually identified and licensed means that their histories and status can be researched. Historians, both amateur and professional, have access to reference books which are updated annually to record all currently registered aircraft. Many of these are published by Air Britain (Historians) Ltd. From other sources of reference, the researcher can identify other airframes which are no longer airworthy. Virtually all the information contained in the table came from published reference sources.

The area where documentation is very variable is that of a technical nature. The operation and especially the restoration of an aircraft requires a high level of original manufacturers' documentation. The availability of these drawings and material specifications is very fragmented. Sadly much of this technical information is regarded as aviation memorabilia and is very collectable. As there is no central archive for such material, much has found its way into private hands and is virtually lost. Occasionally archive material resurfaces: recently, through the auspices of the BAPC, archive material dating from 1916 to 1928 relating to Nieuport & General Aircraft was purchased by the RAF Museum. Other museums hold similar archives but the degree of access for research is very variable.

Research into historic aviation is on-going. Air Britain's members research and publish a number of specialist reference books on a wide range of topics, including civil aviation.

Human Resources

The skills necessary for the conservation of historic aircraft include many for which formal training no longer exists. Replacing or even repairing fabric covering, whether the historically correct Irish linen, Grade A cotton or the more durable modern synthetic material is a craft skill. Similarly, working on wooden structured aircraft requires more than a knowledge of basic carpentry.

There are a small but growing number of professional aircraft restoration companies, covering not only the airframes but also the repair of the original engines. All aspects of an aircraft are subject to regular inspection and replacement, either on condition or after a certain period of operation (fatigue life). This is especially true of an aero engine which is normally only approved for a specific number of flying hours. This is naturally a very expensive regular expenditure for any owner of an historic aircraft, especially as all such work has to be undertaken by licensed engineers

The skills required for repair or restoration are generally acquired by observing existing craftsmen, the knowledge handed down from generation to generation. However, in order to inspect or approve the work on an historic aircraft, the engineer has to hold appropriate licences from the CAA. Generally it will take at least five years for an engineer to get the necessary experience and pass the appropriate examinations.

Few museums have a role in this sector, predominately because of the need for personnel to be licensed. The exception is the Shuttleworth Collection, (see the Pioneer Section). Other museums, such as the IWM at Duxford, also allow appropriate airworthy aircraft on their site. However the predominate human resource in this sector is the enthusiastic private owner who often makes great financial sacrifices to keep his aircraft in the air.

The role of the volunteer is limited by the need for skills and licensed supervision. These are therefore most often retired personnel. Getting younger people involved is very difficult. Apart from their reluctance to leave their computer screens to get their hands dirty, problems include health & safety and insurance cover. Many of the present generation of engineers obtained their initial experience by volunteering to

undertake almost any task at their local airfield, just to be with aeroplanes. That is generally no longer possible.

Where sufficient aircraft of one type or from one manufacturer remain, mutual support organisations have evolved. The most active in this group is that supporting de Havilland aircraft, the DH Moth Club. In addition to providing mutual assistance, the Moth Club has arranged for scarce items to be manufactured in bulk. Recently they have also set up a company to accept the design authority for DH types delegated to it from the de Havilland successor company, BAE SYSTEMS. Another support group for a specific manufacturer is that for Miles Aircraft. The umbrella organisation for aircraft which qualify as home-built is the Popular Flying Association (PFA). The CAA delegates much of the operation of the Permit to Fly licensing to this organisation. It is worth noting that the annual cost of a Permit to Fly is less than that of a full Certificate of Airworthiness. However since most of the aircraft in the Inter-War category predate the adoption of the Permit system, the CAA requires that, where feasible, they continue to use the original licensing. As virtually all the aircraft of this period use the tailwheel configuration, piloting skills have to include the very different technique involved in the landing and take-off phases of flight from that of nose wheel machines. European legislation is beginning to be enacted to ensure that a pilot has the necessary endorsement to his licence before being allowed to fly a tailwheel aircraft.

Support from associated organisations is limited. Some sponsorship has been obtained from insurance and photographic companies in exchange for publicity. The Transport Trust has also given some financial support to specific projects, albeit in small amounts reflecting the limited resources of the organisation. Reference has already been made to clubs which support types or manufacturers. In addition to these there are groups which seek to aid aviation in general. These include: The Air League; AOPA (Association of Aircraft Owners and Pilots); Aviation in the Community; General Aviation Awareness Council; Strategic Aviation Special Interest Group; Royal Aero Club and the Royal Aeronautical Society; Other bodies cater for more specific interests, many of which are not strictly relevant to historic aviation. These include: British Aerobatic Association; British Women Pilots Association; Flying Farmers Association; Historic Aircraft Association; Helicopter Club of Great Britain and the Lawyers Flying Association.

Public Access

Only 10% of aircraft in this group are in collections open to the public and thus normally accessible to the public on a regular basis. For the remainder, being privately owned, public access is generally limited to viewing at public airshows and rallies. The larger air events do not cater for this type of historic aeroplane but there are some which do. The largest is the PFA Rally, although this event is primarily aimed at homebuilt types. One event which over the past 5 years has specialised in this category is the Great Vintage Flying Weekend held at different venues each year. This rally, which has grown in support each year, attracts a wide range of historic light aircraft and enthusiasts. It is organised, very much as a labour of love, by a small publishing company, Cirrus Associates.

The largest collection in this category, the Shuttleworth Trust, holds some dozen flying events over the season displaying its own aircraft and others from private collections. Visiting machines, if appropriate, are often put on static display. The display of aircraft in the air is, like everything associated with aviation, controlled by the Civil Aviation Authority. In this case it is the pilot who has to hold a suitable Display Authorisation (DA) to perform in front of the public. There is considerable potential for encouraging more public interaction with light aviation especially historic aviation. Apart from the museums involved in this category, few individual owners have made use of the educational opportunities which their aircraft present. However many of the support organisations, like the PFA and the Moth Club, have educational programmes to encourage the participation of younger members. We are not aware of any formal links to local authority education departments outside the established museums. Again, with the exception of major museums, the role of ICT is very limited.

Funding

Funding for this category is wholly private, with some sponsorship of events and individual aircraft/ formations. Where sponsorship has been obtained, it has been solely for exhibition not restoration. The only significant exception to this has come from the Transport Trust Award, but again these are relatively small sums. The continuation of most of the aircraft in this group relies on the owner's wealth and dedication. As we have seen, operating an historic aeroplane is an expensive hobby, the costs of which can only be recouped when the (hopefully) appreciating asset is sold. Sadly overseas buyers, especially in the USA, often have deeper pockets than potential British owners. Having said that, the trend in Britain over recent years has been to a net gain in historic airframes, although this has been primarily in aircraft from the Second World War period.

Prioritisation

To date, with the exception of the rough indication of historic merit included in this report, there is no scheme which prioritises privately owned historic aircraft. Similarly no assessment of needs exists other than this document. The excellent BAPC National Aviation Heritage Register does assess the relative merits of museum aircraft, including those of the Shuttleworth Collection, and does assess individual airframes. For a more considered judgement on the historic importance of the bulk of the aircraft in private ownership, a more detailed individual review will be necessary. By definition, the most important criteria for a flying aircraft is that the work shall ensure the machine is airworthy, historical authenticity is a secondary consideration. Thus most currently airworthy historic light aircraft have, over the years, either been rebuilt or had many parts replaced, possibly compromising their historical value. A good example is the historically very important Percival Mew Gull. This machine has been virtually totally rebuilt on at least two occasions, maybe more. This raises the question of replicas, a topic which is discussed in the Review of Issues (7.6) and in the Glossary of Terms (2.1).

Table 3. Inter-war Period

Manufacturer	Type	Description	Grade	Approx. No. Extant in UK	% air worthy	No. in Private & Individual Collections	No. in Public & Trust Collections
Aeronca	C-3/ 100	Originally a US design for a cheap light a/c. 20+ built in UK during 1930s	N	7	60%	7	0
A.N.E.C	II.	3 built for 1924 Lympne 2 seat light Aeroplane trials	N	1	being restored	0	1
Arrow	Active II	Designed in early 1930s as an advanced trainer, only 2 built.	N	1	100%	0	1 (on loan)
Avro	Avian	Successful UK light a/c, 150 + built in 1920/1930s	B	2	0%	1 Being rebuilt	1
Avro	Tutor	Military 2 seat trainer, over 700 built for RAF & other air arms	S	1	100%	0	1
Beech	17 Traveler Staggerwing	First Beech design, 5 seater from early 1930s, 700+ built for civil & military use.	S	4	75%	4	0
Blackburn	B-2	All metal 2seat biplane trainer, 42 were built in 1930s for RAF reserve training schools	S	3 (2 parts only)	33%	3	0
Blake	Blue Tit	Remarkable one-off 1930 homebuilt	N	1	being rebuilt	1	0
British Aircraft, incl. Br. Klemm	Swallow I & II	Original German design, 130 + UK versions built during 1930s	S	8	60%	8	0
British Aircraft	Eagle II	Very advanced retractable u/c 3 seat monoplane, 43 built in 1930s.	S	1	100%	1	0
B A C	Drone	33 of these single seat motor-glidlers were built in 1930s	N	2	0%	1	1
Cessna	C.165 Airmaster	More the 180 Airmasters were built in the USA between 1935 & 1941	N	1	100%	1	0
Chilton	D W.1	Remarkable high performance single-seat monoplane of late 30s	N	4	25%	4 (only 1 complete)	0

Manufacturer	Type	Description	Grade	Approx. No. Extant in UK	% air worthy	No. in Private & Individual Collections	No. in Public & Trust Collections
Chrislea	LC.1 Airguard	Advanced monoplane all wooden trainer. Only 1 built	N	1	0%	1	0
Civilian	coupe	High wing cabin monoplane from early 1930s, 5 built	N	1	100%	1	0
Comper	Swift	Late 1920s UK sporting monoplane, racing and record breaker.	B	4 - incl. 1 replica	50%	3	1
Curtiss	C.2 Robin	Late 1920 US design, 3 or 4 seat high wing cabin monoplane	N	2	100%	2	0
Curtiss-Wright	Travel Air CW-12Q	Designed in 1930 as a 2 seat biplane trainer	N	1	0%	1	0
Dart	Kitten	Attractive single-seat monoplane from late 1930s, 2 built.	N	1	100%	1	0
de Havilland	DH 51	First attempt by DH to build a practical private a/c	B	1	100%	0	1
de Havilland	DH 53 Humming Bird	Ultra-light a/c designed for the 1923 Lympne a/c trials	S	2	50%	1	1
de Havilland	DH 60 Moth & Moth Major	From 1925 the most successful UK pre-war light a/c. 1200+ built for training & touring	B	27	50%	23	4
de Havilland	DH 80 Puss Moth	Successful cabin touring high wing monoplane, 259 built in 1930s	S	4	50%	3	1 (on loan)
de Havilland	DH 82A Tiger Moth	First flown in 1931 as a tourer/trainer but most survivors are from the 8,000+ military production	B	200+	50%	192 +	8
de Havilland	DH 82B Queen Bee	Remotely controlled target a/c, initially used by RN	S	2	50%	1	1
De Havilland	DH 83 Fox Moth	Unusual 4 passenger + pilot cabin monoplane, 100+ built in 1930s	S	3	67%	3	0
de Havilland	DH 84 Dragon & DH 89 Dragon Rapide	The Dragon and its successor, the Dragon Rapide were very successful twin engine biplane airliners. Military use also	B	20	35%	15 (some parts only)	7 (incl. 1 on loan)
de Havilland	DH 85 Leopard Moth	1930s 3 seat VIP tourer	S	3	66%	3	0
de Havilland	DH 87 Hornet Moth	Mid 1930s 2 seat cabin tourer	S	15	70%	13	2
de Havilland	DH 88 Comet	Specialist racer designed for 1934 UK- Australia race	B	2	50%	1 being rebuilt	1
de Havilland	DH 90 Dragonfly	Luxurious 5 seat executive biplane, 66 were built from 1935	S	1	100%	1	0
de Havilland	DH 94 Moth Minor	Late 1930s 2 seat monoplane trainer	S	6	33%	5	1
Dewoitine	D.26	French single seat fighter trainer from 1927. 11 built for Swiss A/F	N	1	100%	1	0

Manufacturer	Type	Description	Grade	Approx. No. Extant in UK	% air worthy	No. in Private & Individual Collections	No. in Public & Trust Collections
Desoutter	Monoplane	British version of a Dutch designed 3 seat cabin a/c, 41 built in 1930s.	S	1	100%	0	1
English Electric	Wren	Single-seat ultra-light built for 1923 Lympne Trials	S	1	100%	0	1
Foster Wikner	Wicko	Wooden high wing monoplane, 11 built in late 1930s	S	1	0%	1	0
Granger	Archaeopteryx	Home-built, swept wing tailless ultra-light design built in 1930.	N	1	0%	0	1
Great Lakes	2T-1Sport Trainer	US 2 seat biplane built in large numbers 1929-1932	N	2	100%	2	0
Hawker	Cygnet	Entry for the 1923 Lympne Light Aeroplane trials	N	2 1 replica	50%	1	1
Hawker	Tomtit	Biplane trainer, 36 built for the RAF from 1928. Also civilian use.	S	1	100%	0	1
Hawker	Fury	Revolutionary high speed biplane fighter used by RAF & other airforces	S	1 fuselage only	0%	1	0
Hawker	Audax/Demon Hart/Hind Nimrod series	Series of advanced single & 2 seat military biplanes used by the RAF & RN as fighters, bombers, trainers and army co-operation	B	8	25% to date	4	4
Heath	Parasol	American designed home-built, one constructed in UK in 1939.	N	1	0%	1	0
Luscombe	8 Silvaire	All metal side-by-side 2 seat monoplane from 1937. 1000+ built pre-war, 2000+ post-war. Imported as affordable classic US light a/c	N	80+	80%	7+	0
Martin	Monoplane	1930s amateur a/c used wings from a DH53 & fuselage from another home-built	N	1	0%	1 (parts only)	0
Mignet	HM.14 Pou-du-Ciel	Designed for home construction, many thousands were built worldwide, including 400 in UK	B	20+	0%	10+	10
Miles	M.2 Hawk & M.2L Hawk Speed Six	The M.2 was the first production Miles a/c. the L version is a special single seat racer.	B	2	50%	1	1
Miles	M.3 Falcon	Record breaking 4 seat development of the M.2	S	1	100%	1	0
Miles	M.5 Sparrowhawk	Racing single-seat monoplane, 6 built in mid 1930s	N	1	Being rebuilt	1	0
Miles	M.11, 12 & 17	Successful series of advanced pre-war cabin monoplanes	S	6	17%	5	1
Miles	M.14 Hawk Trainer 3	Derived from the M.2, the M.14 was used by pre-war flying clubs and, as the Magister, by the RAF (1300 built)	B	9	33%	7	2

Manufacturer	Type	Description	Grade	Approx. No. Extant in UK	% air worthy	No. in Private & Individual Collections	No. in Public & Trust Collections
Mosscraft	MA 1 & 2	Low wing 2 seat monoplanes, only 1 completed before WW2	N	2	0%	2 (parts only)	0
Parnall	Pixie III	Competitor in the 1924 Lympne Light Aeroplane Trial	N	1	0%	0	1 (parts only)
Parnall	Elf	1930s 3 seat tourer, 3 built	S	1	100%	0	1
Percival	P.6 Mew Gull	Racing and record breaking monoplane. 6 were built	B	1	100%	0	1 (on loan)
Percival	P.10 Vega Gull	The final 4 seat version of the Gull series, 90 were built in late 1930s	B	1	100%	1	0
Percival	Q. Six	Designed in late 1930s as a fast, twin engined 5 seat airliner, 27 built	S	1	Being rebuilt	1	0
Piper	J/2 & J/3 Cub	Very successful pre-war light a/c which was also built in great numbers as the L-4 during WW2	B	100+ incl. Ex Military	85%	100+	0
Piper	J/4 Cub Coupe	2 seat side-by-side monoplane, 1250 built from 1939-1942	N	6	50%	6	0
Piper	J/5 Cub Cruiser	3 seat high wing monoplane, 800+ built from 1940. Production post -war as PA-12 Super Cruiser	N	6	50%	6	0
Rearwin	Cloudster, Skyranger, Sportster	Series of tandem 2/3 seat high wing monoplanes built from 1935.	N	6	17%	6	0
Robinson	Redwing	First flown in 1930, 12 were built as 2 seat trainers	N	1	0%	1	0
Short	S.16 Scion	Small 1930s airliner of which 19 were built.	S	2	0%	1- Fuselage frame only	1
Southern	Martlet	A single-seat biplane, 6 built by a predecessor of Miles Aircraft.	N	1	Being rebuilt	0	1
Spartan	Arrow	Competent all wooden biplane of 1930s, 28 were built	N	1	100%	1	0
Spartan	Cruiser	Advanced 3 engined 10 seat mono Plane, 16 were built	S	1	0%	0	1 (incomplete)
Surrey Flying Services	AL.1	2 seat wooden trainer built in 1929 by a Croydon based flying school.	N	1	0%	1	0
Taylorcraft (UK)	Plus C/D	UK version of US 2 seat high wing design. Adopted as WW2 Air Observation Post,	S	8	38%	7	1
Taylor-Watkinson	Ding-Bat	Sole example of an aerobatic single seat monoplane	N	1	0%	1	0
Tipsy	B/ Trainer/ Belfair	Originally a Belgian 2 seat design, some 15 were built pre-war, others including the Belfair, post-war.	N	7	50%	7	0
Waco	UPF-7 & YKS-7	1930s 2/3 seat cabin & open biplane.	N	2	50%	2	0
Wheeler	Slymph	Home designed & built single-seat monoplane, never flown	N	1	0%	0	1 (on loan)
TOTALS			B-65% S-12% N-23%	625	46%	561	64

3.8 World War Two Period

Basic Details

This category consists of aircraft used during the Second World War (approximately 1938 to 1947). The following table of privately and publicly owned airframes details in excess of 410, of which nearly 290 are in private or individual collections. A further 59 aeroplanes are recorded in the BAPC NAH Register, all in public collections. Many of these are unique and of great historical importance. However, approximately 60% of the UK population of World War II aircraft are in private ownership. The percentage able to fly is 36%, just over 170 aeroplanes, the majority of which are in private hands. The main exceptions are those in the care of the military historic flights, whose aircraft mainly retain their military identities and are not on the civil aircraft register. The high percentage of both privately owned and airworthy machines reflects the high value placed on many aeroplanes from this period. (An airworthy late mark Spitfire was recently offered for sale at a sum in excess of £1m; the value of a flying example of a wartime Tiger Moth can be up to £50,000.) Therefore public collections are virtually priced out of the market on the rare occasions that complete aircraft of this period become available.

As with the inter-war sector, most types are preserved as single items or in very small numbers. There are exceptions, notably the Supermarine Spitfire with in excess of 50 airframes extant in the UK. Its Battle of Britain contemporary, the Hawker Hurricane, was relatively rare until the early 1990s. The ending of the Cold War allowed the importation of crashed examples found in the relatively inaccessible areas of Russia. More than 50 of the British army's Auster Air Observation Post type survive mainly because they were converted post-war for civilian use. Similarly, Britain has more than 35 examples of the Boeing Stearman Kaydet because the type found a post-war role in the USA as a crop-sprayer before being recognised as historically important. Others available in relatively large numbers include the Douglas DC-3/ C-47 (many of which are still in commercial use) the North American Texan/Harvard, and from the same company, the P-51 Mustang.

Physical Needs

The requirements for hangarage and good environmental conditions apply equally to aircraft in this category as in the two previous groups. Many are still constructed wholly or partly from wood and covered with fabric. Even those built in the then new all metal monocoque construction technique often have aerodynamic control surfaces covered in fabric. Much of what has already been written about the conservation/restoration of the earlier aircraft is equally applicable to World War 2 machines. The airfield requirements for active aircraft are also virtually identical except, being generally larger and faster, the size of the grass field also needs to be somewhat larger. Some of the later aircraft in this category are fitted with nose rather than the more common tail wheel undercarriage. These are less constricted by the need to operate directly into wind as their tail wheel contemporaries and they are thus better able to fly from a fixed orientated paved runway.

Documentation

Although these aircraft are all originally military machines, those which are now flown do so as civilian registered aircraft. Thus all the requirements for documentation which apply to the inter-war section are equally applicable here. Many archives survive in the national military museums and access is generally satisfactory. However the great interest in this period of aviation history has meant that private individuals are keen collectors of all aspects of memorabilia, including documentation. The continuing public and museum interest in the period means that research is continuously ongoing and new reference books are published virtually every day. Although a percentage are primarily coffee table picture books, many are the result of serious research and improve the overall knowledge of the subject.

Human Resources

Because of the increasing value of aeroplanes from this period, an ever expanding industry has grown up throughout Britain, Europe and the USA to cater for the restoration and repair of these aircraft. In practice, many of the machines now being rebuilt were acquired as severely damaged and corroded wrecks. The specialist skills required to undertake these total reconstructions are generally acquired on-the-job but based upon a background of a general aeronautical engineering qualification. In practice most of the sheet metal skills required to repair corrosion in a Boeing 747 are also applicable to a World War Two fighter.

The area where specialist skills are in very limited supply in the United Kingdom is the rebuilding of the aero engines of this period. Both radial air cooled and in line liquid cooled engines (including the Rolls-Royce Merlin) are now usually refurbished by specialists in the USA. There are a few highly skilled engineers in the UK who can undertake this work, but often it is just for their own satisfaction and not undertaken as a commercial contract. The rebuilding for flight of Shuttleworth's Spitfire and Hurricane, including the Merlin engines, were undertaken by skilled volunteers based at the Imperial War Museum, Duxford. The latter organisation has taken a leading role in fostering collaboration between a museum and private aeroplane collectors. The most recent example of this has seen the museum providing the base for the technical support organisation for de Havilland aeroplanes including the Tiger Moth and Chipmunk. Again IWM Duxford has for almost 30 years been a centre for volunteer work on flying and non-flying aircraft. Employment of skilled professional staff is essential for the effective use of volunteers. The employment of such staff on privately owned projects and museum aircraft has grown very rapidly over the past 20 years.

The operation of aircraft from this period requires similar piloting skills to those for the Inter War period for the lighter aircraft, but significantly greater experience is needed when a powerful single engined fighter or multi-engined bomber is involved. Frequently the pilots are former military aircrew but a few have achieved their aim of flying such aircraft as the Spitfire by following the same sequence of training aircraft as their 1940s predecessors. With the reduction in the armed forces, the reduced numbers of military trained pilots will, in the future, mean more pilots following the civilian training programme.

Public Access

Where there is an agreement between an owner and a public museum, public access is automatic. However, many historic aircraft from this period are hangared on private airfields. Some, like Sywell Airport in Northamptonshire organise conducted tours of historic aircraft on the airfield. This is, however, unusual. Others do occasionally permit

re-arranged group visits on a limited basis. However for most of this group, the main public interface is at public air displays during the summer months. The numbers involved can be surprising large. The web site of one of the major organisations, the Old Flying Machine Company, claim that their aircraft are seen by over 5 million people a year throughout Europe, from Norway to Italy. The use of the internet is now widely accepted by all the larger organisations to sell their aeroplanes for airshow and film work and also to attract members to their Friends organisations.

The public museums are generally very supportive of public access and education opportunities. Many allow a degree of pre-arranged access to their aircraft and some organise special adult study days in addition to the normal school programmes.

Funding

Sources of funding are as varied as the collections themselves. The national museums have mixed sources including public money, admission fees, trading and sponsorship. Independent public collections are largely privately funded by admission fees, donations, trading and some grant aid. Private collections are naturally privately funded, supplemented by trading - both of memorabilia and of complete aircraft, also friends organisations and air display fees.

Prioritisation

The background to the history of prioritisation schemes has been outlined earlier. With the BAPC Register classifying the individual aircraft on public display, those aircraft are very well covered, but the large number of privately owned machines have not been graded except for this report which classifies the overall historic importance of the type, not the individual airframe.

Table 4. World War 2 Period

Manufacturer	Type	Description	Grade	Approx. No. Extant in UK	% air worthy	No. in Private & Individual Collections	No. in Public & Trust Collections
Auster	3/4/5	Air Observation Post a/c derived from pre-war Taylorcraft. Reconditioned post-war for civil use	B	50+	50%	48+	2
Avro	Anson	RAF twin engined general purpose a/c. 11,000+ built from 1935 most as trainers & communications.	B	16	6%	6	10
Avro	Lancaster	Renowned 4 engined RAF bomber, 7,000+ built in UK & Canada from 1941	B	5 incl. nose section)	20%	1	4 (incl. 1 in BBMF)
Beech	18/C-45 Expediter	Twin engined multi-purpose pre-war design, 5000+ built for military use	B	6	50%	5	1

Manufacturer	Type	Description	Grade	Approx. No. Extant in UK	% air worthy	No. in Private & Individual Collections	No. in Public & Trust Collections
Bell	P-39 Airacobra & P-63 Kingcobra	Unusual mid-engined single seat fighter, widely used by US, UK & Soviet air forces	B	3	33%	3	0
Boeing	B-17 Flying Fortress	Most famous American 4 engined bomber of WW2	B	3	33%	0	3
Boeing-Stearman	Model 75 Kaydet	Pre-war primary trainer, 8,000+ built for US & allied air forces	B	35+	70%	34+	1
Bristol	Blenheim/ Bolingbroke	Twin engined bomber and night fighter of early WW2, 6000+ built	B	4	25%	1	3 (2 stored)
Bristol	Beaufighter	Twin engined night fighter and strike a/c, 6000 built - used throughout Commonwealth	B	6 (2 are parts only)	0%	2 (under restoration for flight)	4 (2 - major components)
Bucker	Bu 131 Jungmann	Primary 2 seat trainer from 1935, 4000 built in German & Japan. Post-war production in Spain etc.	S	30+	60%	30+	0
Bucker	Bu 133 Jungmeister	Single seat Competition aerobatic version of Jungmann.	N	9	65%	9	0
Cierva / Avro	C.30/ Rota	Pre-war Cierva autogiro, 12 built by Avro under licence for RAF	S	4 (1 parts only)	0%	0	4 (1 on loan)
Consolidated	Catalina	US long range maritime patrol amphibian, originally flown 1933. 3,000+ built for allied air forces	B	4	25%	3 (1 for rebuild)	1
Curtiss	P-40	The 3rd most numerous American single seat fighter with 13,700 built	B	3	67%	2	1
De Havilland	Mosquito	RAF all wooden high speed twin engined multi-role a/c. 7000+built from 1940.	B	9 (Incl. major parts)	0%	1	8
Douglas	A-26 Invader	Twin engined high speed medium bomber, served from end of WW2 to Vietnam War. 2500 built	B	1	0%	1	0
Douglas	DC-3/ C-47	In widespread airline service prior to WW2, 10,000+ built for military use and post-war airliners.	B	20	45%	14	6
Fairchild	PT-19 Cornell	US 2 seat basic trainer, 8,000+ built from 1939, served with US & allied air forces.	S	2	50%	1	1
Fairchild	F-24 Argus	3/4 seat high wing cabin monoplane built from 1933 to late 1940s for civil & military use	S	11	45%	9	2
Fairey	Swordfish	Biplane carrier borne torpedo bomber used throughout WW2, 2000+ built	B	6	33-50% 1 under restn.	0	6 (incl. RN Historic Flight)
Fairey	Firefly	Naval fighter, 1300 + built from 1941, WW2 & post-war production. Served to mid 1950s	B	5 (incl. major parts)	20%	1 (cockpit only)	4 (incl. RN Historic Flight)
Fieseler & Morane Saulnier	Fi 156 Storch & Criquet	German army co-operation a/c from mid 1930s. 3000+ built including post-war French a/c	B	4	25%	1	3

Manufacturer	Type	Description	Grade	Approx. No. Extant in UK	% air worthy	No. in Private & Individual Collections	No. in Public & Trust Collections
Focke Wulf	Fw190	The best German fighter of WW2, nearly 20,000 built	B	3	0%	1	2
Gloster	Gladiator	Last RAF biplane fighter serving from 1937. Famous for initial defence of Malta GC	B	4 (incl. major parts)	33%	1 Under restoration	3
Grumman	Wildcat/ Martlet (RN)	Widely used by RN & US Navy from 1940/4. 7000+ built	B	4	25%	2	2 (1- parts under restn)
Grumman	Hellcat	Very successful US naval fighter from 1943, also RN. 12000+ built	B	3	33%	2	1
Grumman	Avenger	Large single engined torpedo bomber widely used by US & allied naval units. 10,000 built	B	3	33%	1	2
Grumman	G-21 Goose	6/7 seat amphibian first flown in 1937. Used by US Navy & Coast Guard, RAF & RCAF.	S	2	50%	2	0
Hawker	Hurricane	First RAF monoplane fighter served from 1937, vital in 1940 Battle of Britain. 14,000+ built	B	20 (incl. potential rebuilds.	25%	10	10 Incl. 2 RAF Memorial Flt.
Hawker	Tempest	Last RAF piston fighter-entered service in 1944, 1,400 built	B	6 incl. potential rebuilds	0%	4	2
Ilyushin	Il-2 Shturmovik	Soviet ground attack a/c, built in greater numbers than any other a/c (41,000+) served to late 1950s	B	3 (all potential rebuilds)	0	3	0
Lockheed	Ventura	US WW2 maritime patrol bomber, also used by RAF. Post-war executive conversion called Howard 500	S	2	50%	1 (Howard 500)	1
Messerschmitt	Bf.109	Principle Luftwaffe single seat fighter, 30,000+ built 1935 - 1945	B	5 (incl. potential rebuilds)	0	2	3
Mitsubishi	A6M Zeke Zero	Most famous WW2 Japanese single seat fighter, 10,000+ built from 1939	B	3	0	1 (for potential rebuild)	2 (both incomplete)
North American	T-6 Texan/ Harvard	More than 15,000 Texan/ Harvards served with Allied Air Forces for advanced pilot training. In service with some air arms to 1990s	B	30+	67%	26+	4
North American	B-25 Mitchell	Versatile medium bomber, 10,000 built, saw service with virtually all allied air forces world-wide	B	5	20%	3	2
North American	P-51 Mustang	The outstanding escort fighter of the war, with R-R Merlin engine, it made US daylight bombing viable	B	10	50%	8 (incl. restoration projects)	2
Republic	Thunderbolt	Large US single engined fighter, 15,000+ built, US, UK & world-wide use.	B	3	33%	1	2
Ryan	ST3KR/ PT-21/22	Tandem 2 seat primary trainer, 1000+ built for US military 1939-42	N	4	50%	4	0

Manufacturer	Type	Description	Grade	Approx. No. Extant in UK	% air worthy	No. in Private & Individual Collections	No. in Public & Trust Collections
Stinson	Reliant/ Voyager	1935 4/5 seat cabin monoplane, WW2 communications /trainer for US & UK services. Also substantial post-war production	N	6	80%	6	0
Supermarine	Walrus	Biplane amphibian RAF & RN use from 1933 throughout WW2, 700+ built	B	3	0%	1 (under restoration)	2
Supermarine	Spitfire & Seafire(all versions)	Most famous fighter of WW2, constantly improved throughout production. 20,000+ built 1936-46	B	50+ incl. rebuild projects	40% Incl. BBMF	28+	22
Vought	Corsair	Pre-eminent WW2 naval fighter, serving with US & UK navies. 12,000 built. French use post-war	B	3	67%	2	1
Vultee	BT-15 Valiant	Most numerous US basic trainer (9,500+ built 1940-44)	S	1	0%	1	0
Westland	Lysander	Army co-op & special duties STOL a/c from 1938. 1,500 + built	B	3	33%	0	3
Yakovlev	Yak 1/3	Series of single seat, single engined Soviet fighters from 1940. 36,000+ built. Yak 3U - 2 seat trainer evolved into post- war Yak 11 trainer	B	4 (incl. 2 Yak 3U)	0%	4	0
TOTALS			B-79% S-16% N-5%	416	41%	288	128

3.9 Post-war Period - General Aviation including Executive and Light Aircraft

Basic Details

The following table records aircraft types which have been part of the development of post-war General Aviation in Britain. The UK-built aircraft constructed in the immediate post-war years are now generally regarded as historic, but this does not usually apply to the large numbers of imports which followed the relaxation of import restrictions in late 1950s. Those from the USA were often mass produced. Other significant imports were products of the French light aircraft industry which, post-war, recovered more successfully than that in the UK, with both home-built and factory produced designs. Other early US-built designs have been subsequently imported as classic aircraft, these include the Cessna 120/140 series and Luscombe designs. Although many are 50 or more years old, almost all are everyday working machines and not yet considered as historic aircraft. A relatively small number are operated as vintage types within the overall total extant, but there are others which are in store and may be earmarked by their owners for future preservation. These are recorded under the “No. in Private & Individual Collections” column, which can be taken as the best indication of the population in private preservation.

Thus, although the overall total in this matrix is around 4,500 airframes, around 73% being flyable, the total which can at present be realistically considered to be of historic interest is much smaller, up to 480 aircraft, of which about 100 (21%) are airworthy. The number of aircraft from this period held in the national/public collections is lamentably small, at 48 (including the 4 in the BAPC NAH Register which are not covered by the table), virtually all of which are British -built. Thus some 90% of the preserved post-war civil light aircraft are in private or individual collections. Unlike other sections, there is no public collection whose remit adequately covers this aspect of British aviation history, although both the Science Museum and the Duxford Aviation Society have some involvement.

Physical Needs

The construction of the earliest of the airframes in this sector is the same as their pre-war predecessors. Many were built from timber, virtually all were fabric covered; it was almost as if the advances in military aviation which the war had generated had never taken place. Thus the oldest aircraft require the same hangarage and environmental conditions if severe deterioration of the structure and fabric is to be avoided. Similarly the restoration/ conservation requirements from the inter-war sector are equally applicable to these airframes. Although some of the earliest American imports were also fabric covered, most were of all metal construction and are thus more durable. However the corrosion which will start in any metal structure means that hangarage is essential if long-term survival is to be assured. Many of the more recent aircraft are now built from composite materials, glass and carbon fibre which are very corrosion resistant and the primary need for hangarage is as protection from wind damage.

Documentation

With such a high proportion of this category still being airworthy, the requirement for documentation is an integral part of a certificate of airworthiness or permit to fly. Unlike the pre-war sector, most of the technical documentation is readily available.

Human Resources

The repair/conservation skills necessary for work on the early post-war airframes can be read across directly from the inter-war report. In fact most of what is recorded under Human Resources in that category is also applicable here. Differences include the standard monocoque construction of most of the post-war mass-produced American airframes which is readily repairable unless severely damaged by a major accident. A wide range of commercial organisations are available to carry out this form of restoration/repair. A percentage of the aircraft of this period are home-built from a variety of construction methods including wood and tubular steel, although more recent projects often use composite structures made from glass and carbon fibre. In almost every case, the skilled home-builder is capable of making repairs when necessary. However the need for supervision by a licensed engineer as discussed in the inter-war section still applies.

There are mutual support organisations for a number of aircraft types in this category. These include clubs for the Chipmunk, the Jodel, the Nipper, Vintage Pipers, Aeroncas, the Pitts Specials, the Europa, the Bolkow, Austers and Beagle Pups. Organisations which are supportive for a wide range of aircraft types include the Popular Flying Association (PFA) and the Vintage Aircraft Club. Most of these are run on a non-profit basis. Most pilots operating aircraft of this period will have obtained their licence from a flying school operating modern nosewheel aircraft. This level of piloting skill is perfectly adequate for all but the earlier aircraft which have tailwheels (when additional training will be necessary to achieve the requisite skills).

Public Access

Ten per cent of the nearly 500 airframes of historic interest are in public museums and readily accessible for visitors. However that leaves 90% which are not accessible. Again much of what has been recorded under this section in the inter-war section is applicable. Apart from the museums, the use of ICT is negligible.

Funding

Funding of the historic aircraft in this section is again almost wholly private. The availability of sponsorship is sadly less than in the inter-war section although most of what is noted there is also applicable here.

Table 5. Post-war Period, General Aviation including Executive and Light Aircraft

Manufacturer	Type	Description	Grade	Approx. No. Extant in UK	% air worthy	No. in Private & Individual Collections	No. in Public & Trust Collections
Aeronca, also Champion & Bellanca	7 series & Citabria	Post-war, Aeronca (USA) designed the 7 series 2 seat cabin high-wing a/c. Later made by Champion & Bellanca. 10,000+ built	N	40+	70%	3	0
Auster	5 J series	Most popular post-war British light a/c derived from WW2 observation a/c. 900 + built	B	100 +	35%	95 +	5
Auster & Beagle-Auster	6A/ Terrier	Former military AOP 6 & T7 versions (built 1946-1953) reconditioned for civil use 1961-68	S	36	70%	33	3
Beagle-Auster	D-4/5/6	Last of the classic tailwheel Auster. 35 built 1960-67	N	10 incl. working a/c	60%	7	0
Beagle	Airedale	The first attempt to produce a modern 4 seat tricycle u/c was structurally still an Auster. 43 built	S	13	50%	5	0
Beagle	B 206	1960s UK design for a twin engined multi-role a/c. 70+ built including 20 for RAF as the Basset	S	6	50%	1	2
Beagle	B 121 Pup	1960s UK design for light 2 seat trainer, 160 + built	B	60 +	80%	5	0
Beech	35 Bonanza	4/5 seat a/c, 14000 built since 1947, famous for its V tail version	B	14	80%	14	0
Britten Norman	BN-1	Single seat light a/c. Sole example of first (1951) design by BN	N	1	0%	0	1

Manufacturer	Type	Description	Grade	Approx. No. Extant in UK	% air worthy	No. in Private & Individual Collections	No. in Public & Trust Collections
Cassutt	Racer	US designed home-built racing monoplane.	N	15+	60%	1	0
Cessna	120/140 series	First post-war Cessna classic all metal high wing 2 seat design, 8000 built from 1946	S	30+	70%	2	0
Cessna	150/152 series	Ubiquitous US 1950s designed 2 seat training, touring & aerobatic a/c. Over 24,000 built in USA & France from 1957	B	600+	80%	25+ (many in store following accident)	1 hands-on a/c
Cessna	170/172/175/177 series	Mass produced US designed 4 seat touring a/c. 35,000 + built from 1948	B	450+	80%	10+ (many in store after accident)	1 (wreck only)
Cessna	180/182/185 series	4 to 6 seat touring a/c, 18000+ built in the USA & France from 1953	S	150+	80%	5+ as above	0
Cessna	205/206/207/210 series	Introduced in 1962, 6 seat multi-purpose a/c, 7000+ built	S	40+	80%	3+ as above	0
Cessna	310 series	Twin engined low wing 4/5 seat a/c. 10,000 built in US from 1953	S	50+	75%	3 as above	0
Cessna	336/337	Revolutionary tandem twin engined, 4/6 seat a/c, also used as spotter a/c during Vietnam war	S	20+	80%	3 as above	0
Chrislea	CH-3 Super Ace	All metal 4 seat cabin monoplane, a total of 16 were built to 1950.	N	3	33%	3	0
Cranfield	A.1 Chase	Designed & built in 1970s as a single seat competition standard aerobatic a/c.	N	1	0%	1	0
Currie	Wot	Ultra-light single seat a/c designed in 1930s. post-war 20+ home-built and as replica WW 1 SE-5 fighter	N	15+	33%	15+	0
C Z L	Aero 45/145	Czech all metal twin engined 4/5 seat a/c, 700+ built from 1947	S	2	0%	2	0
de Havilland	DH 104 Dove & Devon/ Sea Devon	Designed to replace the Dragon Rapide, 500+ built from 1945 for civil & military use	B	30	15%	19	11
Druine	D.5 Turbi	Wooden tandem 2 seat version of more successful Turbulent	N	3	67%	3	0
Druine	D.31 Turbulent	First really successful post-war wooden home-built light a/c	S	40+	50%	5	1
Druine	D.62 Condor	Side-by-side seating version of Turbi. Some 50 built in UK by Rollason from early 1960s	N	40	75%	4	0
Edgar Percival & Lancashire A/C	EP.9 Prospector	Mid 1950s attempt by Percival to build a multi-purpose 6 seat a/c. 28 built by 1961, most for civil use.	N	3	33%	2	1
Ercoupe, Alon & Forney	415/ Aircoupe	Built by Ercoupe from late 40s to 1955, then by others. 2000+ built. Imported into UK from 1960s	S	14	70%	3	0

Manufacturer	Type	Description	Grade	Approx. No. Extant in UK	% air worthy	No. in Private & Individual Collections	No. in Public & Trust Collections
Globe	GC-1 Swift	Advanced all-metal 2 seat cabin monoplane. 1000+ built in USA 1945-1951	N	3	33%	2	0
Hawker Siddeley	H S 125	Highly successful executive jet, originally conceived by DH	B	60+ incl. RAF use	95%	3	3
Jodel	D & DR series	From the D9 Bebe of 1948 came a very successful series of 2 & 4 seat light a/c.	S	400+	80%	10	0
LET	L-200 Morava	4/5 seat replacement for the Aero 145, flown in 1957. 500+ built	N	2	50%	1	0
LeVier	Cosmic Wind	Single seat racing monoplane designed by Lockheed test pilot in late 1940s	N	2	100%	2	0
Luton	LA-4 Minor	Pre-war light a/c re-introduced post-war as home-built design	S	30+	20%	6	1
Miles	M.18	Designed in 1939 as a replacement for the military Magister. 3 built	N	1	0%	0	1
Miles	M.38 Messenger	First built for RAF during WW2, main production post-war for private use.	B	10	33%	8	2 (1 being restored)
Miles	M.65 Gemini	successful 4 seat private a/c. 150 built post-war.	B	6	17%	5	1
Mooney	M-20	US high performance 4 seat cabin monoplane, From 1953, 7,000+ built, still in production	S	50+	90%	2	1
Morane Saulnier	MS 733 Alcyon	French 2/3 seat basic and armament trainer. 150+ built from 1951 for French armed forces	N	1	0%	1	0
Morane Saulnier	MS 760 Paris	Jet powered 4 seat liaison a/c. First flew in 1954, civil & military use,	N	1	0%	1	0
Morane Saulnier	MS 880 Rallye	very successful French light a/c with over 2,500 built since 1959	S	150+	80%	9	2
NDN Aircraft	NDN 1 Firecracker	NDN was founded in 1977 to build the Firecracker 2 seat trainer, later an unsuccessful entry in 1980s RAF basic trainer competition	N	1	0%	1	0
NDN Aircraft - became Norman Aeroplane Co.	NDN 6 Fieldmaster/ Firemaster	Large single engined design for agricultural, firefighting & pollution work. 6 completed	N	2	0%	2	0
Norman Aeroplane Co.	NAC 1 Freelance	4 seat utility a/c developed from the Britten-Norman BN-3 Nymph	N	1	0%	1 plus other incomplete fuselages	0
Nord	1002 Pingouin	French derivative of Messerschmitt Bf 108 3 seat communication a/c. Nearly 300 built from late 1940s	S	4	25%	4	0
Nord	1101 Noralpha	Based on the Bf 208 4 seat a/c with French engine. 200 built	N	3	0%	3	0
Nord	1203 Norecrin	Final development of the series, 500+ built from 1948.	N	2	0%	2	0

Manufacturer	Type	Description	Grade	Approx. No. Extant in UK	% air worthy	No. in Private & Individual Collections	No. in Public & Trust Collections
Nord	3202	Tandem 2 seat trainer, 100 built 1959-61 for French army	N	3	67%	3	0
Nord	3400	2 seat observation and casualty evacuation a/c. 150 built for French army from 1959 to 1961	N	1	0%	1	0
Nord	N C 854/858	Light cabin mid wing monoplane, 850 series originated in 1947.	N	9	50%	2	0
Percival	P 50 Prince	Twin-engined executive transport, one civil version extant but more military variants survive	N	1	0%	1	0
Piel & others	Emeraude	2 seater, first flown in 1952. Many different makers in France & UK including home-built.	S	40+	75%	2	0
Piper	PA-12 Super Cruiser	US 3 seat development of J-5 (see inter-war matrix). Nearly 4000 built	N	8	90%	1	0
Piper	PA-15/17 Vagabond, PA-16 Clipper	2/4 seat high wing tourer/trainer. 1,300 built from 1948 to 1950	N	30+	95%	2	0
Piper	PA-18 Super Cub	First post-war Piper a/c to achieve mass production. 10,000+ built from 1950 for civil & military use.	S	100+	80%	9	0
Piper	PA-20 Pacer	Developed from PA-16 in 1949. Over 1100 built to 1954	N	18	80%	2	0
Piper	PA-22 Tri-Pacer/Colt	Improved Pacer with nose wheel, 9,500 built from 1950 to 1964	S	60+	80%	6	1
Piper	PA-23/27 Apache/ Aztec	First twin engined Piper a/c, nearly 7000 built	S	130+	15%	9+	1
Piper	PA-24 Comanche	High performance single engined monoplane, over 4,700 built.	N	30+	90%	1	1
Piper	PA-25 Pawnee	Designed specifically for crop and pest spraying, over 5,000 built.	S	40 +	90%	1	1 + other major parts
Piper	PA-28 Cherokee	Very successful 2/4 seat tourer/trainer. 31,000 + built from early 1960s	B	1000+	90%	9	0
Piper	PA-30 Twin Comanche	Twin engined, 4 seat version of the PA-24, 2000 built 1963-1970	N	50+	90%	3	0
Pitts	S-1/S-2 Special	High performance biplane aerobatic a/c designed in 1945	S	90+	90%	4	1
Porterfield	CP-50, CP-65	Tandem 2 seat cabin monoplane built from 1939 powered by a 50hp or 65 hp engine	N	2	100%	2	0
Putzer	Elster-B	Side-by-side 2 seat dual control monoplane. Produced in 1960 for the Luftwaffe sporting flying clubs	N	3	33%	2	0

Manufacturer	Type	Description	Grade	Approx. No. Extant in UK	% air worthy	No. in Private & Individual Collections	No. in Public & Trust Collections
Republic	RC-3 Seabee	4 seat low cost amphibian, 1000+ built in 1946/47	N	1	0%	1	0
Rutan	Varieze and Long-Ez	US pioneering composite structure home built design from mid 1970s	B	30+	90%	2 (in store, damaged)	0
SAAB	91 Safir	Swedish 3/4 seat primary trainer first flown in 1945. 300+built	N	6	17%	4	1
Shaw	Europa	UK designed advanced composite structure home-built a/c	S	100+ incl. being built	90%	0	1 (prototype)
S.A. I	KZ VIII	Danish all wood single seat aerobatic a/c first flown in 1949.	N	1	0%	1	0
Slingsby	Motor Tutor, also Motor Cadet	Motorised version of Tutor glider, first flown in 1948. Later conversions from ex-ATC a/c	N	15+	33%	9	0
Somers-Kendall	SK-1	Jet powered single seat racing a/c, sole example from 1955	N	1	0%	1	0
Stampe	SV-4	A pre-war Belgian tandem 2 seat biplane design, 700+ built from 1947 in Belgium & France	S	50+	67%	11	0
Taylor	JT.1 Monoplane	One of the first post-war UK home-built Ultralight a/c. First flown 1959.	S	30+	33%	0	0
Taylorcraft (US)	BC-12	Imported post-war contemporary of the UK Taylorcraft a/c	N	20+	75%	2	0
Thruvton	Jackaroo	1950s 4 seat adaptation of the Tiger Moth built before US imports were permitted	S	4	50%	4	0
Tipsy	Nipper	2 seat Belgium design, first flight in 1957, many also built in UK	N	30+	67%	2	0
Zlin	226/326/526 Trener series	Czech tandem 2 seat aerobatic trainer from 1955. 1,500+ built. widespread international use	S	12	80%	2	0
TOTALS			B-53% S-38% N-9%	4429	73%	435	44

3.10 Post-war Period - Commercial Aviation

Basic Details

As might be expected in a category consisting of large or very large aircraft, this matrix has the smallest number of airframes in actual preservation. By far the largest part of the 184 aircraft in this category are still in service or perhaps in open storage pending overseas sale or scrapping. Realistically, the total which may be considered to be available for preservation, including the 29 aircraft solely on the BAPC NAH Register, is at most 60, of which almost 75% (44 aircraft) are in public collections. Of those in the private sector, a couple are airworthy but most of the rest are in open storage and may or may not be candidates for long term preservation as this is a sector which is not attractive to the private collector.

Limited resources and very few collections are likely to be the main reasons why many post-war commercial aircraft of importance to British airline history have yet to be preserved in the UK. These include the Airbus Industrie A.300/A.310, the Boeing 737 and Boeing 747, the British Aerospace (BAe) 146 and BAe 748 (one example of the military version, the Andover, is in public preservation). Just one example of Britain's most successful post-war airliner, the Britten-Norman Islander, has recently been preserved in a private collection, but none of its 3-engined derivative, the Trislander. No example of the once popular but now obsolete use of aircraft for cross-channel car transportation has been preserved in the UK (such as the Bristol 170, or the Aviation Traders Carvair), although examples of each exist overseas.

Physical Needs

Airliners, although larger than most other historic aircraft, still require hangarage to ensure their long-term survival. However, almost all the privately owned non-flying examples are believed to be in open storage, and at least 75% of those in museums are also displayed outside. A paper was given to the IATM during the early 1980s on the conservation measures being undertaken by Swissair to preserve one of their airliners in open storage. This involved the sealing of all accessible apertures and to prolong the life of the structure very extensive use of dehumidifiers throughout the airframe including the wings and tail. Sadly intensive dehumidification is not compatible with public access. This very expensive procedure has not been adopted by British collections although many do make some use of dehumidification within the main aircraft cabin. This can slow the rate of deterioration within the cabin but corrosion within the rest of the structure will continue unchecked. This can have serious consequences in the more modern airliners (1970s onwards) which began to make use of advanced constructional techniques adopted from military aircraft manufacture. Conventional sheet metal repair techniques are not appropriate for corroded areas of these structures.

Documentation

Much of what has already been written earlier about the documentation of civil aircraft is of course applicable to commercial aviation. Post-war airliners usually have a very extensive library of technical and operational documents and these are normally made available when an airframe is taken into preservation. The conservation of this largely paper archive is not normally a high priority as the more immediate problems of the airframe itself always take precedence. In the post-war era, many airlines have been created, all with their own, often distinctive livery, uniforms and documentation. Some lasted but a few months, others a few years and those that have survived have evolved through many changes of equipment, uniforms etc. Commercial survival in the very competitive airline market has always been the over-riding preoccupation of airline directors, leaving little or no resources for recording their own history.

In practice the day to day recording of airline history is very much in the hands of private individuals and enthusiast organisations such as Air Britain. When an airline goes into receivership, it is generally the private individual who seeks to collect and preserve the memorabilia and documentation of that now defunct company. Today the archives of former airlines like Silver City and Dan Air are in private hands with all the inherent problems of access for research in the short term and the actual

survival of the collection in the longer term. Regrettably, unlike military documentation, there is no obvious long-term home for civil and commercial aviation documentation.

Human Resources

The conservation skills required for most of the early airliners are very much those of a general aeronautical engineer, especially one with sheet metal experience to repair/replace corroded sheet metal. A solution to the impending problem of the repair of corroded sections of chemical etched skins and of wing spars originally machined from a solid billet has yet to be found.

Although there are many professional companies involved in the maintenance and repair of the 'in service' commercial airliner, there are none catering for the preserved airliner. The workforce involved in the preservation of commercial aircraft is largely voluntary. Regrettably the attraction of working as a volunteer on a static airliner has always been less than working on a military aircraft. This is yet another problem facing the museums which have a civil collection. There has been some support, from the airline industry, primarily for their former equipment. This support is invariably in kind, for example materials for repainting, sometimes skilled or semi-skilled labour for urgent conservation work.

As there are no privately owned post war commercial aircraft being operated, the requirement for a commercial pilot's licence is not applicable. However, as historic examples of piston-engined commercial aircraft are flown in Europe and the USA, it is virtually certain that one will be operated in the UK in the future.

Public Access

These aircraft in preservation have a major advantage over their military counterparts - they were designed for public access. Having said that, the interiors of most of the aircraft in public museums are not regularly opened to visitors. Of the three major UK airliner collections, only one, the Duxford Aviation Society's collection displayed at Duxford Airfield near Cambridge, has at least two of its aircraft regularly open. The British Airways collection at RAF Museum, Cosford near Wolverhampton has its collection accessible for external inspection on a daily basis, but that of the Science Museum, although stored under cover at Wroughton in Wiltshire, is only accessible on an occasional open-day.

Funding

Funding is from a mixture of sources. The national collections receive public money supplemented where possible by sponsorship. The trust collections in the public sphere have to rely upon the income they generate, mainly by providing services to the host organisation and by opening their aircraft for public inspection. They can also obtain grants from bodies such as HLF.

Prioritisation

As the majority of the aircraft in this sector are recorded in the BAPC Register, that reference provides a good assessment of the relative historic values of individual preserved commercial aircraft. The assessments within this matrix are again an indication of the overall historic importance of the type only. There has been no other prioritisation of needs of this sector.

Table 6. Post-war Period - Commercial Aviation

Manufacturer	Type	Description	Grade	Approx. No. Extant in UK	% air worthy	No. in Private & Individual Collections	No. in Public & Trust Collections
Aerospatale/ BAC	Concorde	Anglo-French supersonic airliner, 20 built from 1969.	B	10 (7 in service)	none at present	1 (stored)	2
Aero Spacelines	Super Guppy	Specialised over-sized freighter, converted from Boeing 377 airliner, used in Airbus Skylink programme .	N	1	0%	1	0
B A C	One-Eleven	Most successful all UK jet powered airliner, 230 built from 1963, Noise will limit future commercial use .	B	30+	75%	3 (stored)	3
Boeing	707	Introduced in 1957, the 4 engined 707 created the current world-wide air travel mass market. Noise will restrict future commercial use.	B	5	0%	4 (stored or fire training)	1
Britten-Norman	Islander/ Trislander	Most successful post-war UK airliner. 2 or 3 engines(Trislander). 10-17 passengers. 1300+ built from 1965	B	50+	80%	1	0
de Havilland	DH 106 Comet	World's first successful jet airliner, entered service in 1952. Grounded after structural problems. Rebuilt to achieve first Transatlantic commercial service in 1958	B	6	05	2	4
de Havilland	DH 114 Heron	With 14-17 seats & powered by 4 piston engines, 140+ Herons were built from 1950	S	5	40%	3	2
Fokker	F.27 Friendship	Twin turboprop, most successful of the 1950s DC-3 replacement designs. 700 + built	B	15 + in service	95%	0	1
Handley Page	Herald	Also a DC-3 replacement - limited success, 52 built from 1960	S	7	0%	3 (stored)	4
Lockheed	L.1011 Tristar	US airliner powered by 3 RR RB 211 engines. 250 built from 1970	S	3	0%	1	0
Short	330/360	30 to 36 seat turboprop airliner derived from the utility Skyvan. 300 built from 1974 - 1992	S	30+ in service	90%	0	2
TOTALS			B-71% S-28% N-1%	161+	65%	19	24

3.11 Post-war Period - Military

Basic Details

This section is overall the largest for airframes in genuine preservation and when those only recorded in the BAPC NAH Register are included, it is equally divided between those in museums, in private and those in public collections. It was the ready availability of aircraft of this type in the 1960s, 1970s and the early 1980s which was largely responsible for the creation of the present British aircraft preservation movement. Large numbers of ex-military airframes were given or at most sold at a nominal price to aspiring preservation groups. This has had the result that certain types are preserved in much greater numbers than their historical importance might justify. It has also meant that 75 per cent of the aircraft in this section are not airworthy, generally because of the technical and cost implications of flying former military machines which may have been in service a decade or less before. There are also severe reservations on the part of the Civil Aviation Authority on the safety implications of organisations and private individuals operating such aircraft.

Over the past decade, the collecting rate has slowed dramatically due to a number of factors:

military aircraft are made to last longer so fewer are available for preservation;
when they are obsolete, most are now sold at public auction for relatively large sums;
the pioneering British aviation collections are now reaching maturity and have recognised that they are having difficulties in maintaining their present aircraft fleet.
They are now much more selective of what they seek to acquire.

In detail, the present Post-War Military category totals nearly 800 airframes, of which 100 appear only in the BAPC NAH Register. Almost 400 in the table are in private or individual ownership, leaving almost 300 in public care. The 26% of the 800 total which are airworthy are virtually all in private ownership, as the cost of operating many of the aircraft in this category is beyond the resources of any museum.

Among the types which exist in large numbers in the table, mainly in the public sector, are the Avro Vulcan (16), the Blackburn Buccaneer (16), the de Havilland Vampire (50), de Havilland Venom/Sea Venom (25), the de Havilland Chipmunk (120 plus - almost all private), English Electric Canberra (almost 30), the English Electric Lightning (over 30), the Folland Gnat (24 - mainly private), the Gloster Meteor (more than 55), the Hawker Hunter (50 plus), Hunting Jet Provost (50 plus, most private), the Lockheed T-33 (13), the Scottish Aviation Bulldog (21- most private). The BAPC register also records significant numbers of the following types which do not appear in private collections; the Dassault Mystere IVA (10), the Hawker Siddeley Harrier and its predecessors (11), and the North American F-100 Super Sabre (7). Three types which appear in large numbers are, at most, of limited historic significance to British aviation history. These are the Dassault Mystere, the Lockheed T-33 and the North American Super Sabre. Most of these are ex-French military aircraft originally purchased with funding from the USA government to whom their ownership reverted on retirement from service. The aircraft in public collections are now officially on loan from the USAF Museum.

Physical Needs

It is estimated that over 250 of the aircraft recorded here are displayed or stored in open air, many of them from those types which also appear in large numbers. It is inevitable that as time progresses that several of these will succumb to corrosion and be scrapped. This process has already started with the scrapping, in recent years, of aircraft from the collections of both the RAF and the Imperial War Museums.

The aircraft of this period were often constructed of complex alloys, the corrosion resistance of which was not fully understood at the time of manufacture. This is especially true of highly stressed parts like the undercarriage which can be highly susceptible to stress corrosion. Combat aircraft from the mid 1960s onwards began to use advanced constructional methods including chemical etching of aircraft skins and machining large components from solid metal. It is therefore even more important to avoid the onset of corrosion in these airframes as repair by conventional methods is virtually impossible to original standards. One TSR 2 from the defence programme cancelled in 1965 had to be repaired by very non-original cosmetic methods after many years of external storage. Hangarage is therefore necessary to ensure the preservation of aircraft of this era, although adequate dehumidification can delay the start of corrosion in those stored out of doors. For the moment, though, the problem of achieving satisfactory repairs to modern airframes built using advanced manufacturing techniques has yet to be solved.

Documentation

The maintenance history of military aircraft of this period is very fully documented in service. When an airframe goes into preservation, whether a private or public collection, this paperwork normally accompanies the airframe. The operational history documentation, however, which is essential for historians, is normally retained within the original service or its historical branch. This can be made available for research at a later date, but it is the individual specialist historian, together with groups like Air Britain, who will have recorded the history of a particular aircraft throughout its service life. These very detailed specialist histories of military aircraft types are often commercially published.

Human Resources

For most of the aircraft in this sector, the type of construction requires conservation skills of a general aeronautical engineer, especially one with sheet metal experience to repair or replace corroded sheet metal. Personnel are therefore likely to have had technical education in the armed services or commercial aviation before deciding to apply those skills in the often lower-paid but more satisfying historic sector.

The growing private market for former military jet aircraft of this period is beginning to generate a number of professional companies dedicated to their support. Ex-military aircraft require some modifications for civilian use and, although the early machines are technically less complex than the previous generation of high-powered piston aircraft, their maintenance is a specialist skill. The former RAF airfield of Kemble in Gloucestershire is becoming the primary maintenance and operating centre for historic jet aircraft, especially the Hawker Hunter.

The situation in the museum world is rather different. The skills to repair and conserve are the same but, if anything, the pay is even less. In the larger museums, a nucleus of technical staff is employed, usually supplemented by volunteers. In the independent museums, the conservation workforce is usually wholly volunteers. The prospect of working on former military machines is normally sufficiently attractive. At present numbers of volunteers appear to be sufficient for the current workload, however, as the aircraft in open display deteriorate, the demand for more personnel will accelerate and it is very unlikely that enough volunteers with the requisite skills will be available. It is equally unlikely that most of these collections will be able to afford to employ technical staff.

Pilots flying such aircraft are virtually all military-trained and often flew the same type during their military service. The piloting skills required are therefore very much those of a military environment.

Public Access

As with the previous groups there is clear divide between the public collections (good access) and private collections (poor or no access). Most of the aircraft recorded in the BAPC Register are in the good access category as they are displayed in museums/collections which are open on a regular basis. Some of the private collections do, however, have open days or displays at their home base. Others with flying collections participate in air displays in the UK and overseas. Education programmes are growing in importance in the BAPC member museums, but we have no knowledge of any education programmes based around private collections. As most of the aircraft of this period are the products of the Cold War era and many have participated in other conflicts, there is considerable educational potential. The internet is becoming the first choice for advertising amongst both museums and private collections.

Funding

Where the collection is open to the public, virtually all charge admission fees, although there are a few who offer free admission and rely on generous donations for their main source of income. Donations are also a valuable income source. Trading is important to almost every collection, many have restaurants and shops, some with mail order. A Friends or Membership organisation is common to many public and private collections. Sponsorship can be a useful source of funds but large long-term agreements are very rare in the historic aviation category. Grant aid, is currently restricted to public collections and preferably those having Museum Registration. One aspect of trading which is unique to the private collections is the sale or exchange of items from their collection. The flying collections also collect air display fees for the participation of their aircraft.

Prioritisation

The background to the history of prioritisation schemes is outlined in Section 3.4 Prioritisation. With the BAPC NAH Register classifying the individual aircraft on public display, those aircraft are very well covered, but the large number of privately owned machines have not been graded prior to this report (which only classifies the overall historic importance of the type, not the individual aircraft).

Table 7. Post-war Period - Military

Manufacturer	Type	Description	Grade	Approx. No. Extant in UK	% air worthy	No. in Private & Individual Collections	No. in Public & Trust Collections
Auster	AOP 9/11	Last production fixed wing Air Observation Post a/c for Br. Army, 160+ built. AOP 11-sole example	N	21	33%	16	5
Avro	Lincoln	Development of Lancaster, first flown in 1944, served to 1963. 500 + built	S	2	0%	1	1
Avro	Shackleton	RAF maritime patrol a/c derived from Lancaster/Lincoln. First flown 1949, served until 1971.	B	8	0%	3	5
Avro	Vulcan	RAF delta winged V bomber. 130 built from 1951. Served to 1983	B	16	0%	2	14 (some on loan)
Blackburn	Buccaneer	Low level naval strike a/c from 1961, later used by RAF to 1990s	S	16 (more in mil. use)	0%	5	11 (some on loan)
CASA	2.111	Spanish licensed-built version of WW2 Heinkel He.111 twin engined medium bomber	S	2	0%	1	1
De Havilland	DH 100/ 115 Vampire	Britain's 2 nd production jet fighter, just too late for WW2 service, later evolved into 2 seat jet trainer. Most survivors are the latter.	B	40	15%	14	26
De Havilland	DH 110 Sea Vixen	First Flown in 1951, developed into 2 seat naval fighter, 150 built	S	15	5%	6	9
De Havilland	DH 112 Venom/Sea Venom	Single & 2 seat fighter, developed from the Vampire, widely used by RAF, RN & other air arms	S	25	25%	10	15
De Havilland Canada	DHC 1 Chipmunk	Mid 1940s monoplane trainer, 1000+ built for military & some civilian use	S	120+	70%	115 +	5 (some damaged)
De Havilland	DHC 2 Beaver	Canadian utility a/c, 1500+ built from 1947, used world-wide incl. British Army	S	6	0%	3	3
Douglas	Skyraider	Naval piston engined attack a/c served from mid 1940s to Vietnam War. Also used by RN, 3000+ built	S	2	50%	1	1
English Electric	Canberra	Britain's first jet bomber, flown in 1949. Nearly 1400 built in UK, Australia and USA. Used by many air arms world-wide	B	27 (more in mil. use)	8%	4	23 (some incomplete)
English Electric	Lightning	First RAF supersonic interceptor, developed from 1954 research a/c. 340 built for RAF & other air arms	B	30+	0%	11+	19 (some incomplete)

Manufacturer	Type	Description	Grade	Approx. No. Extant in UK	% air worthy	No. in Private & Individual Collections	No. in Public & Trust Collections
Fairey	Gannet	UK naval anti-submarine & AEW a/c from 1949 to 1970s	S	13	0%	6	7
Fiat	G.46	Italian tandem 2 seat basic trainer from late 1940s. 200+ built	N	1	0%	1	0
Folland	Gnat	RAF 2 seat trainer version of 1950s lightweight jet fighter. Also from 1962 Red Arrows aerobatic team a/c	B	24	15%	19	5
Gloster	Meteor	First RAF jet fighter, in service 1944 to 1970s. World-wide use including Korean war.	B	55 +	5%	20+	35 +
Gloster	Javelin	All-weather delta winged 2 seat RAF fighter .serving 1956 - late 60s	S	8	0%	1	7 (some on loan)
Grumman	Tigercat	Large twin engined single seat fighter, just too late for WW2 service	N	1	100%	1	0
Grumman	Bearcat	Ultimate piston engined US naval fighter, just too late for WW2	S	1	100%	1	0
Handley Page	Victor	3 rd RAF V bomber, first flown 1952, served to 1994.	B	7	0%	1	6 (some on loan)
Hawker	Sea Fury	Final piston engined Hawker fighter, too late for WW2, used by RN in Korean War. 900 built	S	6	50%	5	1
Hawker	Sea Hawk	Naval single- seat jet fighter, served from 1953 to mid 1960s.	S	15	0%	5	10
Hawker	Hunter	Most successful UK post-war jet fighter, 2,000 built from 1951. Widespread use by UK & other air forces	B	50+ (more in mil. use)	20%	24+	26
Hispano	HA.1112 Buchon	Spanish licensed-built Messerschmitt 109 with R-R Merlin engine.	N	2	0%	2	0
Hunting / BAC	Jet Provost & Strikemaster	Developed from earlier Provost. First RAF trainer to provide <i>ab initio</i> jet training from 1960. 500+ built for RAF & other air arms	B	50+ (more in mil. use)	60%	40+	10
Lavochkin	La-9	Penultimate design in a famous Soviet series of piston engined single seat fighters, just too late for WW2	S	1	0%	1	0
Lavochkin	La-11	Final piston engined Lavochkin, in widespread use from 1948.	S	1	0%	1	0
Lockheed	T-33	2 seat advanced trainer developed from first successful US jet fighter. 6,000+ used world-wide	B	13	8%	3	10
Max Holste	Broussard	French 6 seat utility transport, 300+ built from 1952 to 1959	N	3	66%	3	0
Mikoyan	MiG-15	Very successful & widely used Soviet single seat jet fighter, also 2 seat trainer. First used in Korean War. 12,000+ built	B	6	15%	2	4

Manufacturer	Type	Description	Grade	Approx. No. Extant in UK	% air worthy	No. in Private & Individual Collections	No. in Public & Trust Collections
Mikoyan	MiG-17	Improved variant of MiG-15, replacing earlier a/c from 1954. 9,000 + built in USSR, China etc.	N	1	0%	1	0
Mikoyan	MiG-21	Designed in the mid 1950s as a Mach 2 single seat fighter. 12,000+ built in USSR, India, China etc. Served with 28 air forces.	B	5	0%	4	1
Mikoyan	Mig-23/27	Swing-wing single seat interceptor & strike fighter, widely exported.	N	4	0%	4	0
North American	T-28 Trojan	Large 2 seat piston engined trainer, replacing the T-6 Texan. 2000 built from 1950.	N	3	67%	2	1 (incomplete)
North American	F-86 Sabre	Very successful swept wing jet fighter, introduced during Korean War to counter MiG-15. Served with 20+ air forces	B	4	25%	1	3
Percival / Aviation Traders	P.40 Prentice	2/3 seat RAF basic trainer, 400 built from 1947. 20 converted to 5 to 7 seat civil a/c by Aviation Traders from 1957	N	6	16%	2	4
Percival/ Hunting	P.56 Provost	Side-by-side 2 seat basic trainer, first flown in 1950, 460 built by Hunting Aircraft to 1960	S	16	19%	9	7
Percival/ Hunting	Sea Prince/ Pembroke	Derived from civil Prince light transport. 50+ built from 1952	N	10	10%	3	7
Piaggio	P.149	Italian design, bought by German air force for basic trainer/liaison role. 2/5 seats. 260 built from 1956.	N	3	67%	1	0
Pilatus	P-2	Swiss designed tandem 2 seat trainer. 50+ built from 1945	N	4	50%	4	0
SAAB	32 Lansen	Advanced Swedish 2 seat all weather fighter, first flown in 1952. 450 built to 1960	N	1	0%	1	0
Scottish Aviation	Twin Pioneer	Twin engined STOL a/c flown in 1955, 40+ built for RAF & others	S	5	20%	2	3 (I nose only)
Scottish Aviation	Bulldog	Production of military Beagle Pup from 1973 for RAF & other users	S	21	67%	20	1
Shorts	Belfast	Large turbo-prop military freighter, 10 built for RAF from 1966. Civil use from late 1970s	S	4	50% (commercial use)	1 (in store)	1
Sukhoi	Su-17/-22 <i>Fitter</i>	Soviet swing-wing strike fighter, flown in 1971. Exported widely, 2000+ built to 1991	S	3	0%	3	0
Vickers-Supermarine	Swift	Largely unsuccessful single seat jet fighter, first flown in 1951.	N	5	0%	2	3
Yakovlev	Yak 11	Tandem 2 seat advanced trainer derived from wartime Yak 3 fighter. From 1946, 4,000+ built in USSR & elsewhere for communist bloc	N	6	67%	6	0
TOTALS			B-49% S-40% N-11%	681	30%	392	290

3.12 Post-war Period - Rotary Wing

Basic Details

Like the General Aviation and Commercial sections, this group has a large number (50%) of airframes currently extant which cannot be considered to be in preservation. Some are still in civilian use, others remain in military use as non-flying instructional airframes. However, of the some 250 aircraft which are preserved, two thirds are in the public sector, including the 51 recorded in the BAPC NAH Register. However, as with the military section, the types in preservation are overwhelmingly former military aircraft. Another parallel with that section is the preponderance of certain military types which became readily available in the 1970s and into the early 1980s. The Westland-built versions of American Sikorsky designs are the most obvious examples, with no less than 62 preserved Dragonfly, Whirlwind and Wessex helicopters. Two other Westland-built helicopters saved in large numbers are the Bell 47 Sioux (21) and the Wasp/Scout (more than 33). The only other type appearing in relatively large numbers is the series of autogiros designed and built over the past 40 years by Wing Commander Ken Wallis. The majority of this unique collection is in store including Little Nellie of James Bond fame but development of the series continues. Most of the rotary winged aircraft in public museums are preserved as part of a general aviation collection but Britain has an excellent dedicated Helicopter Museum at Weston-super-Mare. However, an example of the world's most popular civilian helicopter, the Bell JetRanger/LongRanger, with more than 9,000 built over the past 40 years, has yet to be preserved in Britain.

Of the 500 airframes recorded in this section, nearly a third are airworthy but these are predominately the smaller military and light civil helicopters. Very few of the larger, former military, machines are kept in flying condition.

Physical Needs

A significant number of the aircraft in public collections are in open display or storage as a helicopter without its rotors is much less vulnerable to the elements, especially wind, than its fixed wing contemporaries. Despite this, every aircraft of this era needs hangarage for long-term preservation, although extensive use of dehumidification can slow corrosion in those in external storage. The percentage of rotary wing aircraft stored in the open is lower than in the military section, mainly because a helicopter without its rotors is a relatively small aircraft and can make maximum use of scarce hangarage.

Documentation

As most of the aircraft preserved in this section are former British service machines, much of what is written the military section (3.11) is also applicable here. The documentation of civil aircraft can also be read across from the General Aviation section (3.9).

Human Resources

Helicopters are usually of all metal construction and the comments relating to the conservation skills of a general aeronautical engineer in the military section (3.7) are equally applicable here. Maintenance of the airworthy helicopter can be undertaken by the same companies who service general aviation; alternatively there are helicopter

specialists. To the best of our knowledge there is no organisation specialising in the conservation of historic rotorcraft. The remarks in section 3.11 relating to the conservation of military museum aircraft are equally relevant to helicopters except in respect of their attraction for volunteers. Helicopters have a dedicated following but it is a distinctly minority interest.

Public Access

The comments on Public Access in 3.11 are also applicable here.

Funding

With the exception of the comment on the sale or exchange of items from private collections which has little relevance, all other remarks on funding in 3.11 are applicable here.

Prioritisation

The background to the history of prioritisation schemes is outlined at 3.4 Prioritisation. With the BAPC Register classifying the individual rotorcraft on public display, those aircraft are very well covered, but privately owned machines have not been graded until this report.

Table 8. Post-war Period - Rotary Wing

Manufacturer	Type	Description	Grade	Approx. No. Extant in UK	% air worthy	No. in Private & Individual Collections	No. in Public & Trust Collections
Bell incl. Augusta & Westland	47 (Sioux)	First practical mass produced helicopter. Flown in 1945 and built in numerous versions for civil & military use world-wide. 6,000 built	B	40+	50%	7	14 Incl. Army Historic Flight.
Bell	204/205/212 UH-1 Iroquois	US army utility a/c, first flew in 1956. Mass produced for world-wide civil & military operators. Vietnam use.	B	15	25%	5 (incl. damaged examples)	5
Bensen	Gyrocopter	First practical home-built autogiro, from 1955 in USA, 1959 in UK	S	100+	33%	7	7
Brantly	B.2	2 seat helicopter, first flown in 1953, hundreds used world-wide	N	12	75%	10	2 (1 - parts only)
Campbell	Cricket	Evolved in 1960s from the Bensen Gyrocopter	N	30+	40%	0	0
Hiller	UH-12 (360)	Military & civil light helicopter, sold widely (2,500+) from 1948 incl. RN	S	6	0%	4	2
Hughes	269 (series 300)	Military & civilian 2/3 seat utility helicopter, first appeared in 1956.	N	50+	90%	2	0
Hughes	369 (srs. 500) OH-6 Cayuse	Military & civilian 5 seat helicopter, more than 1400 built for US army	S	30+	95%	0	1
McCandless	M-2 & M-4 Gyrocopter	Northern Ireland designed single seat gyrocopter. First flown (M-2) 1965, M-4 improved version	N	5	0%	3	2
MIL	Mi-2	Turbine-engined development of first Soviet helicopter (Mi-1). From 1962, 5,000+ built, mainly in Poland, for civil & military use	S	3	0%	2	1
MIL	Mi-24	From 1974 standard assault & anti-tank gunship helicopter of Warsaw Pact & other nations	B	5	0%	3	2

Saunders-Roe	Skeeter	Light 2 seat observation helicopter, originally flown in 1948. 70+ used by UK & other armies from 1958	S	14	30%	3	11
Wallis	WA-116 etc.	Series of autogiros designed & built by W/C K Wallis	S	19	0%	19	0

Manufacturer	Type	Description	Grade	Approx. No. Extant in UK	% air worthy	No. in Private & Individual Collections	No. in Public & Trust Collections
Westland	Dragonfly & Widgeon	Licence-built 4/5 seat version of Sikorsky S-51 for civil & military use. 150+ built from 1948-1959	S	11	0%	1	10
Westland	Whirlwind	Sikorsky S-55 built under licence. Many versions with piston & turbine engines. 360 built from 1953-66 for civil & military customers	B	40+	3%	5 (1 on loan to museum)	31
Westland	Wessex	Turbine powered version of the Sikorsky S-58. Extensive civil & military use of 380 a/c built from 1957 to 1971	B	50+ incl. static military use	2%	1	14
Westland	Wasp/Scout	Naval/Army helicopter derived from 1958 Saunders-Roe design. Almost 250 built from 1961-72 for UK & other customers	S	80+ incl. static military use	15%	20+	13
TOTALS			B-27% S-49% N-24%	510	34%	92	115

4 BUSES AND COACHES

4.1 History

The first omnibus in the world may have been seen in Paris as early as 1662 when a horse-drawn vehicle was operated at regular intervals for a fixed fare. The first in London was Mr Shillibeer's in 1829, which ran from Paddington to the Bank and carried 22 passengers. Later vehicles were smaller with seats on the roof reached by a staircase. The first motor bus began operating around 1904. Until 1920 designs were an adaptation of commercial lorries, but in the period of rapid development from 1920 until 1927, manufacturers began to design purpose-built vehicles. The next period of rapid growth was after World War II, when there was an expansion of bus services and a steady advance in design. From the mid-1920s until about 1960, Britain led the world in bus development, with Leyland Motors pre-eminent. Since 1970 British bus operators have sourced bus chassis abroad as well as at home and by the end of the century only one chassis manufacturer remained British-owned. More coachwork manufacturers survive. The bus has played a major role in providing rural transport where the local railway could not reach and until the general availability of the private car. It has also played a key role in the development of suburbs around our cities. The coach has enabled large numbers of people to travel long distances cheaply.

Bus preservation was led by London Transport who started reserving obsolete vehicles in the 1930s. Private efforts began in the 1950s. A survey in 1962 recorded 80 preserved buses. Ian Allan's publications are credited with arousing interest and drawing those with a common interest together. From the 1970s the pace has accelerated, made possible by rising living standards and the availability of redundant vehicles at relatively low cost.

4.2 Basic Details

Definition of Category

The defining characteristic of the category is that these are passenger-carrying road vehicles. Buses operate over routes to a timetable with a published fare structure and, as the name omnibus suggests, are available to all. They may be double or single deckers but in towns the former have prevailed. Coaches, normally single deckers, operate longer distances and often on a charter basis. They fall into the following groups:

- horse drawn buses;
- steam buses;
- motor buses (petrol and diesel);
- coaches;
- trolleybuses.

There is some controversy over the inclusion of the last group, as their dependence on fixed overhead wires often causes them to be grouped with trams. However, in most respects they closely resemble the motor bus, and the preservation issues are similar.

Size of Category

There is still uncertainty as to the precise number of vehicles in preservation. The Public Service Vehicle (PSV) Circle publishes a list from time to time, but this depends upon information being supplied. It does, however, cover all vehicles regardless of ownership. The National Association of Road Transport Museums (NARTM) publishes and updates a list of vehicles in museums and collections open to the public, which is therefore more accurate but less complete. Some private owners are reluctant to publicise their possessions, so the numbers here are no more than an informed estimate.

Table 1. Buses and Coaches by Ownership

Type	NARTM members	others
horse-drawn	5	20
Steam	0	0
Petrol	194	280
Diesel	1311	1700
Trolleybus	102	25
TOTAL	1621	2025

The total is believed to be greater than the 3,646 shown above and in the range 4,000 to 4,500. The table shows that 83% are diesel-powered and that few trolleybuses survive. Horse buses are mainly in collections of other horse-drawn vehicles rather than in transport collections. There are no steam buses preserved though some of the parts of one exist in store. The following table shows the vehicles of NARTM members by age:

Table 2. Preserved Buses and Coaches by Year of Manufacture

Year of manufacture	No. preserved
pre-1900	5
1900-1909	2
1910-1919	14
1920-1929	74
1930-1939	156
1940-1949	249
1950-1959	446
1960-1969	422
1970-1979	221
1980-1989	47
1990-present	1

Since a large number of privately-owned vehicles not included above are from the 1970s and later, and in view of the large number of vehicles shown above to be from the 1950s and 60s, it is probable that less than 10% of preserved buses are older than 1940.

Description of Ownership

Rather more than 80% of the 4,000-odd preserved vehicles are privately-owned. Even though some 45% of known buses are in a museum or collection open regularly or from time to time to the public, most are simply on loan from private owners. Rather less than 600 vehicles altogether are fully owned by museums or trusts. The following table breaks down the ownership of NARTM vehicles:

Table 3. Buses and Coaches by Type of Ownership

Owner	No. of vehicles	% of total
Museum	260	17.9
Local authority	40	2.8
Trust	190	13.1
Private company	51	3.5
Private individual or group	910	62.7

Since this is confined to NARTM members it seriously understates the total number in private hands as all vehicles outside NARTM are privately owned.

Associated Infrastructure

The infrastructure associated with this category is in three groups: rural garages, which tend to be small and fairly primitive; bus stations in the form of platforms and signs; and urban garages, which were often originally tram depots and are normally substantial buildings. Few have been granted listed building status, partly because they have not been considered to be of architectural interest, partly through inattention. Furthermore, bus enthusiasts tend to be pre-occupied with their vehicles and finding secure accommodation of any kind rather than with preserving the traditional infrastructure. As a result few survive. With no pressure group active in the field, unlisted buildings are very much at risk.

There is a good example of a preserved rural garage at the Amberley Museum, and there are two excellent examples on the Isle of Man. There is a surviving rural garage at Hindhead in Surrey but many have been lost. Any that become noticed merit examination before they are lost as they are likely to be rare and may be interesting.

Bus stations are also rare and in any case seldom of particular merit either as a historical record or architecturally. There is currently controversy over one in Derby, The best known survivor, significantly modernised, is outside Victoria Station in London. They tend to have occupied valuable sites which have been redeveloped.

Urban garages are more likely to be of architectural interest and so listed but, without a use as a museum or current depot, they too have tended to be redeveloped. As outstanding and listed survivor is at Cheetham in Manchester, home to the Manchester Road Transport Museum. There is also a large example at St Helens, formerly a tram depot, and also in use as a bus museum. Edinburgh also has an interesting example and there is an architecturally important case in current use at Stockwell in South London, with a large concrete span roof. London Transport also have an interesting former tram depot at Acton. Former tram depots are recorded in the Directory of British Tram Depots. With nearly half the preserved buses housed in museums or collections, it may appear that accommodation is not a problem. However, only 83% of the vehicles in museums are stored under cover, and only 30% of the remainder are so privileged. Thus nearly 50% of preserved buses are without proper protection from the weather or other damage.

The very size of a bus or coach calls for a substantial building and, if there is to be room for maintenance work or visitors, each vehicle requires something of the order of 600 sq. ft. Suitable buildings tend to be expensive to maintain and some have the added complication of being listed. If they are in or near centres of population, they are faced with high opportunity values. At least six NARTM members face substantial bills for essential repairs to their accommodation. Those vehicles not in a museum are largely ill-protected under moveable covers or dependent on empty barns and sheds. Currently, accommodation for preserved buses is thought to consist of approximately:

- 44 museums regularly open to the public with full covered accommodation;
- 30 buildings open on request offering reasonable accommodation;
- 50 specially constructed buildings holding 1-10 vehicles, some open on request;
- 150 barns and sheds holding 1-5 vehicles with no public access.

The following table lists the 30 principal museums which are open regularly and which between them accommodate 993 buses and coaches, about 25% of the total in preservation.

Table 4. Principal Bus and Coach Museums

Museum	Location	No. of vehicles
Abbey Pumping Station	Leicester	7
Amberley	Arundel	11
Aston Manor Road Transport	Birmingham	64
Br. Commercial Vehicle	Leyland	6
Birmingham & Midland	Wythall	86
Castle Point Transport	Canvey Island	30
City of Portsmouth	Portsmouth	17
Cobham Bus	Cobham, Surrey	31
Dover Transport	Dover	22
East Anglian Transport	Nr Lowestoft	23
Imperial War	London	1
Ipswich Transport	Ipswich	25
Isle of Wight Bus	Newport IoW	22
Keighley Bus	Denholme	52

Lincolnshire Road Transport	North Hykeham	24
London Transport	London	35

Museum	Location	No. of vehicles
Manchester M. of Transport	Manchester	71
Br. Road Transport	Coventry	7
Transport	Glasgow	3
Science	London	20
N. of England Open Air	Beamish	5
Nottingham Transport	Ruddington	31
Oxford Bus	Witney	58
St Helens Transport	St Helens	92
Sandtoft Transport	Doncaster	53
Scottish Vintage Bus	Lathalmond	132
Sheffield Bus	Sheffield	28
Tameside Transport	Mossley	12
Ulster Folk & Transport	Cultra	10
Wirral Transport	Birkenhead	15

There are in addition about 600 buses accommodated in some 30 collections which are open to the public from time to time.

The quality of the covered storage (where available) varies considerably, and three standards have been defined:

1. The *ideal*, with space for maintenance and visitors and facilities for interpretation to the public. Very few are at this level, the London Transport Museum and 'Milestones' at Basingstoke being outstanding examples;
2. An *intermediate* standard, with modest work space, a pit or jacks, a work-bench, lighting and even heating. This may not be of a high enough standard to allow vehicle exterior painting to be done without much preparation. Access for the public would normally be possible only after clearing out vehicles from storage to make safe passage possible;
3. A bare *minimum* with space for one vehicle only, or for more if crammed together in 'sardine storage' with no space between. Such conditions are found in quite large collections as at Wythall and Cobham and at the West of England Transport Collection at Winkleigh.

4.3 Physical Needs

Storage

Public service vehicles are by their nature all-weather vehicles and are constructed accordingly. Vehicles in regular commercial use and subject to planned maintenance and cleaning are reasonably capable of withstanding the rigours of the British climate, yet even commercial operators invest heavily in providing often extensive covered accommodation in which to house and repair their vehicles. However, once that maintenance and cleaning regime is at an end, deterioration is quick to set in, particularly in the bodywork and trim. Once established, it is expensive to overcome. Standing vehicles deteriorate more rapidly than those in regular use, so it is essential that preserved buses are kept under cover and secure not only from the weather but also from vandals. If so protected it is estimated that a restored bus, used occasionally for special events, will only require significant attention every 15-20 years.

Although, as has been shown, between a third and a half of preserved buses are in some kind of covered accommodation, it is a regrettable fact that there are among the majority stored outside some historically interesting vehicles whose fate is daily becoming more problematic. Conversely not all those stored inside are of equal historical importance.

Conservation

There is a serious need for some preserved vehicles to be restored. Even among those in museums or collections, less than 50% are restored, while of the total it is less than 30%.

Over time it is becoming more difficult to find spare parts. Scrap yards are being cleared, and it is becoming necessary to fabricate new parts. It is reckoned that the average cost of restoring a post 1960 bus is between £5,000 and £10,000, depending on the condition at the start, but this can rise to £60,000 or more for older vehicles. In any case the cost of storage and restoration will exceed the value once restored.

Condition of Infrastructure

As might be expected from what has been said above, the state of the associated infrastructure is very variable. The cost of repairing and maintaining buildings large enough to accommodate and display buses is high and competes with the time and effort required for restoring and maintaining vehicles.

4.4 Documentation

Very few collections of vehicles are recorded beyond a basic listing and general descriptive material, usually as the basis of a catalogue for visitors. There is little documentation of restoration work. As mentioned above, the PSV Circle and NARTM compile lists of vehicles and the latter is published by Ian Allan. The Omnibus Society keeps records of routes and fares. A large number of books have been published about bus manufacturers and operators although, with some notable exceptions, they tend towards being a display of illustrations rather than a narrative resulting from serious historical research such as is commonly found in the case of railways and aviation.

As for archives and smaller items, there is a vast collection of material, almost wholly undocumented, and mainly in private hands. The Manchester Museum of Road Transport alone has some 80,000 books, documents and photographs relating to buses, of which 30,000 have been formally accessioned. They also possess 10,000 small objects. One private enthusiast has amassed a collection of over 100,000 bus-related books, memorabilia and photographs. These and other private collections are at risk in the event of sickness, poverty or death.

With overwhelming and immediate pressures on available funds, the majority of bus collections have little or no resources which can be allocated to provide appropriate standards of storage for anything other than vehicles. Archive collections are invariably stored in private houses and consequently access to archives is virtually impossible outside the few major museums. Some progress has been made by the larger museums in cataloguing archives and small objects, but much remains to be done.

4.5 Human Resources

Umbrella Organisations and Museums

A number of organisations exert a unifying influence on what could otherwise be a very fragmented category.

- NARTM (National Association of Road Transport Museums) was founded in 1981 and represents preservation groups and museums which specialise in the whole field of road transport, but its membership emphasises the preservation of buses and coaches. It represents organisations rather than individuals and fulfils a strong networking role that encourages mutual assistance in practical restoration and the provision of storage. It has 33 members;
- BBPG (British Bus Preservation Group) was formed in 1990 and represents the private bus owner and operates fairly informally as an action group to identify and rescue vehicles at risk by finding them owners and accommodation. It has 650 members;
- NFBCP (National Federation of Bus and Coach Preservationists) was formed in 1997 as a lobbying group. As such it does not get involved in preservation;
- PSV Circle was founded in 1949 and is concerned with recording bus technology and the movement of vehicles between owners and operators. It compiles the most comprehensive list of preserved buses currently available, and has over 2,000 members;
- HCVS (Historic Commercial Vehicle Society) is mainly active as an organiser of meetings and rallies with a preponderance of vehicles other than buses. It represents the category on the FBHVC (Federation of British Historic Vehicle Clubs), an international and political lobbying organisation;
- The Omnibus Society, founded in 1929, records bus companies and their public services.

The very number of these organisations is evidence of the still fragmented structure of bus preservation. The category suffers from having a credibility gap with key decision-makers and opinion-formers and, unlike railways and aircraft, but preservation has not yet escaped from the popular conception that it is a niche activity for eccentric enthusiasts. A body akin to the Historic Railway Association for railways would project the value and importance of conserving this significant aspect of our heritage, balancing the private owner's fears of outside control and direction with the benefits of a co-ordinated approach, by applying delicacy of touch and diplomacy.

There is also a gulf between the established museum sector and private preservationists. This has been bridged in a few instances largely by individuals who have perceived the need for closer collaboration, notably from within the Science Museum and the London Transport Museum. There is thus a need both for a stronger co-ordinated leadership from within the category, and for greater communication between the public and private sectors.

Work-force and Skills

Substantial contributions are made to bus preservation by individuals, acting alone or in groups. In the Manchester Road Transport Museum alone several hundred man-hours a week are provided free. It is thought that across the country there are around 2,500 active preservationists and over 20,000 enthusiasts interested enough to participate from time to time and to read the two principal journals of the category, *Buses Magazine* (18,000-20,000 copies sold monthly), and *Classic Bus Magazine* (10,000-12,000 bi-monthly).

Bus enthusiasts are concentrated in London, West Midlands, North West and North East England, the Central Lowlands of Scotland and Belfast. Coach enthusiasts are fewer and more scattered. Most enthusiasts are thought to be aged over 35 with a reducing number below that age. Younger enthusiasts show more interest in the later vehicles. The chief motivation above all remains a desire to save buses for the future, although without much consideration of longer term sustainability. Some fear that the trend towards more modern vehicles will put at risk older vehicles of historical importance, but eventually as these more modern vehicles outstrip the resources of their owners to maintain and keep them operational, they too will risk abandonment and sale. There is thus a need for the category to marshal its resources and to present a more informed and attractive image to the world.

The skills required vary with the age of the vehicle. Older vehicles call for blacksmiths, carpenters and upholsterers. Later examples require skills with fibreglass, plastics and electronics. Most of these skills are self-taught or learned by example, with much pooling of knowledge and collaboration. Specialists tend to be needed for work on fuel pumps, injectors, radiator re-builds, and tyre replacement. Specialist contractors exist associated with the commercial vehicle industry.

No consideration has been given to training requirements, probably because so far the need has not arisen. As with other forms of historic transport, this is likely to become a problem unless there is sufficient stimulus by demand.

4.6 Public Access

As mentioned above, about 25% of preserved buses are on display in museums open regularly to the public, and a further 15% are accessible from time to time. Not all buses on display are restored, as some smaller museums put everything on display 'warts and all'. Visitor numbers are not readily available, but both the Manchester Road Transport and East Anglian Transport museums attract some 12,000-13,000 people a year. While some buses and coaches are on display in mainstream museums such as the London Transport Museum and the Glasgow Museum of Transport, these are in a minority.

Many privately owned-vehicles are mainly seen by the public at rallies such as the London-Brighton Commercial Vehicle Run and the Pennine Run, organised by the HCVS. They also appear at a vast number of summer shows, rallies and 'crank-ups', normally in association with other vehicles such as tractors, steam engines, old cars, and military vehicles. There are also special 'running days' when historic buses are operated in towns, sometimes contracted to a bus operator and fare-earning. Public access causes wear and can cause damage, and in time the most precious vehicles will

no doubt have to be kept out of physical contact; by then, though, duplicates, replicas and eventually interactive technology should be available as alternatives.

Little is being done in this category in the form of education. Priorities are more focused on basic restoration. Little use has been made of computer technology, although some museums are creating web-sites. The main opportunities for the use of this technology will lie in the area of cataloguing collections, publicising collections on the internet, and eventually for interactive exhibits.

4.7 Funding

This is largely private, with individuals funding not only restoration but also accommodation and its maintenance. Some income is obtained from TV and film producers, but this tends to be hard-earned. In a few cases local authorities have supported museums. The Lincolnshire Road Transport Museum has recently received grant aid for a new building, and the Manchester Museum of Road Transport receives its building rent-free, although with little security of tenure. HLF has made a grant to the Oxford Museum for a new building and workshop, and the Science Museum's Prism Fund has been a notable source of support for vehicle restoration. But because so many preserved buses are privately-owned there has been little support for the category for public funds.

4.8 Prioritisation

No system of grading yet exists and, moreover, the task of identifying a register of preserved buses is incomplete. However, largely as a result of the previous Transport Trust paper and accelerated by this one, efforts are being made by seven experts under the auspices of NARTM to produce a satisfactory formula. The need for such a process is recognised for the following reasons:

- to minimise the risk of important vehicles being lost through disregard;
- to focus available funding on the most important restorations;
- to minimise the risk of important vehicles being inadequately housed or displayed;
- to ensure that regional significance is not overlooked;
- to enable privately owned vehicles of importance to be acquired by trusts for the future.

The formula being pursued initially considers the following characteristics and places a value upon them:

- typical of type or manufacturer;
- typical of region or locality;
- typical of a particular operator;
- last or only example of type;
- particularly good example of type;
- illustrates significant step forward in design or technology;
- embodies feature or component representing such step forward;
- exhibits noteworthy constructional technique;
- of a design unusual, rare or unique;
- embodies a feature or component that is unusual, rare or unique;
- in unusually good or complete condition;
- proportion of original components;
- associated with important national event or figure;
- associated with important regional event or figure;
- associated with particular social or planning strategy.

The sum of the resulting scores would place the vehicle in one of three grades A, B, and C, which might together contain about 750 vehicles, some 18% of the total in preservation, with 100 of them in Grade A. Each grade would imply certain restraints and benefits which have yet to be defined. They would include the extent to which a vehicle should be operated and provided with aid to ensure safe accommodation.

4.9 Summary of category needs

The key needs of the buses and coaches category are

- the completion of a category register of preserved buses as a prelude to introducing a grading system acceptable across the category which takes account of regional variations;
- a strategy for accommodating at least the most important vehicles under cover. At present 50% of all preserved buses are stored in the open;
- the conservation of the most important vehicles, especially by private individuals, including workshops and secure weathertight accommodation;
- facilities for improved public access and education;
- improved co-ordination and representation of the category;
- an archive capable of receiving and eventually sifting collections of papers, ephemera and small artefacts which might otherwise disappear or be inaccessible to the public.

5 RAILWAYS

5.1 Basic Details

Definition of Category

The first railway locomotive to be deliberately preserved was probably the Canterbury & Whitstable Railway's 'Invicta', which was put into store by the South Eastern Railway in the late 1840s. The government first became involved in preservation in 1857, when artefacts collected for the Great Exhibition were sold. They were placed in the new Museum of Ornamental Art in South Kensington, which was subsequently split into the Science Museum and the V&A. Following the Stockton & Darlington Centenary celebrations in 1925, the LNER established a Railway Museum in York in 1927.

Individual enthusiasts entered the ring in 1951 when for the first time a whole railway was taken over by a private association of enthusiasts with the object of preserving it. This was the Talylyn Railway, a narrow gauge mineral line in west Wales. Others quickly followed as the pace of British Rail closures accelerated through the 1960s. These enthusiasts created what are now known as Heritage Railways, and own all the heritage railway infrastructure and much of the rolling stock in the UK. However, some important vehicles are owned by museums and private individuals.

Heritage Railways are those railways excluded from the Railways Act 1993. They are characterised by being operated for their own sake, and not to carry out a social obligation, remunerate shareholders, or generate profit. They consist of the following:

- railways operating timetabled trains, between more than two stations;
- railway or steam centres based around a station or operating yard;
- railway museums, some of which may operate trains over short distances.

Some of these are recognised as museums by Resource. In addition, there are other historic railway collections and activities:

- some national or local authority museums contain railway relics, principally locomotives, but also historically important infrastructure such as Monkwearmouth Station in Sunderland;
- historic trains run on the commercial railway system. In Ireland this is the principal enthusiast activity, while in Scotland it has become part of the international tourist package.

Size of Category

a) Infrastructure

There are 427 miles of operating heritage railway in the UK and 570 stations. They can be broken down as follows:

Table 1. Numbers and Mileage of Heritage Railways

Type of heritage railway	Standard		Narrow guage	
	No.	Miles	No.	Miles
Typical of period before 1923	6	51	10	104
Typical of period 1923-1964	16	118	-	-
No particular theme	15	46	14	35
Industrial lines	4	8	2	5
Greenfield sites	2	1	5	8
Railway centres with theme	7	6	5	6
Railway centres without themes	19	24	6	3
Railway museums with operations	5	-	-	-
Railway museums without operations	-	1	-	-
Wide interest museums with some railway assets and operation	9	7	9	3
Wide interest museums with some railway assets	9	-	1	-
Total	100	261	53	164

b) *Steam locomotives*

About 1,143 steam locomotives have been preserved. Of this number about 50 are on static display in museums on account of their age and rarity. Of the rest no more than 400 are operational at any one time because of the high cost of maintenance, especially boiler overhaul. In fact, on 1 January 2001 only 143 had a valid boiler certificate of which only 25 were certified for running on the commercial railway. This requires a higher level of performance than a preserved railway. About 90 have yet to be restored to working order. The high cost of restoration and maintenance and the difficulty of matching a locomotive's characteristics to the work required is why there are locomotive shortages from time to time. The main characteristics of existing steam locomotives is represented below.

Table 2. Numbers of Steam Locomotives in Preservation

Standard gauge				
	Pre-1900	1900/1923	1923/1948	post-1948
Express	15	8	60	5
Freight	12	16	55	9
Mixed traffic	-	2	82	52
Branch/shunters	39	13	29	12
Industrial	45	91	163	107
Total	111	130	389	185

Narrow gauge		
	Pre-1923	post-1923
Under 2 ft.	87	85
2-3 ft.	22	19
over 3 ft.	28	10
Total	137	114

Broad gauge		
	Pre-1923	post-1923
7 ft.	1	-
5 ft. 3in	4	3

Total	5	3
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c) *Diesel*

About 700 diesel locomotives are preserved. Most of the classes ever used are represented, and some are of a class still in operation on the commercial railway. Of the total, 192 are main line locomotives and 518 are industrial or shunting engines. 40% are in working order. Most heritage railways now welcome diesel engines, either as a regular source of power or on certain special days.

In addition 233 motor and trailer cars survive in diesel multiple units (DMUs). Their popularity and suitability have earned them a place as a back-up and alternative to steam services. Most are spread around the country on heritage railways but four are in museums. The Railcar Association acts as an umbrella organisation for these vehicles. Although mainly operated as revenue earners, the time will come when conservation as a historical record will have to be considered.

d) *Electric*

This is something of a 'Cinderella' group as the only heritage railway with electric power supply is on the Isle of Man. Therefore the only opportunity to run the surviving Southern Electrics and London Transport trains is on the busy lines of the commercial railway. The London Transport Museum has a good collection, but the surface railway electrics are not so well represented.

Electric locomotives were not generally favoured in Britain but the National Railway Museum (NRM) has an early North Eastern Railway example of 1904 and a few of the later British Rail types survive, together with an unusual collection at Tanfield of industrial types from various countries, and a sole survivor from the Metropolitan Railway, still in working order, and owned by London Underground.

Around 20 electric motor and trailer cars survive. The following are among the more important:

Liverpool Overhead motor car	In store, Liverpool
LSWR suburban motor car	NRM
Southern 'Nelson' motor car	NRM
Southern 2 car BIL unit	NRM owned, but stored privately
Southern double deck motor car	private
Central Line train	private, operational
LMS motor car	NRM
LNWR motor car	NRM
NER motor parcels van	NRM
various London Underground	London Transport Museum
Scottish battery multiple unit	Aberdeen
'Brighton Belle' motor car	Sheringham

e) *Carriages and wagons*

3,372 carriages are registered in the Carriage survey, which is nearing completion. Of these 2,813 are standard gauge of which 922 are of earlier manufacture than 1948. Some 500 are wooden vehicles and therefore prima facie of historical interest. The balance of 559 are narrow gauge and a small number of Irish broad gauge.

Some 2500 obsolete freight vehicles are thought to exist. Of these some 1,700 are covered and open wagons, 400 are non-passenger carriages, and 200 are a miscellaneous collection of various vehicles such as snow-ploughs. A small but uncertain proportion are in a restored condition.

f) Cliff railways

These are mostly funicular railways built largely for tourists but also for places where, as at Bridgnorth in Shropshire, an unusually steep hill intervenes. They include cliff elevators which are in a sense a vertical railway. Most were built to be powered by water but were converted to electric power early in the last century. Only Lynton is unaltered; Saltburn and Folkestone remain water-powered but have modernised pumping equipment. Eight originated in the 19th century. Machynlleth is a modern water-powered system dating from 1992. Altogether over 20 survive and are in operation; the oldest is the South Cliff Tramway in Scarborough which, as a town, has three cliff railways. Bournemouth also has three. The remainder are scattered around the coasts of England and Wales with one on the Isle of Wight.

Ownership

a) Infrastructure

Most real property is held on lease or freehold by railway companies or preservation societies. In some cases local authorities, conscious of the potential benefits to local tourism, have bought the track-bed of a railway and sub-let it to a railway company. In most cases there is both a railway operating company and an enthusiasts' society which will normally hold a proportion of shares in the operating railway company. The enthusiasts' society will normally have charitable status, and act as a source of volunteers and other support. The company employs staff and operates the trains. Sometimes the society owns the real property. Capital for investment in developing lines is raised by voluntary donations, sometimes by a share issue of the company. There is a tendency for such companies to adapt their articles of association to prohibit the return of the shares to the shareholders in the case of liquidation and to prevent payment of dividends. This is to avoid being barred from HLF funding.

b) Locomotives

Some railways own both the infrastructure and the vehicles and have continued to do so as locomotives and carriages have been added. Other railways have followed a more varied pattern. In some cases the railway or the society have acquired locomotives and carriages, but in most cases they are owned by private individuals or groups. There are at least 170 such groups whose locomotives may be closely associated with one railway or may be made available for hire, either by heritage railways or by rail charter operators who run special excursion trains on the commercial railway for enthusiasts. Some of these groups are formally established as trusts, but others rely on less formal understandings. Owners normally require the operating railway to carry out all maintenance of the leased locomotive, and the rate for short-term hire is typically about £350 a day. Most owners, however, are enthusiasts whose objective is to have their locomotive in operation.

Among the museums as locomotive owners, the National Railway Museum has a policy of allowing certain locomotives to be hired for active use on both heritage and commercial railways.

c) Carriages and wagons

These are mostly privately-owned, although the larger railways tend to collect whole trains in order to be able to present a unified ensemble and museums have some important examples.

d) Archives

Those archives not owned by the Public Record Office, county record offices or museums are owned privately by individuals and the railway operating companies. There is also an unknown but large amount of railway ephemera and minor artefacts, sometimes collected by the heritage railways, but more often privately and stuffed into the spare bedrooms and attics of private houses, and therefore at risk in the event of poverty, sickness or death.

Infrastructure

More than is the case with the other three categories, the railway is a complete entity consisting of not only track and trains but also stations, structures such as bridges and tunnels, signalling installations and engine sheds. It also extends to works and associated housing. Many of these items are considered as part of the built heritage and over 800 items are listed as of historical or architectural importance.

Consideration is being given to nominating a whole railway, such as that from Bristol to London, as a UNESCO World Heritage Site.

Ownership of these items, some of which are redundant, lies mainly with Railtrack, as successor to British Rail. All are the responsibility of the Railway Heritage Trust, set up in 1985 as an independent body funded from various sources including British Rail and now Railtrack. It has done a very good job in identifying repair and restoration needs and securing funding. It has recently, with Heritage Lottery Fund support, found funds to restore the listed station building at Stone in Staffordshire. Other items are owned by London Underground and other railways, including heritage railways and individuals.

Since the demolition of the old Euston Station in 1965 there has been a change in the climate of opinion about early and meritorious railway structures. This awakening has been assisted by the Ian Allan Heritage Awards, supported by the Heritage Railway Association. London Underground and others have become very conscious of their responsibility. However, in spite of this change of climate there remain risks because structures are mainly dependent for survival on public funding. Most of these items have little commercial justification and listed building status is ultimately their only security. That has proved insufficient in the case of at least one station (Chirk).

The fragmented nature of heritage railways has resulted in the creation of a far denser infrastructure than existed when they were part of a whole system. Adequate shed and workshop facilities have had to be built and stations adapted. Most railways have gradually been extended as funds have allowed, and this has often been a rallying point for enthusiasts. The Bluebell's gradual approach to East Grinstead, the gaining of Bodiam by the Kent and East Sussex, access to Bolton Abbey by the Embsay are

all cases where either a population centre or a tourist attraction, or the need to have an attractive length of line have led to extensions. There is, however, a point where extension no longer remunerates the investment. The West Somerset with over 20 miles is unusual; normally the price of a ticket obtainable from a tourist will not rise in direct proportion to distance and a shorter mileage has in most cases been found to be optimal. Thus the North Norfolk with only five miles of track is one of the highest earners per mile.

An important part of the infrastructure is the signalling system which on all heritage railways is of the traditional mechanical interlocking block system, controlled from boxes with levers. As computers take over the commercial railway signalling system, these systems remain as important historical relics.

5.2 Physical Needs

Storage

The greatest need is for vehicle storage. Locomotives are more resistant to the effects of weather, but, whereas a wooden carriage should be under cover when already restored or when awaiting attention, all need cover during restoration work. At present only 14% of all carriages are stored under cover. Most of the historic carriages are of wooden construction and at least 70% of these are inadequately protected by tarpaulins and need proper cover. One cause of this is the number of interesting old carriage bodies which have been found in unlikely places, but the main problem is the size of accommodation required for, say, a rake of five 60 ft. long carriages.

It is less difficult to find places to keep small artefacts and archives. Many railways mount displays of railway associated artefacts at stations or in 'museums'; archives find their way into cupboards on and off the railway, sometimes in private houses. It is desirable that they be located near the railway as that is often where researchers expect to find them, but county record offices are becoming very short on space and there is a need for a central store where records can be placed for sifting, rather than disappearing unsorted into skips and bonfires. The benefit of such a process can be seen in the case of steam engines, many of which have survived and are in useful service having been placed in transit in the scrap sidings at Barry and somehow never reaching the torch. Another example is at Tanfield in Durham where a large and somewhat indiscriminate collection of north eastern rolling stock and locomotives was assembled and is now being prioritised.

Conservation

a) Locomotives

The restoration of locomotives has been driven either by enthusiasm for the locomotive itself or by a need for motive power on a particular railway. Little attention has been paid to prioritising effort. As a result there are several classes of locomotive of which many identical examples survive. One third of all the GWR 'Manor' Class locomotives ever built are still intact; as a light-weight mixed traffic locomotive they happen to be useful on short preserved lines and a number happened to reach the scrap sidings at Barry.

Even when a locomotive has been restored it requires expensive maintenance, the mandatory boiler certificate being a particular burden. The 7 or 10-year boiler overhaul costs between £40,000 and £200,000. This tends to cause a low order of priority to be given to historically important locomotives if they lack ideal performance characteristics. Up to £400,000 can be spent on a major locomotive restoration and up to £250,000 to carry out a major overhaul. The 'Flying Scotsman' cost exceptionally over £1 million. Even assuming that the present number of operational locomotives is sufficient to operate today's railways and the heritage trains on the commercial railway, some 15-20 boiler certificates are needed each year at a total cost of £1 to 2 million a year.

The so far unrestored locomotives, mainly from Barry, include examples which will be expensive to restore, and most are of types already represented. They do however offer opportunities for increasing the stock of operating locomotives and for conversion to historically more important classes. Didcot's conversion of a GWR 'Hall' into a 'Saint' is a good example of this (see 7.7 RESTORATION). There is an interesting idea afoot to convert some of the unrestored ex-Barry locomotives in store in Cardiff into three types of ex GWR 'County' class locomotives.

Before long locomotive boilers will begin to reach their age limit and new boilers will have to be made. At this point the role of the replica could become crucial. The Class A1 Pacific 'Tornado' currently under construction privately is an interesting precursor. This initiative has the particular merit of producing a locomotive equipped with the latest technical requirements to do the task on the main line, without having to adapt a historically important locomotive. 'Tornado' can be regarded as the natural development of a famous and important locomotive class reflecting what would have happened anyway if steam engines had continued to be operated on the main line. This is the same argument as that used to justify adapting heritage locomotives for main line working, but without the complication of balancing curatorial concerns.

b) Carriages and wagons

Vintage carriages have tended to receive low priority attention as most railways find it more convenient to use modern former BR steel vehicles, which are more tolerant of the weather. There is, however, increasing interest in the value of earlier carriages, especially when mounting a genuinely historic travelling experience. The recent Railway Heritage Register Carriage Survey has highlighted the need for restoration and accompanying storage. A typical carriage restoration by a private individual costs perhaps £20,000, up to £50,000 for a more elaborate case.

Wagons have been at the end of the queue but the start of charter trains for photographers and the recognition that goods trains and vehicles were an important element in the traditional railway scene have revived their prospects. They have the merit of being a good place for less experienced hands to gain experience.

In view of the historical importance of the electric train, steps should be taken to widen the collection of later carriage types in safe keeping and in working order. The restoration of the world's first electric all Pullman car train, the 'Brighton Belle', to

full working order could have interesting commercial possibilities in addition to re-creating a unique train.

Condition of associated infrastructure

All passenger carrying railways must comply with standards laid down by HM Railway Inspectorate. Passengers expect heritage railways to present a well kept appearance and in general they go to great lengths to ensure that their stations present an attractive face to the public. Outstanding in this regard is the Keighley and Worth Valley. Some, like the North York Moors and the Mid-Hants, deliberately present the style of a specific period; others, like the North Norfolk, make special efforts to maintain the track in good condition. The burden of maintaining the infrastructure is heavy, costing up to 10% of all operating costs. All railways have the burden of cost associated with bridge repair and, from time to time, some are faced by exceptional costs such as the repair of flood damage. Some have begun to tackle the typical eyesore of so many heritage railways in the form of collapsing carriages and rusting materials lying by the side of the track.

5.3 Documentation

Documentation of items

Locomotives have now been recorded systematically in publications which are regularly up-dated. Carriages and wagons are still being registered in the survey referred to above under Conservation.

Archives

The Public Record Office has an outstanding collection of the minute books and other files of the railway companies in existence until 1948, together with some private collections of photographs and memorabilia. County Record Offices also have relevant local railway history records. The National Railway Museum has a notable collection, as do other railway museums, and the heritage railways have collections with varying curatorial standards. The low priority given to funding this function means that the process is far from ideal, records are fragmented and at risk to the whims of individuals, and many things just disappear. For the commercial railway the Railway Heritage Committee has a statutory function in identifying archive material which should be preserved, but there is a limit to the capacity of the Public Record Office and county offices, and a central store will shortly be desirable. Combining this function with the preservation of an important but redundant transport building would be an attractive solution.

Research

Railway history has probably been more extensively researched than any other transport category, as demonstrated by the number of railway books and magazines available. Although many are superficial picture books, there are many carefully researched studies which leave little uncovered. The late Professor Jack Simmons at Leicester University gave an inspiring lead, and recently an Institute of Railway Studies has been set up at York University.

5.4 Human Resources

5 apprenticeship schemes exist and the Transport Trust initiative to create Heritage Skills Workshops is making some progress. The Swindon Museum workshop will shortly be training 12 students from the local college.

Most railways now have a web site and an officer responsible for public relations. Railways normally produce quarterly journals interspersed with increasingly more frequent internal newsletters to keep their scattered staff informed. The six or more national railway periodicals are hungry for news and constantly on the look out for a scoop. As a result the railway fraternity are well informed about developments. Places where tourists gather have an array of heritage railway timetables and most railways operate an automatic telephone enquiry/response service.

5.5 Public Access

Railways are the most accessible of the transport categories - for those wishing to be active participants, for visitors, for the casual bystander and for educational purposes. They offer a range of opportunities for enjoyment including shops, dining, travel, idle onlooking, research and photography. Most are open at summer weekends, many operate every day for much of the year. Most shut down in January and February. Provision for the disabled is widespread. Many railways have close local associations with education - the West Somerset, for example, has served as a location for a GCSE study task. This is an area of potential growth, although the adaptation of buildings and in some cases new buildings will be required.

One area of the railways often not open to the public, but nevertheless a source of great interest with potential for further development, is the workshop and maintenance facility. Legislation imposes constraints on public access to these places and it is therefore an area of access which tends to be expensive to provide and of lower priority to railway management than train operation. Enhanced provision of intelligent interpretation facilities is a general need, and the opportunity should be taken to include it in building adaption and refurbishment programmes.

Most railways now use ICT for internal communication and accounting, and nearly all have a website. The Leighton Buzzard narrow gauge line experienced 4,000 hits and a 20% increase in passenger numbers when it opened a website, though this was only one part of an improved marketing effort. There is much scope for a more widespread use of ICT in museums, archives and on railways but such developments tend to be of low priority compared with economic survival.

5.6 Funding

There are five principal sources of funds:

1. share issues. For example, the West Somerset Railway raised £450,000 in one issue to purchase its track. The South Devon Railway is currently seeking £2 million in this way. Such shares are usually unredeemable and earn no dividends;
2. covenant schemes, now gift aid, to cover the cost of a particular project, a locomotive boiler, a line extension, a signal box and, in one enlightened case in Norfolk, to accumulate funds for the next boiler overhaul;
3. train fares, including meals in dining cars, shop sales, and special events. Across the country this amounts to some £30 million a year. The average cost of a visit to a railway is less than £4 a head including travel;
4. film makers. This can be worth as much as £1,000 a day to a railway;
5. capital grants from local authorities, the Rural Development Commission, the Heritage Lottery Fund, and others such as the EU Social Fund. Few revenue support grants have been made.

5.7 Prioritisation

None exists in a formal sense apart from the listing of some railway buildings (e.g. Barrow Hill Engine shed, which is listed Grade II). Registration is well-advanced (see Documentation above) and on completion of the Carriage Survey, it is intended to start a process of identifying the most significant vehicles. A similar process will follow for goods wagons. Grading schemes have been introduced ad hoc. The National Railway Museum and the Great Western Society at Didcot have produced formulae which they apply for their own purposes. Tanfield has also made a sophisticated grading of its collection, including the locomotives, steam, diesel and electric, and the carriages. As a railway focused on the Newcastle area, its locomotives receive a point score if they are for instance built locally, if they have particular associations with the area or if they represent a technical development of the area.

Some are wary of attempting to grade the importance of locomotives, but it is clear in the context of this report that the nettle has to be grasped, and electric trains, carriages and wagons should be included. An example of how steam engines might be graded is put forward as follows:

Eight characteristics each worth subjectively awarded points:

A.	Sole survivor of class.....	4
B.	Earlier than 1923.....	4
C.	Early example of its class.....	3
D.	An innovative design.....	4
E.	A rare example of a designer or manufacturer's work.....	3
F.	Of significance to its location.....	1
G.	Based at a railway with strong heritage character.....	1
H.	Of importance to a collection.....	1

An even thornier issue is the grading of whole railways. While grading individual buildings, locomotives and rolling stock would assist the prioritisation of grant aid, the essential character of a heritage railway is the entirety of the experience - vehicles and infrastructure. Some offer a much more historically authentic experience than others. In order to balance income with running historic trains, some only run vintage trains on certain occasions. Some make little or no attempt to be historically authentic and offer a hybrid which, although an enjoyable experience, has no historical merit and owes little to the heritage. The following is put forward as a basis for grading whole systems:

Six characteristics each worth one point:

- A. At least 75% of original infrastructure has been retained or authentically recreated.
- B. At least one steam-age non-industrial locomotive steamed regularly.
- C. One steam engine of a type used on the line is regularly based on site
- D. Period carriages form part of regular trains.
- E. Complete period trains are operated.
- F. Good locomotive and carriage storage facilities.
- G. Good interpretation facilities

Slightly different criteria might be applied to narrow gauge or industrial lines.

5.8 Summary of Category Needs

The popularity of railways and in particular of steam propulsion, even among children, would suggest a bright future, provided the quality of the presentation and access to it can be maintained in competition with other attractions.

The key needs of the railways category (in no order) are

- a grading system covering vehicles and whole railways would help to focus funding on the most worthy;
- safe access for the public to workshops and sheds would increase visitor appeal;
- covered accommodation for restoration work and carriage storage, not forgetting electric trains, would improve work quality and output and reduce deterioration;
- support for private enthusiast restoration projects including locomotive maintenance would be cost effective and increase capacity;
- enhanced visitor and educational facilities at stations would improve their educational role and raise the quality of the presentation to the public;
- archive storage would reduce the loss of priceless records.

6 MARITIME (SMALLER SHIPS AND BOATS)

This category is fragmented and diverse, and embraces vessels too small to be covered by the National Historic Ships Committee (NHSC) study (which deals with ships over 40 ft. LOA or 40 tons), although there is a small degree of overlap. Vessels in this category of historic interest have in most cases already been identified, formally or informally, though without ranking, and Class Associations exist for most groups. One or two have begun to attempt some degree of prioritisation. Heritage Afloat was set up to represent these various classes as a trade organisation similar to the role played by the Heritage Railway Association (HRA) for railways.

A number of maritime museums, both public and private, are spread across the country. Of these the National Maritime Museum (NMM) is pre-eminent and has identified for itself a role as leader and co-ordinator of the whole maritime category. It is now custodian of the Large Ships Register and is setting up its own collection of smaller vessels at Falmouth. Most maritime museums do not specialise but have a broad range of historic craft. Where they include larger vessels, these tend to dominate public and management attention. Important craft are also to be found in museums not dedicated to maritime matters, but primarily reflecting local activities of which shipping or fishing may have been part.

Boat-lovers tend to be strongly individualistic and independent minded. They are often for many reasons unwilling to have their ownership widely known, and they are wary of interest from the public sector. Most smaller craft are privately owned, although sometimes on loan to museums, and many are members of one or more class associations. Most enthusiasts want to sail their historic boats and many carry out much of the restoration work themselves.

To make digestible the review of this disparate category, marine craft have been split into classes largely derived from these specialist umbrella organisations. The wide differences between the classes is felt to justify the somewhat cumbersome result. The main potential gap which this approach risks creating is where geographical influences have predominated over class of vessel. There may also be lacunae around the NHSC cut-off level. To attempt to estimate the number of boats of all types extant in Britain would not be productive. Whether it is a quarter or half a million does not affect the needs of historically important craft, of which there are probably about 500.

Infrastructure

The physical facilities associated with smaller vessels are largely the same as those for the larger. Lighthouses tend to be protected if at all by listed building status. Naval dockyards such as Chatham and Portsmouth, commercial harbours such as Bristol, Liverpool and Hartlepool, specialist fishing ports like Ramsgate, Anstruther, Great Yarmouth and Grimsby, and countless small harbours around the coast have often been recognised as worthy of preservation in the context of the towns and cities where they probably played a major part in the historical development. Such facilities are often dependent on local authorities though parts of them may be protected by listed building status and Chatham Dockyard has received significant support from the Heritage Lottery Fund.

More specialised facilities exist for some smaller craft such as lifeboat stations, canal locks, aqueducts and basins, and rowing club-houses. These are protected mainly by listed building status and local enthusiasts, though most of the inland waterways infrastructure is under the care of the British Waterways Board, ultimately dependent on HM Treasury. As ever, the need outstrips the funds.

Associated infrastructure

As a system of transport the inland waterways, like the railways, rely upon their own discrete infrastructure. A mutual dependence therefore exists between the vessel and the waterways, as between the train and the railways. Navigable rivers were the earliest means of water transport but both canals and navigable rivers came to play an important role in the early days of the industrial revolution and, until the mid-19th century, were the principal means by which goods were transferred as raw materials or as finished products. The extended waterway system therefore enabled the industrial revolution to take place.

Although the navigable rivers now are more important as water drains than as a medium for transport, remarkably much of the canal infrastructure is still in place. The canal infrastructure is often charmingly secluded in quiet corners of busy towns and cities, often of local architectural and social importance, and sometimes of industrial and engineering importance as well, as in the case of lifts, flights of locks and aqueducts. Most of the canals were bought up by the railways when the speed and security of the railway train superceded them in the middle of the nineteenth century. They are thus now largely owned by the state through the British Waterways Board, which was set up in 1948 at the time the railways were nationalised. Unlike its rail counterpart, British Waterways recognised the importance of its heritage from the outset. Its role is both as owner and as regulator.

Condition of infrastructure

The canals and river navigations probably have a brighter future now than at any time in the last century. Although there is still a back-log of maintenance required, this is now recognised by the government and is being tackled. As a result the inland waterways are now in a better shape than they have been for many years. They are now seen as a national asset to be treasured and developed with care. The revival of derelict waterways is dependent on major sources of funding, but public support seems to be at an all time high, particularly following the realisation of grants for the Huddersfield Narrow Canal and the Scottish Millennium Link.

6.1 Canal and Inland Waterways Commercial Craft

Definition of category

This class includes working boats from the navigable waterways and canal boats. There were six major types of vessel designed for the broad waterways, the first and oldest of which were built for river work (on, for instance, the Trent and Severn), normally with a minimum beam of 14 ft. Such vessels were known as barges, keels or trows and were powered by large and impressive sails on the lower reaches. Up river they were often hauled by horses or even teams of men with the tow-rope lashed to

the mast. On and around the lower Thames were spritsail barges. Also found on the rivers were craft called lighters which, unlike a barge, had no accommodation and were for short-haul work.

On the larger canals with locks wider than 7ft., such as the Bridgewater, the Leeds & Liverpool and the Grand Union, the vessels, various types of barge, were normally termed wide boats and had a beam of between 7 and 14 ft. There were important regional variations. Towards the end of the 18th century when it became desirable to penetrate hilly country and in so doing to conserve water at the many locks, canals were built with locks no wider than 7 ft. 3 ins. The vessels used on these canals were termed narrow boats and were possibly developed from the underground mine boats on the Bridgewater Canal at Worsley. Narrow boats now form the vast majority of surviving historic craft; indeed, very few other craft have survived, having been broken up when they became rotten with age. There are, however, in addition a variety of maintenance craft, pleasure launches, and small so-called tub boats for towing.

The NHSC cut-off point can lead to confusion in this class as most vessels are within a rather narrower range of dimensions, over 40 ft but under 40 tons.

Size of category

There are over 27,000 privately or commercially owned boats on the British Waterways section of the inland waterways and as many as 106,000 across the country if rivers such as the Ouse, Thames and Nene are taken into account. Very few wider boats survive, but there are said to be some 800 so-called historic narrow boats extant, of which about 300 were all built for the Grand Union Canal in the 1930s. Not all are members of the Historic Narrow Boat Owners Club (HNBOC). 100 are wooden, the last being built in 1957. Probably rather less than 100 of the total are of real historical importance and grading is in hand. The HNBOC has drawn together information on all its members' boats from its archive and is gradually computerising it. The following table summarises the Historic Narrow Boats and gives an indication of the proportion of boats which may be worthy of listing.

Table 1. Historic Narrow Boats

Type of boat	No. built	Total Extant	Pre-1930 survivors
BUTTY			
Wood	1000	10	1
comp.	150	100	20
iron	100	80	-
MOTOR			
wood	200	20	2
comp.	250	200*	30
iron	150	150	-
INSP. LAUNCH	10	4	2
TUGS			
wood	50	6	-
comp.	10	10	2
iron	20	20	-
JOEY (coal carrier)			
wood	10,000	3	-
comp.	40	20	20
iron	1,000	200	-

TOTAL		SAY 800	77
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* includes 20 steam

Ownership

The Waterways Trust is the biggest single owner with some 60 vessels at Gloucester and Ellesmere Port. The importance of its collection has been recognised through designation by the Museums and Galleries Commission (now Re:source). The British Waterways Board has a small collection as does the Wooden Canal Boat Society. All other owners are private. The Commercial Boat Owners endeavour to keep commercial cargo trade in operation on the waterways.

Storage needs

Although Inland Waterways craft are basically weatherproof, some of the oldest boats which are no longer suitable for putting into the water need covered accommodation. It would seem sensible to locate this at a focal point which could combine workshop and visitor facilities. Ellesmere Port looks an attractive choice.

Conservation needs

There is a need for selected boats of prime importance, in both private and public ownership, to be conserved. In the absence of a grading system across the board the following is an indication of need:

- a) The Waterways Trust has established what it calls a 'core list' of 17 historic vessels: 8 broad craft, 6 narrow boats and 3 container boats. Only one of these is privately owned; the remainder belong to museums, the Boat Museum at Ellesmere Port owning 8. The Trust estimates that £1 million and £42,000 annual maintenance is needed to conserve and preserve this core collection. This 'core collection' has not been assessed by comparison with other vessels and reflects only the view of the Trust, although there is no indication from the private sector of any dissent;
- b) development of a workshop and storage facilities at Ellesmere Port;
- c) revenue cost support for ongoing maintenance work on important craft whether private or publicly owned.

Documentation

British Waterways and the Historic Narrow Boat Owners Club have full registers of craft.

With regard to archives, the picture is untidy but because British Waterways is a public body an archive exists, albeit scattered, and a mechanism is in place for retaining much current material. It is proposed to consolidate the British Waterways archives at Ellesmere Port. Another part of the extensive archive is scattered in local record offices, local libraries and regional British Waterways offices. Some earlier material is in the Public Record Office together with the railway records. It would be valuable to assemble and catalogue the British Waterways material and put it on line so that the whole can be accessed from any one location, but it is hard to assess the benefit of this against general conservation needs and against the need for finding a home for current hard copy archive material.

The archive of the Railway and Canal Historical Society is particularly rich in photographs. The history of inland waterways is fully recorded in many books and periodicals.

Human Resources

Four parties play a role in preserving historic waterways craft: the British Waterways Board itself, the Waterways Trust and its Boat Museums, the Wooden Canal Boat Society, the Historic Narrow Boat Owners Club and the Commercial Boat Owners. As an owner of historic waterways craft, British Waterways is occasionally involved in preservation, dependent largely on the enthusiasm of its regional staff, particularly in the Midlands and North West Regions. However, the infrastructure of the waterways and the boats themselves are integral to each other and the Midland Region has made a bid for around £300,000 of HLF funds to conserve and operate 10 vessels, all narrow boats, with a largely educational purpose, emphasising the social and industrial importance of the canals in the context of the history of the West Midlands. The vessels are clearly an integral part of the total picture.

The Inland Waterways Association is an independent charity which exists to support inland waterways. Set up as early as 1946 it raises funds from membership and by holding special events. It is not itself an owner of assets, although it does own a narrow boat which it uses for promotional purposes. Rather less than 50% of its members are boat owners who obtain benefits such as reduced insurance premiums. A trading subsidiary, the Waterways Recovery Group undertakes practical canal restoration work with volunteer labour. In addition, there are about 100 individual canal supporting associations.

The British Waterways Board has established a semi-independent trust called the Waterways Trust (TWT) which seeks sponsorship and grants from other trusts to support the work of the Board, and has taken over the three museums of the canals at Gloucester, Ellesmere Port and Stoke Bruerne. As such it has become an important owner and operator of historic craft.

There is in addition a rare Wey Navigation 75 foot barge, the 'Perseverance', in the collection of the Museum of Docklands. The Historic Narrow Boat Owners Club is the organisation representing the interests of private owners of historic craft.

This class of vessels enjoys an enthusiastic strategic management from the museum sector and its objectives are quoted as an example of how other classes might move. If others do not follow there is a possibility that this class will obtain grant aid simply because it articulates its needs so well, and not necessarily because it is more worthy.

The Waterways Trust is keen to co-ordinate efforts to operate historic vessels and to enhance the promotion and interpretation of inland waterways' history to a wider public. Its objectives as drafted are:

- to show boats in action to the widest number of people, loaded and unloaded, travelling by horse, diesel and steam power;
- to display boats static where they can no longer be justified in use forming a true National Collection and capturing the true heritage of the inland waterways;
- to work with partners to demonstrate working techniques and operations, to show on video, as a record, and to act as events and media opportunities;
- to establish maintenance and construction facilities based on historic buildings and centres which can be accessible to the public to show historic boats under restoration;

- to research, record and archive historic boat types and construction and to carry out archaeological investigation of sunken and buried boats;

- to carry out education programmes with boats and encourage the training of volunteers in their use and maintenance;
- to develop all means to make information available via museums, exhibitions, rallies, publications and web-sites;
- to build replicas for specific programmes, recordings and special events.

To achieve this level of co-ordinated activity there is seen to be a need for

- a coordinating body to list all working boats and barges along with their capabilities, and the opportunities they bring;
- a list of all societies, museums, companies and individuals with historic craft;
- agreed minimum standards to define historic craft;
- agreed inclusion of historic pleasure, passenger and maintenance craft;
- co-ordinated boat movements, historic rallies and historic components of large events.

This seems to be an admirable initiative and one which others might consider following, but it is important that the private sector also articulate their views and participate, thereby contributing to a broad based policy.

The Inland Waterways Parliamentary Group has strong support from MPs and meets twice a year. The Inland Waterways Association is a well supported and respected pressure group.

There is an adequate supply of private firms, enthusiastic individuals, and an active museum sector to enable the perpetuation of skills. The Waterways Craft Guild is a valuable resource. But it is important that the existing skills be passed on and that young people find opportunities in boat yards and workshops to acquire these skills. There is evidence that changes in the funding of training in the last twenty years have adversely affected this process. Canal boats have a relatively high metal and mechanical content and there are signs that a lack of appropriate apprenticeships is creating a scarcity of the skills required. This also applies to up-stream materials and components and practices like iron making need to be perpetuated to ensure that traditional items such as rivets can still be made. Stimulation of demand is likely to be more effective as a means of perpetuating skills than supply-led motivation, although a level of basic training is needed.

The growing and substantial popularity of boating on the inland waterways and canals would suggest that there will continue to be support from the public.

Public access

The Inland Waterways Association holds an annual festival at different locations. In 2000 it was held at Waltham Abbey and was attended by 35,000 members of the public. Some 18,000 boat owners and supporters, and 300 boats were assembled. Other rallies are held all over the country by the IWA's 35 branches and most of the 100 Canal Associations also hold rallies. Up to 50 historic boats attend these rallies, which attract members of the public. Revenue cost support for historic boats attending rallies could encourage even wider representation than at present.

Present funding

Present sources include the British Waterways Board, Resource and the Heritage Lottery Fund. Private individuals cover the maintenance and restoration of most historic craft.

Existing prioritisation

The British Waterways Act 1995 required all licensed boats to have third party insurance, a permanent mooring, and a boat safety certificate. Old boats were to be exempt from certain safety standards. These boats were to be identified on a register to be set up by a committee called the Historic Working Boat Group (HWBG). The resulting British Waterways Historic Boat Register is based on boats older than 1948. The definition of historic craft requires that they be relevant to the inland waterways heritage, substantially in authentic structural condition and well maintained. This, however, may not be sufficiently rigorous in order to ensure and to grade importance.

The Historic Narrow Boat Owners Club disputes the date 1948 and suggests instead 1962, as this would include the last boats built for commercial freight operation. There is also disagreement as to whether boats with a full length cabin should be included. This proposal is opposed by British Waterways on the grounds that such boats cannot have been in the same condition all their working lives. The register so far contains about 270 boats, a further 100 having been rejected. British Waterways estimates that around 600-800 boats would qualify.

Attempts to use the Historic Working Boat Group to achieve a co-ordinated approach to listing have faltered. Progress on the register is slow, partly due to a lack of motivation to participate because British Waterways offers a flat 10% discount on mooring fees for old craft which meet their criteria. Also, less valuable butties (towed and un-motorised) are charged the same mooring fees as the more valuable motorised boats, and this leads to their destruction or conversion. The Historic Narrow Boat Owners Club would prefer to see a variable discount and grading by characteristics such as historical merit, rarity, original materials used, unconverted etc. as this, it is felt, would do more to encourage the preservation of historic craft. To this end it is engaged on its own register of historic craft.

The Waterway Trust's 'core list' is quite separate from the vessels identified by the National Historic Ships Committee and only one vessel, 'Peacock', is on both the Waterways Trust's and NHSC's 'core lists'. Another, 'Friendship', is both 'designated' and on the Waterways Trust list. The Waterways Trust core list is part of a collection which amounts in total to some 60 craft owned by the Boat Museum, but there is little correlation between this and the NHSC list.

Priority of need

The greatest need for funds appears to lie at present with the preservation and conservation of a relatively small number of craft (perhaps no more than 20), in enhanced boatyard facilities for ongoing maintenance, and in revenue cost support for the maintenance of working boats. Improving record retrieval within the British Waterways system of archives may be lower down the list of priorities. There is a widely held opinion that funds for maintenance are as important as covering one-off costs of restoration.

Prioritisation

Present attempts to prioritise have been independent by the Waterways Trust, British Waterways and NHSC with little involvement of the Historic Narrow Boat Owners Club. There is a need for an objective process with a degree of transparency and representation from various bodies which would enable all historic craft in both public and private ownership to be evaluated. At present private craft do not appear to be sufficiently considered, perhaps because they are less well known. The Historic Boats Working Group criteria offer a starting point but the Steam Boat Association formula has some advantages. The Transport Trust is engaged in facilitating such a process and in the first instance has asked the Historic Narrow Boat Owners Club to make a list of any craft they consider at least equal in merit to those on the Waterways Trust and NHSC lists.

An objective process might reach the following conclusion, or something like it:

- GRADE 1 - Part of the 'core list' of vessels owned by the Waterways Trust plus some boats owned by British Waterways and some privately owned, a total of perhaps 25. They and the next grade could be identified as the 'National Collection'.
- GRADE 2 - This would embrace a wider number, perhaps 50 of less critically important craft but reflecting regional variations.
- GRADE 3- A wider group reflecting special functions like dredgers and pleasure launches.

Graduated standards of curatorial practice would be appropriate.

6.2 Classic Motor Boat Association (CMBA)

Definition of category

This is a broad grouping of powered craft, normally at least 25 years old, all of which have some claim to being of historical interest even if their importance is less clear. Most are racing boats and speed boats but there are also more leisurely river launches and some electric and steam boats. Some, particularly racing boats, are of foreign origin. There are a number of comparisons with collections of classic, vintage and veteran cars.

Size and Ownership

It is difficult to estimate the extent of the category, but certainly it goes beyond the 300 boats owned by the 200 members of the Classic Motor Boat Association. The 300 registered boats are privately owned except for about 25 in the National Motorboat Museum at Basildon, which is municipally owned and the only one of its kind in the world. The museum has a collection policy based on sports and leisure which is appropriate to its location in a municipal park. 40% of vessels at Basildon are on loan from private owners.

Physical Needs

Speed boats are notoriously vulnerable to neglect once their useful life is thought to be over; engines are removed to power other boats and the hulls are left to rot. Most craft are looked after conscientiously by their enthusiastic owners in accommodation provided by them. However, as with private cars, there are cases where owners become sick or impoverished and where items become at risk. The need will arise in the future for some owners to sell their vessels, at which point accommodation of the most important will become an issue. The only publicly owned store is at Basildon which is not large and is obliged to adopt a restrictive and selective policy over the accommodation of craft. There are a few craft in the class in other maritime museums such as the NMMC and at the small private Motor Boat Museum at Newport on the Isle of Wight. Specialist restorers for this type of boat are rare outside the Thames and East Anglia.

Documentation

The Classic Motor Boat Association and the Museum at Basildon have documentary records of many of the craft. The only archive is at Basildon which contains manufacturers' records and drawings and a collection of magazines dating back to 1899. Everything is catalogued and some of the records are on computer.

Human resources

This large class of boats has a small infrastructure of private individuals who originally gathered together to protect their right to use certain lakes against the mounting opposition of the 'green' movement. The Friends of the Museum at Basildon and the Classic Motor Boat Association overlap in membership and are the focus of research and campaigning. The Friends have an influence on the collection in the museum. The Association is the main mouthpiece for the class. Basildon is a recognised centre of knowledge for the class. There is a strong following for this type of boat which is likely to continue.

Public Access

The class faces a problem of access to water to hold its rallies, races and speed trials. Environmental pressures and Health and Safety are restricting events, locations and public involvement. In spite of this the Classic Motor Boat Association hold several rallies at Fritton in Norfolk, Loch Lomond, and six events at Windermere where the annual British Classic Motor Boat Rally takes place. This will have to cease after 2005. In contrast, other EU countries, which are less observant of Brussels-imposed rules, welcome these rallies as a tourist attraction and even grant travel subsidies. The Basildon Museum, which is not easy to find on account of being badly signposted, receives some 14,000 visitors a year, but its boats do not enter the water. These boats have a potential attraction to the public which is not being fully exploited.

The use of ICT has not been developed.

Funding

Activity in this class is privately funded except for the Basildon Museum, which is owned by the local authority. Although there have been concerns in the past about the quality of support given to the museum and some criticism of disposals of boats from

the collection, the position at present appears stable. The museum is applying for recognition by Re:source and the local authority is backing this.

Prioritisation

There is no formal prioritisation, although it is generally accepted that there are 40 or so craft which are, to quote one authority, 'of mouth-watering interest'. Some of them are at Basildon. This is a clear case of a class which could benefit from an objective listing system, partly because some of the craft are not old and their importance not immediately obvious, and partly because interest in the class is regarded by some as being out of the mainstream. There has been little motivation hitherto but, as remarked above, if important vessels come up for sale, listing could suddenly become critical. The collection of craft at Basildon, and especially the collection of outboard engines, is unique outside the USA. It therefore warrants evaluation as a collection.

6.3 Dunkirk Little Ships

Basic details

This is a group of about 147 vessels whose sole common characteristic is their involvement in the evacuation from Dunkirk. 49 are less than 40 foot but only eight are over 40 tons. Some are of historical importance as vessels; some could be included in other classes as fishing boats or classic motor boats. Their importance, however, is primarily as a group and for their historical associations. Nearly all are powered by motor. 12 of the 147 vessels were built earlier than 1910 but three of these are over 40 tons, and six are lifeboats. Ten are based abroad, the rest being scattered around Britain, with at least 30% in fresh water. All are individually harboured with only two in museums or collections (at Ramsgate, and the Imperial War Museum). Most are privately owned, with only six owned by a trust. There is no associated infrastructure.

Physical needs

Most are maintained by their owners. The Dunkirk Little Ships Restoration Trust was set up in 1990 and exists to restore vessels. It is privately funded and has so far restored two. At least two interesting vessels are in need of take over and restoration by the Trust. There is a hope that resources can be successfully pooled by participation in the proposed boatyard and harbour at Marchwood on the Solent.

Documentation

The Dunkirk Little Ships Association has fairly brief records of the vessels participating at Dunkirk. Other records are at the Imperial War Museum and the Public Record Office.

Human resources

The Dunkirk Little Ships Association was founded in 1967 following a 25 year anniversary reunion sponsored by the Sunday Times in 1965, in which 12 vessels took part. Since that time the activity has grown steadily. Dunkirk is the object of a reunion sail every five years, with intermediate events annually. It is in essence a club for seafarers who happen to own vessels with a shared history. As such it

has shown vitality and an appeal to succeeding generations. There is no formal training provided.

Public access

The Little Ships enjoy wide media coverage of any activity in which they participate, and they draw large crowds. The return to Ramsgate from Dunkirk in 1995 was welcomed by a crowd covering every part of the harbour. The Association participates in Navy Days at Chatham and Portsmouth and 15-20 vessels take part in the annual Thames Traditional Boat Rally. The list of members is computerised.

Funding

The funding has hitherto been exclusively private.

Prioritisation

No attempt has been made to prioritise vessels for their historical importance. Some of the larger vessels such as the 'Massey Shaw' Fire Boat, the 'Medway Queen', MTB 102, and 'Challenge' were reviewed by the NHSC but only MTB 102 was nominated for the 'core collection'. The 'Medway Queen' and 'Challenge' were 'designated'. The Heritage Lottery Fund has recently funded the restoration of 'Challenge' with a £274,000 grant. The Trust owns an interesting Essex cockle bawley 'Resolute', which is in need of restoration. Because of the strength of the public following, this loose collection of vessels should not be overlooked. Based on age the following at least may eventually merit listing:

- 'Cachalot' a cutter 1900
- 'Falcon II' schooner 1898
- 'Jane Hannah' lifeboat 1910
- 'Patricia' ketch 1910
- 'Vere' RN pinnace 1905
- 'Viscount' motor yacht 1908
- 'Willdora' MFV 1901

6.4 Fishing Boats

Definition

Fishing is one of the basic and traditional industries of Britain with the variety of catch and sea conditions leading to a wide range of methods and therefore boats. The rapid collapse of the British fishing industry since 1950 has left a number of comparatively modern craft at risk to the breaker's torch, indeed the government at one time encouraged their destruction by insisting that compensation to fishermen made redundant as a result of governmental decisions would be paid only if their boats were destroyed. This was replaced by a government scheme to save vessels, subsidising the leasing of them to individuals expressly not for fishing. This was in cooperation with the 40+ Fishing Boat Association and Heritage Afloat. There are now over 500 older and traditional craft with strong regional and functional characteristics, mainly privately owned and used for leisure or non-commercial fishing. Most of these are less than 40 tons deadweight, have sails and are afloat. It is on these that this report focuses.

Size of category

Some 550 vessels have been registered by the 40+(years)Fishing Boat Association, which itself has a membership of about 220 vessels of all ages. About 10% of the craft on the register are also members of the Association. Over half the vessels on the register are older than 1910, and perhaps 50 are of historic and documentary importance as an example of a regional and functional type. The following table summarises this register of older boats by region, with a breakdown showing those more than 90 years old.

Table 2. Fishing Boats by Date

AREA	TYPE	PRE 1910	OTHERS	IN MUSEUM
Devon/Cornwall				
	Lugger	14	40	3
	oyster	16	6	-
	trawler	3	8	-
	Plymouth hooker	6	4	-
	crabber	3	5	1
	Polperro gaffer	7	2	-
	quay punt	5	4	-
	others	10	6	1
	TOTAL	64	75	5
Irish Sea				
	Manx nobby	3	1	-
	prawner	27	54	2
	Aberdaron	2	9	-
	Llangwm compass net1	5	-	
	Lune whammel	4	2	2
	others	3	8	
	TOTAL	40	79	10
Channel				
	Itchen ferry	20	10	1
	Hastings lugger	-	2	1
	Ramsgate tosher	-	2	-
	punts	1	4	5
	other	1	5	1
	TOTAL	22	23	8
North Sea				
	Essex smack	29	-	-
	Bawley (shrimp)	8	5	-
	Yarmouth shrimper 2	3	2	
	oyster smack	22	6	-
	coble	-	5	2
	Lowestoft drifter	3	2	-
	Lowestoft trawler	3	3	-
	Grimsby trawler	2	-	-
	Hull trawler	1	-	-
	Boston smack	3	1	-
	Whitstable oyster	4	-	-
	others	13	8	2
	TOTAL	90	33	6

AREA	TYPE	PRE 1910	OTHERS	IN MUSEUM
Scotland				
	fifie	2	9	1
	zulu	2	17	2
	bauldie	1	4	-
	yawl	-	3	2
	other	-	25	1
	TOTAL	5	58	5
GRAND Total		226	326	34

Ownership

Nearly all are privately owned; less than 10% are in museums.

Associated infrastructure

With the decline of the Museum of Fishery at Grimsby, the only location currently devoted to this type of vessel is at Anstruther in Scotland which has also had some financial problems. There is a small museum of lesser craft on the front at Brighton and another at Fleetwood. Such vessels as are in other museums are merely part of diverse collections, such as that at Great Yarmouth. Grimsby will remain but with only three vessels, all over 40 ft.: 'Perseverance' a 1914 shrimper, 'Esther' a trawler of 1888, and a 1957 side-winder trawler 'Ross Tiger'. 'Esther' is at risk and in need of conservation but was 'designated' by the National Historic Ships Committee.

Physical Needs

There is a need for havens, although boats are so scattered that this will be difficult to achieve and needs to be tackled across the vessel classes. Existing havens such as Grimsby, Anstruther, Falmouth, Liverpool, Great Yarmouth or Lowestoft would be appropriate. Minor locations such as Maldon, Brightlingsea, Penzance, St Ives, Fleetwood, Preston and Aberdaron offer possibilities and strong local associations, but their longer term viability must be in question. Most of the craft in museums are out of the water. Private vessels depend on local moorings.

There is a need from time to time for conservation on a certain number of vessels. Most effort hitherto has been private, but the Heritage Lottery Fund has supported conservation of two Scottish types, a fifie and a zulu.

Documentation

None has been collected in a structured way. Much is scattered in relevant County Archives though there are some archives and a library related to the fishing industry at the Fishing Museum in Lowestoft and at Anstruther. The archives from Grimsby are now with the municipal gallery.

Human resources

The 40+ Fishing Boat Association is the only organisation interested in promoting the preservation of historically important fishing boats as a class of vessel. It has a computerised register of over 500 vessels. There are other smaller local associations and several hundred former fishing boats are 'Old Gaffers'. This is probably the area with the greatest risk of double counting.

Fishing boats are to be found in a number of the maritime museums around the country, from Great Yarmouth to Newcastle and Shetland but, with the decline of the museum at Grimsby, Anstruther becomes the main dedicated collection. This is the Scottish Fisheries Museum, affiliated to the National Museum of Scotland, but independently owned and funded in part by the Fife council and the Scottish Executive. They have 16 boats, two of which are on the 'core list', 'Reaper' and 'Lively Hope'. Most of their boats are sea-worthy but out of the water, except for 'Whitewing' and 'Reaper'. Retired volunteers carry out some conservation work in the boatyard, but most is done by shipwrights from Arbroath with funds available from the EU under the fisheries rationalisation program. The museum has a collection of fishing baskets which is now pre-eminent and is a good example of how smaller items can acquire importance through being in a collection.

Most of the privately owned craft are maintained by their owners.

Public Access

There is little formally available except at museums. The Register is stored on computer.

Funding

Funding is largely private. Anstruther has recently been given financial assistance by the Scottish Executive. Grimsby is dependent on the local authority.

Prioritisation

There has been none to date, due to numbers, geographical spread, private ownership, and a lack of motivation. There are probably about 50 boats of some historical importance and it would be a pity if boats were lost through inattention. Fortunately six are on the National Historic Ships Committee's 'Core List' and 18 are 'designated', but most vessels are below the NHSC limit. The owners of this class of boat are probably the most independent-minded within this category and this, combined with strong regional loyalties, presents the greatest obstacle to planned support. On the other hand, the interest and national historical importance of the class argue for patience and awareness and the support of efforts to set priorities. Anstruther exercises a degree of prioritisation in deciding whether or not to accept boats offered to the museum. However, the current informal and unstructured advice from experts could be made subject to a points scoring formula and subsequent grading.

6.5 Lifeboats

Basic Details

These are all former Royal National Lifeboat Institution lifeboats. Most are outside the National Historic Ships Committee criteria, but two are on the 'Core List' and four are 'designated'. The total number of past and present RNLi boats is recorded at 1,265. The first 600 or so were pulling boats, most of which have disappeared or have been converted. The first powered lifeboats were steam propelled, but sadly none of the six built survive. 180 boats are currently in operation by the RNLi and 200 are known to have been lost, either at sea, by enemy action or broken up. 56 have been sold overseas. Of the remaining 800, about 300 have quietly disappeared,

converted beyond recognition, or sunk. Most of the 500 probable survivors in the UK are owned by private individuals, many having been converted for leisure use, but 42 are on display in museums. The largest single collection is the 11 boats owned by the RNLI at the Chatham Historic Dockyard.

Some of the boats in museums are under cover and well protected. Some are still sailed, and self-righting craft need to be kept out of the water if used in order that water can drain from the tanks. The museums involved are: Chatham, Charlestown, Southwold, Moelfre, Milford Haven, Buckie, Wells, Littlehampton, Cromer, St. Davids, Barrow, Sheringham, Walton, Irvine, Duxford, Marchwood, Reading, Dublin, Basildon, Newport (Isle of Wight), Hartlepool, Valentia, Whitby, Hythe (Southampton), Poole, Swansea, Harwich, Ulster and Redcar.

Physical needs

Covered storage is desirable and funds are needed to conserve a selected few boats.

Documentation

The Lifeboat Enthusiasts' Society keeps an impressive computerised record of all lifeboats and endeavours to keep track of them. The RNLI has its own archives.

Human resources

The supporting organisations tend to be more interested in the historical record than conservation. Private boatyards do most of the work on conservation and private individuals and the museums play a key role in support. Newport (Isle of Wight) in particular has restored one important boat with volunteer labour and is restoring another. This is a popular class of vessel and is likely to continue to be so.

Public access

Lifeboats have a strong public appeal and hence they are well displayed around the country. There are many opportunities for exhibitions of the associated bravery and heroism. The RNLI is itself one of the largest charities in the UK with a strong membership even inland. The Register is stored on computer.

Funding

Funding is largely from private sources, but there has been support from the government and from the Heritage Lottery Fund.

Prioritisation

There is none formally, although the enthusiasts know which craft are most historically interesting and a listing system could be introduced. However, many boats are preserved and available to the public in museums so the need has not been pressing. The following are put forward as worthy candidates for the top ten and these at least warrant conservation and accommodation funding. The list is not exclusive.

‘Queen Victoria’, a pulling boat sold by the RNLI in 1902 now at Newport

‘Selina’, a pulling surf launched boat sold in 1923 and now at Newport awaiting restoration

‘Langham’, sold in 1952, an early motor boat now at Newport

‘Bedford’, a pulling boat sold in 1939 and now at Southwold
‘Alfred Corry’, a pulling/sailing boat built 1893 at Southwold (‘Core list’)
‘James Leith’, a pulling boat sold in 1932 and now at Chatham
‘James Stevens No.14’, sold in 1928 and now at Walton (‘designated’)
‘Jane Anne’, sold in 1928 and now at Irvine under restoration
‘Lady Harrison’, sold in 1951 and now at Marchwood
‘Lizzie Porter’, a pulling boat, sold in 1936 and now at Chatham

In addition ‘Jesse Lumb’, a twin screw boat of 1939, is at Duxford and is on the ‘Core List’. Three others, ‘BASP’ at Chatham, ‘HF Bailey’ at Cromer and ‘Trimilia’ (a Dunkirk Little Ship) are ‘designated’. Perhaps about 20 vessels would merit listing as historically important, although regional associations may in some cases argue for more.

6.6 Military Boats

Basic details

These are mainly powered but some are with sail or oars. All were originally commissioned by the Royal Navy, the Royal Air Force, the Army, the Police or HM Customs but have been sold. Most are World War II vintage or earlier and most are located between the Wash and Plymouth. Most are below 40 foot in length. A few were included in the National Historic Ships Committee survey, and two are in the ‘Core Collection’.

Of Royal Navy craft there are over 1,200 known survivors in various states of health. However, there are 12 privately owned important craft which are being given some standard of care, and a similar number in museums. Of these ten are ships’ boats of various kinds, four are harbour launches, three are pinnaces, and one is a landing craft.

174 Royal Air Force craft survive, but only 9 are in museums. Of these three are airborne lifeboats and three are seaplane tenders. 250 Army craft survive, with 4 saved in private hands and 3 in museums. 40 Police craft and 30 Customs craft survive in varying states and most are post WW II.

Ownership is mainly private. Some are owned by museums such as the Imperial War Museum (HMS Belfast), the British Military Power Boat Trust (BMPT), the Maritime Workshop, the Royal Naval Museum, and Chatham and Portsmouth dockyards. Apart from existing major museums, which tend to concentrate their efforts on larger vessels, the principal location is the newly established museum at Marchwood near Southampton, which is owned by the BMPT. This has plans to develop the site as a joint maritime and air museum, where opportunities for public education will be available.

Physical needs

There is a need for covered storage for working on these craft and to house them in winter. Marchwood offers a short-term solution, but longer term it will need to be upgraded. Volunteer skilled labour exists.

Documentation

This class is among the best documented. The British Armed Forces Small Craft Research Group (SCG) under the World Ships Society has computer records of every surviving boat and much of their history, together with 10,000 photographs. There are also records for the Royal Navy at Bath, at the RAF Museum at Hendon and at the Thames Division, Wapping, of the Metropolitan Police.

Human resources

The Small Craft Research Group and British Military Power Boat Trust are the focus of knowledge, interest and enthusiasm and the source of the drive to conserve. The BMPT stands out among umbrella organisations for its purposeful and enthusiastic leadership. The role of Marchwood as a focal point is proving to be crucial as larger museums tend to focus on larger craft. Skills still exist in boatyards and privately. The appeal of many of these craft suggests a continuing interest in both conserving and enjoying them. Publicity will be enhanced as a centre is developed, whether at Marchwood or elsewhere. The drive to support this class of vessels is very much privately led.

Public access

Public access is through participation in big naval events and rallies and availability for hire. Marchwood could provide a strong educational and public facility.

Funding

Funding mainly comes from the private sector.

Prioritisation

There is no formal prioritisation, although the 40 craft in museums and private care represent a core. The Small Craft Research Group are proposing to develop a list using the Steam Boat Association formula. Two vessels are in the NHSC 'Core list'; MTB 102 and HSL 102.

6.7 Old Gaffers

Basic details

These are gaff-rigged sailing boats built before 1960. There are about 2,000 pre-1960 registered gaff-rigged boats of which some 30 to 40 are large enough to fall within the NHSC study. One third were originally fishing boats. Two thirds are located between Harwich and Poole, nearly a third in the West Country and the balance in small groups in Ireland and North Wales. They are all privately owned by real enthusiasts. There is no unified infrastructure and the boats are kept at individual moorings or in marinas.

Physical needs

Low cost moorings would be welcomed. There is a tendency for owners to moor in France where costs are lower.

There are a number of good yards around the coast of the UK but a scheme similar to that in Denmark, Holland and Germany where the government supports museum-based workshops would be welcome and serve to strengthen the role for hands trained in wooden boat skills. Currently maintenance and restoration is privately funded. Generally, when one of the more important of these boats has needed restoration work and has come up for sale, a purchaser has been found who will do the work, but there is a fear that this will not continue.

Documentation

The Old Gaffers Association has records of 3,000 gaff-rigged craft of all ages held on disc. In addition it has an archive of material on builders, designs and craft history.

Human resources

The Old Gaffers Association has 16 regional groups and is active in arranging shows, rallies and races. So successful has it been at this that it now has Bermuda-rigged craft and even motor launches among its membership, which extends to Eire and France.

There is felt to be enough talent available and continuing to come from the three colleges at Lowestoft, Lyme Regis and Falmouth, but demand and available jobs tend to draw the skilled artisan away from wooden hulls to work on hulls made of glass reinforced plastic (GRP). There is some spin off of jobs and skills from the work on expensive international racing yachts, much of which continues in this country.

Public access

Old Gaffer sailing boats frequently take part in Navy days and other public events such as races and rallies. As active sailing craft, they are best enjoyed by crew members or as part of larger nautical events.

Funding is from private sources.

Prioritisation

None exists at present, but an attempt is to be made using the Steam Boat Association formula. This could be important especially if historic vessels come up for disposal in a weak market. There are probably at least 20 strong candidates for priority listing among these craft which are actively sailed and generally well maintained. 'Olga', a much rebuilt pilot cutter, made the National Historic Ships Committee 'core list' and there are at least five on the 'designated' list.

6.8 Steamboats

Basic details

This class is easily identified as being boats powered by steam. Many are modern and most are for leisure. Some are of a size covered by the National Historic Ships Committee. Many have been through other power sources, electric and motor, and have had varying uses. Those of historical importance are a small proportion of the total but are among the most important and attractive of all historic craft. Some of the best examples are former Royal Navy cutters or pinnaces.

There are about 350 British craft on the Steamboat register. Of these nearly half are small pleasure boats built in the last 20 years and as yet of little historical importance. Another 50 are modern adaptations of older boats and therefore lack authenticity. Another 50 have old hulls with steam propulsion inserted at a later stage. About 50 are at least 90 years old and in their original condition although, like many boats, they may have been adapted over the years before being restored, sometimes quite recently, to a painstakingly accurate resemblance to their original manifestation, with frequently the original type of engine. Of these roughly half are in museums. Some 10% of vessels in the register are within the NHSC terms of reference.

Most are privately owned. Around 20 are owned by museums, the largest owner being the Windermere Steamboat Museum. Bristol, Henley, Portsmouth, Hartlepool, Basildon, and the Waterways Trust are also involved.

The various museums mentioned above are the principle locations providing accommodation for steamboats. Most are in the care of their owners. The restoration facilities are with boat builders around the country, but in this class of boats Windermere and the Maritime Workshop at Gosport have been pre-eminent.

Physical needs

The fine construction and use of wood for most of the older vessels call for covered accommodation. There is also a need for moorings secure against both weather and vandals.

Accommodation in boat museums covering a range of boats is ideal and locations can be identified where the need is concentrated, namely Windermere, the Thames, and the Solent/Portsmouth. It is also desirable that workshop facilities are adjacent. Private enthusiasm has driven the remarkable restorations that have been made and steam is as appealing in the boating context as on the roads or railways. There is never as much funding available as many would like, but so far much has been achieved with minimal public support. The financing of the workshop activity tends to be delicate, influenced by changes in government support for youth training in traditional skills. Workshop facilities tend to be makeshift and there is never enough covered accommodation.

Documentation

The Steamboat Association of Great Britain (SBA) produces an illustrated Register of steamboats. This includes its members' boats, some of which are overseas, and notable boats whose owners are not members. These tend to be the larger vessels and those owned by museums. The first edition appeared in 1970 and the seventh edition has just been issued.

The Steamboat Association and the museums have some records. Noteworthy are Windermere and the Waterways Trust museums. The desire of museums to computerise their records may be of lower priority than providing storage for raw data.

The Steamboat Association has pretty full documentary records which are summarised in the Register.

Human Resources

The Steamboat Association is the umbrella organisation for this class and is a source of enthusiasm, expertise, knowledge, and advice. The Windermere Steamboat Museum is an important centre of knowledge and excellence and has some of the most important vessels in the class. However, its museum function is not profitable and it has to boost its income by other activities. In spite of offering boat trips on the lake and having most of its exhibits afloat it has seen a decline in visitor numbers.

Private individuals provide most of the effort of restoring and maintenance. The appeal of steam evidenced by the large number of new boats in the register argues for the sustainability of this level of interest. Private enthusiasts and professional

boatyards have provided the high quality workmanship carried out hitherto. Noteworthy is the Maritime Workshop at Gosport. Windermere maintains skills in both wood-work and steam propulsion. The Kew Bridge Steam Museum carries out commercial boiler and engine repair work.

However, there is a general fear that the traditional wood and metal-work skills are not being adequately passed on to the young. The Maritime Workshop which has trained many young men has difficulty in keeping itself financially afloat due to changes in government policy towards training over the years.

Public Access

The annual Thames Traditional Boat Rally, the Thames Regatta, the Portsmouth Navy Days, and other shows and rallies are occasions for these boats to be seen by the public and the Windermere Museum holds an annual steam rally.

Public access and information could be enhanced by havens combined with workshop facilities modeled on Windermere, though the finances would almost certainly be problematic if other classes of boat and even other types of transport were not included.

Funding

The class is currently sustained almost exclusively by private funds, with some support from the museums involved.

Prioritisation

The Steamboat Association has embarked upon a scheme of prioritisation based on that used by the National Historic Ships Committee.

Steamboats are sometimes included in other classes and there are also a number which are within only one of the NHSC criteria. Taking a strict cut-off point, there are about 20 vessels of less than 40 foot which are not included under Military, Thames Traditional or Inland Waterways craft and which on the basis of age or score on the draft SBA formula appear to be candidates for listing.

6.9 Thames Vintage Boat Club (Thames Traditional Powered Boats)

Basic details

These are pleasure craft built for use in the Thames region. They are mainly powered by motor and there are probably about 600 in existence. 160 of them attend the annual Thames Traditional Boat Rally, the qualification for which is that the boat be built in traditional materials, by traditional methods. This excludes ply-wood but includes iron and steel if riveted; ferro-cement is a topic of debate. The age range is from 1870 to the present. Perhaps 25 are historically interesting or even important. Nearly all are privately owned. Many of those less than 30 ft. are put onshore over the winter in sheds or under canvas; larger vessels remain at moorings. These are either private or in marinas.

Physical needs

Moorings are under pressure as the Environmental Agency seeks to maximise its income and a shortage of space in boatyards means that it is difficult to

accommodate vessels in need of restoration. Conservation is privately funded. Boatyards offering the traditional skills are also under economic pressure of high rates and alternative land values.

Documentation

The Thames Traditional Boat Rally has details of participants and some of their history. The Thames Vintage Boat Club also has full records of the boats of its 350 members.

Human resources

The Thames Vintage Boat Club provides advice and a focus for the preservation of skills and expertise. The role of the Traditional Boat Rally in bringing together a wide range of boats is of great significance. It is the biggest event of its kind in Europe and provides a valuable focus for diverse interested parties. There are boat-building schools and commercial boatyards but the activity is privately funded and rests on the strong interest in boating among the more wealthy.

Public access

These vessels are very much part of the river scene and as such tend to be taken for granted by the larger crowds who use the river. There is a long social boating season on the Thames which attracts crowds and offers the possibility of income from hiring boats out for entertaining. The Thames Traditional Boat Rally attracts 2-3,000 people a year.

Funding

This class of boat is largely sustained by private funding, with some commercial sponsorship.

Prioritisation

To date, no attempt has been made to prioritise vessels as there has been little motivation. Three made the National Historic Ships Committee 'designated' list but most are too small.

6.10 Thames Traditional Boat Society (Thames Wooden Un-powered Boats)

Basic details

This group of craft consists of various types of wooden boat powered normally by oars, often by sail and, in the case of punts, by pole. Historically this is one of the most important classes within the category. There is an unbroken tradition from King Alfred the Great's navy yard at Southwark, building double-ended Viking type vessels, to the wherries portrayed in 18th century paintings of the Thames. 3,000 of these craft were registered on the Thames in 1826, and were in effect the taxi of the day. Sadly only one replica survives. These craft gave way in the 1880s to smaller gigs (straight stem), then skiffs (raked stem and stern) and in about 1910 to punts. Over 1,000 of such craft are to be found around the country with a concentration on the Thames.

Another group consists of the various types of racing boat, of which some 500 survive, some pre-dating the introduction of out-riggers in the 1840s. From about 1910 dinghies were popular and probably some 1,000 pre-1940 craft of this type

survive around the country. Many are adapted for sailing and they are the precursors of the modern racing dinghy. Most of these craft are privately owned, although some historically important items are owned by museums. Their on-going maintenance and restoration work is carried out at three traditional boatyards in London and at two in Oxford, but there is less money available for the conservation of unpowered craft than for powered craft.

Physical needs

The Thames Traditional Boat Society seeks to provide ideal conditions for the keeping of these boats out of the water during the winter, but land values alongside the Thames makes this difficult. Some local authorities, however, require some river-side developments to include boat-housing. Prioritisation would almost certainly identify those craft which are worthy of proper accommodation. The new Docklands Museum in East London has an ideal facility but limited space and resources for conservation.

Documentation

Records are very scattered between the Museum of London, the Guildhall Library, livery companies and private boat-builders and rowing clubs. The Thames Traditional Boat Society has records of its 500 members' craft.

Human resources

The Thames Traditional Boat Society is the main proponent for this type of craft and its 400 members own 500 vessels. As with other umbrella organisation in this category its role in supporting rallies, the exchange of expertise and the maintenance of skills is important. The traditional boat-yards provide continuity but their survival is dependent on the enthusiasm of a few, as the amount of work available is limited. The role of museums in providing work is here potentially critical. The Museum of London (shortly to lodge its collection with the Docklands Museum), the River and Rowing Museum at Henley, the Eton College collection, and the Science Museum have examples but limited space.

Public access

This is very undeveloped, though some of these craft participate in the Thames Traditional Boat Rally and the annual Thames rowing race. The Museum of Docklands opening later in 2001 is to display the Museum of London's collection of Thames craft.

Funding

Funding is almost entirely from private sources, with some involvement of museums and rowing clubs.

Prioritisation

The Society has considered prioritisation, but has not taken the matter further as to date there has been no incentive to do so. An objective scheme of prioritisation based on the SBA formula would serve not only to identify how many craft are important, but place them in order and facilitate applications for grants which would in turn help the boat-yards. It would also reveal what needs there are for further accommodation. The following are examples of craft that look to be of importance:

a ferry punt from 1880 at Oxford
four fishing punts at Sunbury
'Rose in June', a replica wherry
three watermen's skiffs in the Museum of London
a Richmond skiff of 1880
a Richmond skiff of 1888, the original of 'Three Men in a Boat'
an 18th century shallop in the NMM
an apprentice's 1789 half scale model of a wherry in the Science Museum
a 10 oared racing boat at Eton
three pre-1840 racing boats
a 6 oar Cornish pilot gig of 1810
'International' class of racing dinghy No.4 of 1920

6.11 Vintage Wooden Boat Association (East Anglian Wooden Boats)

Basic Details

This is a very diverse class, consisting of about 600 wooden boats which have in common their association with East Anglia - the rivers and broads of Norfolk and the fenland rivers of Cambridgeshire. These include motor boats, motor sailers, and sailing craft, built either for cruising or day use, and designed for the relatively shallow waters and limited river width of the region. Most were built for leisure use and companies were operating hire fleets of sailing craft before 1910, with motor boats becoming available in the 1920s. In addition to the pleasure craft many types of working boat were built for the region. Of the once numerous cargo sailing wherries two remain – ‘Albion’ and ‘Maud’ – both of which have been designated by the National Historic ships Committee. Four pleasure wherries also survive. Of the punts and reed lighters few remain and it is desirable that examples be preserved. The Vintage Wooden Boat Association which is the principle class organisation for these boats has the following break-down of types:

Table 3. Vintage Wooden Boats

	Under 20ft.	20-40 ft.	Over 40 ft.	Total
Motor	50	336	44	430
Sail	131	266	29	426
Steam	-	-	1	1
Other (oars etc)	19	5	-	24
Total	200	607	74	881

All are privately owned and are accordingly moored privately at marinas and boatyards of which many still exist. The Norfolk Heritage Fleet Trust at Ludham operates Hunters yard and a fleet of traditional Norfolk Broads sailing craft for hire. This has been supported by the HLF.

Physical needs

With over 15,000 craft of all kinds licensed on the Broads there are many mooring arrangements and boatyards even with covered storage are available for historic craft to use.

Documentation

The Vintage Wooden Boat Association has computerised details of over 800 craft of which around 400 are members. The periodicals ‘Classic Boat’ and ‘Watercraft’ provide important links and information across the whole category.

Human resources

The Vintage Wooden Boat Association performs a valuable role as a centre of information and advice and the provision of services such as insurance. Its stands at shows provide a focus of attention on the conservation of wooden boats and a stimulus to the maintaining of the relevant skills. Conservation skills exist at boatyards in Norfolk and Suffolk though many have turned to work on glass reinforced plastic and there is an International Boat Building Training College at Lowestoft. There is a fear that young people with skills will not be in adequate numbers and that the preservation of traditional wooden boats is at risk to rising costs of training, of boat repair and of meeting the costs of the Boat Safety Scheme due to hit the Broads in 2005.

Public access

The boats at Ludham are available to the public for hire. The Wherry Trust and the Albion Trust enable the public to experience wherry sailing through charter and day sailing. An annual rally of the VWBA is held on the Broads, and there are other events during the year at various locations. The Museum of the Broads at Stalham portrays the heritage of boating for work and pleasure in the region and is attempting to preserve boats of significance.

Funding

Funding has come from private sources, especially through trusts, and from HLF.

Prioritisation

There is none and there has been no motivation hitherto. That said, there are probably 30-40 boats of real historical interest.

6.12 Museums

The approach taken to describing this category risks omissions and double-counting. There are undoubtedly some craft of historical importance of which the class organisations are unaware, often when they are in museums, and it is for example possible for an 'Old Gaffer' to be in addition a Fishing Boat and a Dunkirk Little Ship. In an attempt to minimise the omissions some short paragraphs follow on museum collections.

There are a number of maritime museums or museums with maritime objects and themes, both publicly and privately owned. Some have collections of importance. Some specialise in boat types or classes, illustrating the development of design and showing contrasts with foreign craft; some have a strong regional flavour; some deal with maritime topics such as fishing and have boats on display as part of their coverage; some have a selection of smaller craft dominated by larger vessels. Some have no boats at all and concentrate on models, pictures and interpretation.

One thing most of them have in common is financial fragility; many budget for income at less than half their running costs and have to make up the shortfall by holding special events or with grants from the public sector. Some are keen to increase public benefit by operating their boats and offering short trips and charters, but the additional maintenance and skilled staff required render this activity barely profitable, a problem exacerbated by Health and Safety concerns. Some see

workshops as a visitor attraction and as a focus for preserving skills, based on the Transport Trust Heritage Skills Centre concept. Many have fine collections of highly desirable ship models for which there is a ready market, giving rise to a temptation to sell.

National Maritime Museum, Greenwich

Impressive, grand, stylish and part of the World Heritage Site, the museum's website claims that it is the largest maritime museum in the world. Through its Maritime Collections Initiative it is to be applauded for taking a leading role in seeking to bring some coordination across the whole category.

National Maritime Museum Cornwall, Falmouth

When completed later this year, this will be a pre-eminent collection of 130 boats. About 40 will be on display at any one time with some afloat. About 30 boats are sailing dinghies, six are fishing boats, five Thames boats, and about 20 are of foreign origin. No grading has yet been attempted.

Chatham Historic Dockyard

This has been a major beneficiary of HLF funding, mainly for the infrastructure. Its relevance here is primarily for its collection of RNLI-owned lifeboats.

Classic Boat Museum, Newport (Isle of Wight)

By contrast with the above is this private collection of about 40 craft, half sailing half powered, two thirds of which are owned by private individuals who lend their boats to the museum, thereby obtaining covered accommodation. All are afloat and used. Income is from admissions, storage charges and fundraising but, unlike many museums, the operation covers its costs. Most of the effort is by volunteers. Although museum status has been sought in order to qualify for grant-aid, the short-term lease of the premises and a below 50% ownership of items have so far prevented this.

No effort has been made to prioritise the collection which has several craft of undoubted historical importance such as three early lifeboats and Lord Brabazon's 'auto-gyro' rigged 'Redwing'. This is a classic case of a small privately run activity, smaller than the theoretical ideal, not complying with all museum standards but surviving due to enthusiasm, the high quality of the conservation skills, and the interest of the collection. A key attraction is that the museum offers the public the sight of craft under way as all the craft are sea-worthy. Regulations and insurance alone impede taking the public on the water.

There is a separate bus museum nearby but there are few links.

Great Yarmouth Maritime Museum

This is in transit to new premises in a former herring curing works. It is an example of a small town museum where fishing features significantly, and some boats are part of the display. It has in its small collection the last surviving Broads 'lateener', four dinghies, a shrimper and a gun punt, all with local associations. A 1930 steam drifter kept in Yarmouth, the 'Lydia Eva', is nominated by the NHSC for the 'Core Collection'.

Maritime Museum of the International Sailing Craft Association, Lowestoft

This museum has a collection of nearly 300 boats, many from the defunct Exeter Museum and 17 recently from Grimsby. Half are foreign. About 100 are considered to be of such importance historically that they should be kept onshore. The remainder will be sailed, repaired and on display. Boats owned by members of the Association will be sailable at any time.

There is an extensive but untidy archive on which an attempt to computerise the details of the collection has been started.

This museum is the subject of a consultant's study at present and has a number of problems. The present premises are inadequate for display and there is a proposal to move in 2001 to another location in Lowestoft with mooring space. On the positive side, the collection is sizeable (too big even), contains some interesting boats, is accessible, and has boats available for use.

There is also in Lowestoft a Maritime Museum of the fishing industry but it has no vessels other than a large collection of models and an archive of local fishing history.

Maritime Museum, Ramsgate

This is a small museum owned by a private trust occupying harbour buildings owned by the local authority. The dominant theme of the museum is the marine archaeology associated with the Goodwin Sands. A steam tug 'Cervia' is the largest vessel in the collection, but there are two Dunkirk Little Ships, 'Sundowner' and 'New Britannic', and a Danish-built fishing boat, 'Strandby', which used to work out of Ramsgate. These are all afloat in the harbour, and under cover ashore there is a collection of smaller craft, dinghies, and rowing boats. An application for funding is in hand for accommodation and conservation of the sole surviving ship's gun carriage and barrel, retrieved from the wreck of the 'Stirling Castle' which went down on the Goodwins in 1703.

Merseyside Maritime Museum, Liverpool

This is part of the National Museums and Galleries on Merseyside and is splendidly located in an old warehouse on the waterfront in central Liverpool. The small boats collection of about 70 widely varied craft is in store in air-conditioned seclusion as there is insufficient room in the museum. The same applies to the interesting land transport collection. A solution for both would be a new building in the dock area but this is dependent on many factors, one being Liverpool's nomination as European cultural city when it is next Britain's turn in 2008.

This museum has a tradition of conservative curatorial policies, and a grading system with an accompanying acknowledgment of graduated curatorial standards could release some interesting items for public enjoyment.

There are good library and archive facilities with no current problem of accommodation.

Newcastle Museums

The maritime collection of Tyne and Wear Museums is part of the Discovery Museum. It focuses on Tyne and Wear boats and has the following interesting vessels:

- 'Iris', a 5 m. Tyne foyboat (for berthing larger vessels)
- 'Bonny Tyne', a replica foyboat for educational purposes
- 'Elswick No. 2', a 17 m. cargo wherry.
- 'Peggy' a 6 m. Wear foyboat.
- 'Blossom', 'Fulmar', and 'Glad tidings', 10 m. fishing cobsles.

Four racing rowing boats.

The collection is being re-housed in an old warehouse in central Newcastle and in a new store at Beamish. There is also a considerable collection of ship models and a large archive of ship-building papers which are a problem to accommodate.

River and Rowing Museum, Henley

This is another hybrid museum, being focussed on both the town and its principal source of fame, rowing. The collection consists of eight rowing boats from the early 1800s to 1976, a Canadian canoe from the 1880s, a Thames skiff, the remains of a Saxon log boat dating from about 500 AD, and 'Eva', an umpire's steam launch from 1874, which is designated. It is funded privately and by corporate sponsorship, and derives most of its income from sources other than the museum itself. It has some archives in the library and progress is being made with cataloguing. An application for revenue funding to support this in preparation for the HLF.

The objectives are to develop the covered storage capacity, to grow the collection in a controlled manner, and later to develop the ability to carry on activities on the water by building a landing stage.

Scottish Maritime Museum

This is an independent charitable trust operating on three sites, Irvine, Dumbarton and Glasgow. There are 40 vessels of all sizes with only 6 above the NHSC limit. One of these the 'City of Adelaide' is under threat. 'Carola', a steam yacht, is also designated. Public boat trips have been arranged in the past but have been found to be loss-making. The trust operates its own workshops for metal and wooden repairs with four qualified people, 3 apprentices and 18 trainees. The public are able to see work being done. The trust has a small archive and has participated in the National Maritime Museum initiative to locate records where they will be most conveniently used.

Shetland Museum

This is a good example of a small local authority owned general museum which naturally contains a rich collection of boats because until the 1850s they were the only means of transport in the islands, and fishing was a principal source of subsistence. The collection of 19 boats is mainly in storage pending the construction of a new museum. All except two are below the National Historic Ships Committee cut-off. Four were not built locally but played an important part in Shetland life. One of these is a ship's lifeboat of the 1880s, another is a former ship's boat from the German Battleship 'Hindenburg', which sank at Scapa Flow. The boat survived to be used as a launch between the islands. The remainder are traditional Shetland craft which complement the collection in the north of the islands on Unst. It is the museum's policy not to sail its older boats but to preserve the integrity of their construction.

Ulster Folk and Transport Museum

This is part of the National Galleries and Museums of Northern Ireland which, in the transport area, has aviation, road, rail and maritime items. The present maritime collection, which contains boats from Ulster as well as from the rest of Ireland, is currently housed in an old gallery in the large site outside Belfast. There is a vision to develop a new gallery for marine and aviation items in part of the old ship-building

area of Belfast. Besides the boats, the maritime collection contains a large Harland & Wolf archive, many ship models, and marine mementos.

Unst Boat Haven

This is part of a heritage centre at the northernmost point in the Shetlands which, in spite of its remoteness, is able to attract some 3,500 visitors a year. In a modern building 30 metres long they have a collection of wooden non-powered boats. Most originate from about 1900 or earlier, and the policy has been to focus on the older traditional un-powered craft. Out of the 19 in the collection most are traditional Shetland double-ended clinker boats derived directly from the Viking craft. The largest, a 30ft 'sixer' with six oars and a square sail, is still sailed. Besides the local boats there is one Norwegian, one Faeroese, a folding boat from about 1900, and a Welsh coracle. This is an example of a collection where the sum is possibly even more important than the component parts.

6.13 Summary of category needs

Smaller vessels often suffer from being overshadowed by larger ones. They do, however, have strong cultural, emotional, regional and historical ties as lifeboats, military boats, fishing boats, or as the descendents of the earliest craft. The leisure associations of some motor and sailing boats appeal to yet other audiences. Steam has a strong following. Most boats are privately owned and the majority are sailable. They therefore appeal to a wide public of both observers and participants, some of whom in pursuing their enthusiasms can afford to support the traditional boat-building skills.

The variety of small boats does not make it easy to classify or generalise, but the following key needs may be concluded from the more detailed class analysis:

- a common grading system across the category is needed in order to prioritise conservation efforts. This must take into account the NHSC cut-off points;
- about 500 small craft are probably of significant heritage importance and should be preserved. There are cases where modest supporting sums can help the conservation of important craft by private enthusiasts;
- revenue cost support for maintenance and rallying could in some cases be a means of keeping craft useable and enhancing public access;
- more training in traditional skills both at colleges and as apprenticeships appears to be needed, though further investigation as to how and where is required;
- the development of combined workshop, storage and public education facilities located at a few chosen sites (especially boatyards) to enhance public access and ensure enduring public support;
- a 'sink' or store for archive material;
- safe storage where boats at risk could be placed pending restoration would keep open the options between disposal and conservation for display.

6.14 Summary Matrix

The 'historic' column in the following table is an indication (and no more) of the number of historically important smaller boats which, when subjected to a grading system, might be considered of sufficient historical importance to earn a grade. This number is probably at the low end of the range of probabilities and could be increased by closer inspection and if vessels close to or between the NHSC criteria were not included in that study. It could be reduced if duplication should prove to have been substantial.

The 'total identified' column is a refinement of a much larger quantity scattered around the country, on the water, in the mud or resting on a trailer. Whether there are in fact a much larger number of these small vessels is of no direct relevance to this report.

Table 4. Summary Matrix of Small Boats

Class	Total identified	Historic
Inland Waterways	800	90
Classic Motor	300	40
Dunkirk	147	7
Fishing	600	50
Lifeboats	500	20
Military	1664	40
Old Gaffers	1960	20
Steamboats	315	20
Thames powered	600	25
Thames un-powered	2500	50
East Anglian wooden	800	40
In museums	660	Say 100
TOTAL		Say 500

7. REVIEW OF ISSUES

The following issues of relevance across the categories emerged from our analysis:

7.1 The need for a strategic view of preservation

At present the management of grant aid to the transport heritage sector, as to others, is reactive to applications from the field. This is a traditional British approach. The need for grantmakers to take a more informed, proactive and co-ordinated approach has been highlighted by the availability of more funds as a result of the National Lottery. It would be desirable for the development of strategy to be co-ordinated so that, as all preservers, private collections and museums improve the process of setting priorities for need, available funds are directed in a co-ordinated manner.

7.2 Private ownership

A high proportion of items in all transport categories are privately owned and much of the enterprise in transport preservation is the product of the enthusiasm of private individuals. This has the obvious advantage that enthusiasts are funding conservation and accommodation and there is no direct drain on public funds. However, there are disadvantages. Curatorial standards are not normally under scrutiny. There is less likely to be provision for public access or interpretation, and there is a serious risk that in the case of death or impoverishment items owned by individuals will deteriorate, or simply disappear. There is also the risk of sale abroad, subject to the rules of the Export Review Committee.

7.3 Collections

62 non-national museums or collections have been ‘designated’ in order to give greater protection to their collections of national or international importance. Four of these cover transport: the National Tramway Museum at Crich, the London Transport Museum, the National Motor Museum at Beaulieu, and the Museum of Road Transport at Coventry.

The ‘designation’ of whole museums or collections does not conflict with the prioritisation processes taking place within the categories. Items within public museum collections, whether ‘designated’ or not, should be as much subject to grading as items in private hands. There may, however, be collections within museums or in private hands which themselves merit grading, as a collection. The British Aviation Preservation Council formula for prioritising items takes account of the value of an item as a part of a collection.

7.4 Grading

The process of registering and listing has been developed most in the case of buildings. Here records are kept by the National Monuments Record, part of English Heritage, (similar arrangements exist in Wales and Scotland) within a legal framework. The creation of registers and the process of listing are administered by English Heritage (in England) on behalf of the Department of Transport, Local Government and the Regions. The Government's motivation is primarily preservation, and it is able to enforce the law concerning repairs and alterations to listed buildings, although there have been sad cases of insufficient funds handicapping local authority attempts to prevent certain listed buildings from collapse.

In the case of transport heritage the process has been entirely voluntary and led by the private sector. It begins with the compilation of registers. All four categories discussed in this report are well advanced in this part of the work. Aviation was already well ahead at the time of the previous Transport Trust report to HLF; the others are making progress. Listing has only been tackled effectively by aviation, but this is still incomplete and only covers airframes held by organisations open to the public on a regular basis, thereby excluding virtually all private collections. The others are trying to find a way ahead which avoids too much acrimony. It is feared this might arise when it comes to setting priorities for items which are in many respects similar. It is therefore important that private owners and groups understand the possible benefits of listing, as well as the possible drawbacks, and that it is done by people acknowledged as experts. It is also important that each category and even class adopts a formula appropriate to its character.

The closer the qualifications for listing can be defined the easier it will be to be objective about grading. At present there are various methods of grading in circulation.

1. The Department of National Heritage (as it then was) in July 1997 re-defined a set of criteria for restricting the export of items of transport. These are known as the Waverley Criteria.
 - Waverley One activated if the item is 'so closely connected with our history and national life that its departure would be a misfortune';
 - Waverley Two applicable to items of outstanding aesthetic importance;
 - Waverley Three concerned with the item's significance for the study of a branch of art, learning or history.

These are too broad and attempt no grading so are unlikely to be of much assistance.

2. The National Historic Ships Committee (NHSC) uses a scale of values 1-5 for various attributes to which are applied arbitrary weightings. This has been adapted by the Steamboat Association as follows:

- | | |
|-----------------------------------|---|
| a. age; | 5 |
| b. uniqueness of type & function; | 4 |

c. socio-economic significance;	3
d. association with historical incident;	3
e. % originality of form and design;	3
f. aesthetic qualities;	2

g. % originality of fabric;	2
h. condition;	1
i. exemplary status of its function e.g. as a dredger;	1
j. exemplary status as a type and construction.	1

This has a degree of objectivity, but the values are subjective, a heavy emphasis is placed on age which some regard as of marginal importance, and the scores do not lead directly into a grading system. The application of a weighting factor to the basic score widens the gap between items but increases the subjective influence. However, practitioners find that the results obtained match general expectations fairly well. The characteristics used have a clear maritime flavour, which could be adapted.

3. The Historic Boats Working Group (HBWG) has evolved a similar mechanism for canal boats which takes account of
 - a. rarity - age, number in class, percentage of class surviving and regional significance;
 - b. authenticity - hull, cabin, interior, equipment, propulsion;
 - c. condition - hull, cabin, interior, engine equipment;
 - d. bonus multiplier for size, function, propulsion, hull material.

This is clearly specific to narrow boats.

4. The Institution of Civil Engineers Panel for Historical Engineering Works (PHEW) has done something similar but without the weighting. Its approach, which is currently being applied to canal infrastructure, involves
 - a. listing classes;
 - b. determining a list of features which contribute to historical worth such as 'rarity' and 'condition' (but not age);
 - c. determining broad qualities within each feature. For 'condition' these might be 'excellent', 'average', 'below average', 'poor';
 - d. allocating scores to each feature by first allocating letters A to D to reflect the broad qualities (A for 'excellent' etc.) and then putting numerical worth such as: AAA or AAB = GRADE 1 etc.

Without a weighting factor the results are almost certainly too coarse for individual items and are perhaps more suitable for infrastructure.

5. Similarly UNESCO has a set of general criteria for World Heritage Site status which has been developed with industrial sites specifically in mind. The purpose of this set of criteria is to include or not – graduating worth is not required. The criteria are as follows:
 - a. that it should be a work of engineering genius;

- way;
railway;
- b. that it should use innovative technology or be pioneering in some way;
 - c. that it should be an outstanding or typical example of a type of railway;
 - d. that it should illustrate or enhance significant social or economic developments.

These criteria apply only to infrastructure and a weakness of the World Heritage status as applied to railways is that whereas it places a burden on the host state to preserve the site 'for ever' (subject to certain conditions), it makes no stipulations about the locomotives and rolling stock.

6. On the other hand, the Railway Heritage Committee criteria apply specifically to artefacts, but again no graduation is required, as the purpose is to identify as being worthy of preservation or not. They use the following stipulations:

- a. that they are unique, as made or built/ the last remaining example of a group
 - or class/extremely rare;
- b. that they are representative of a group or class that merits preservation;
- c. that they are illustrative of a type of activity which merits preservation;
- d. that they represent an important technical or operational aspect of the railway;
- e. that they represent an important aspect of the social impact of the railway
- f. that they form part of an established series or part of an assemblage that is
 - being collected by a recognised institution;
- g. that they represent an important stage in development;
- h. that they have been involved in some significant event or have associations
 - with an important person or organisation;
- i. that they are of local, regional, national or international importance.

Designation by the Committee requires that the last and any one other condition be fulfilled.

7. For its own internal use, the National Railway Museum has developed four levels of importance for items within the National Collection. They are understandably museum-oriented:

- 1
 - 1.1 'icon', at risk from operation or poor environment;
 - 1.2 nationally significant, not to be restored or operated;
 - 1.3 nationally significant but could be operated;
- 2 important link in history of railways, kept under cover,
loanable;

- 3 enhances story of railways, can be restored, loaned or operated;
- 4 interesting but not unique, can be restored, operated or loaned
- 5 not worthy of retention.

8. The most advanced and widely used system is that of the National Aviation Heritage Register. It covers airframes only and at present does not include civil airliners. Infrastructure has not yet been tackled. It has three grades:

national benchmark	7 or more points
significant	4-6 points
noteworthy	Up to 4 points

One point can be awarded for each of the following criteria:

- a. world significance;
- b. national significance;
- c. operational or technical significance
- d. social significance;
- e. survival status (rarity);
- f. condition (originality or authenticity);
- g. part of a museum collection (2 points);
- h. environment (airworthy or kept under cover) (2 points);
- i. local significance (2 points).

The values are arbitrary but they have the merit of transparency. Three gradings are automatically produced and, since the response to six of the characteristics is 'yes' or 'no', subjective influences are minimised. It has the special merit of being applicable to all categories.

Given the variety of characteristics within and between categories of transport, the development of grading is likely to be most productively pursued by each category adopting whichever system suits it best. Having achieved a level of evaluation or grading within each of the categories, it will then be desirable to impose a standard nomenclature (such as Grade 1, 2 and 3). This will have the advantage of strengthening the case for transport preservation in general and in relation to other heritage sectors. It will also make possible a comparison between categories. That is not to suggest that it will ever be possible or desirable to compare, say, the importance of HMS Belfast with that of a 1912 Leyland bus, but if both were Grade 1 within their categories, their importance would be better understood than if one were known to be on a 'core list' and the other was said to have a score of 119.

7.5 Restoration

There is some debate as to the state to which an item should be restored. There are many railway engines which were altered during their working lives, sometimes significantly, and it can be hard to decide to which of many versions a restoration should be made. To revert to the first manifestation is not necessarily the only authentic solution in all cases: an interim stage may be entirely appropriate. Rebuilt

Merchant Navy Class locomotives are a case in point. The issue becomes more complex with canal boats, where many adaptations were made over what was often a long life. John Scoles, one time Curator of the BTC collection when it was at Clapham, put forward the view that the restoration of transport items should be to that state in which the item made its greatest contribution.

The question is more difficult where it is intended to recreate an authentic historical item by altering a similar but different item. For instance, the Great Western Society at Didcot is converting a Great Western Railway locomotive from one class of which there are several surviving examples to a class of which none survives but which was of much greater historical significance. Provided the item to be altered is not listed and the item to be created would qualify for listing on grounds of interest, historical importance, or other relevant criteria, it is felt that such a process may warrant consideration for grant aid. This is a parallel argument to that put forward for grant-aiding replicas.

7.6 Replicas

The role of the replica is another thorny issue, as is its definition. In the context of transport it generally means a close imitation of the original with no original components and with identical or similar but modernised machinery. If it is to be operated, it would normally comply with current Health and Safety requirements. In the aviation category there are special meanings which are listed in the Glossary.

It can often be hard to distinguish yachts built from the original drawings whether in 1900 or 1924, or even 1999. Indeed transport replicas made with materials as originally specified in accordance with detailed original drawings are hardly distinguishable from universally acknowledged originals, which would have been subjected during their lives to overhaul and replacement of parts. Many genuine restorations in all categories rely on parts retrieved from other sources or newly constructed from original examples.

Enthusiasts have gone to great lengths to avoid a total reconstruction being condemned as a replica; a Spitfire's number plate could fetch astronomical value if it could form the heart of a 'genuine' restoration. Certain boats have been restored around the most minor original component in order to be judged original for the purpose of gaining reduced registration fees. Such a reconstruction using a small fraction of the original materials may technically be judged not to be a replica, but it differs little from a totally new construction.

Since there is so little difference between a heavily restored original and a replica, it may be queried why replicas have been so lowly regarded. It may be by analogy with reproduction furniture, sometimes made deliberately to deceive. It may be because replicas of the older originals pre-dating accurate drawings and material specifications have had a spurious superficial perfection. Perhaps it is partly due to positive admiration for the restorer who hunts down the components he needs in old sheds, in fields and tidal creeks all over the country.

In the case of transport, where we have lost examples of the original, a replica can perform a valuable educational role, especially if it can be operated. Furthermore, as originals become increasingly worn, there will be a time when they need to be

replaced by replicas in order that the public may continue to experience earlier transport. This has already happened in the case of boats and aircraft and a London horse bus.

7.7 Operation

The operational use of historically important items is a topic for endless debate. In the case of both aircraft and ships there is the risk of loss. But in all categories operation causes inevitable deterioration, although even static display causes slow wear of original materials. The carpet of a grounded airliner may be worn out more slowly than the boiler of a steam engine but, eventually, if the public are to be offered access, the process will unavoidably occur. Even items kept out of human reach in protected environments will deteriorate over time.

On the other hand, there is strong evidence that the public will travel far to enjoy riding on railways or to see an air show or an old vehicle rally. They appear to be less motivated by static exhibits in a museum. Some 9million passengers a year travel on steam railways and over 6million attend flying displays. Admittedly visitor numbers at the largely static National Railway Museum are high (nearly 500,000), but observers of the annual Veteran Car Run from London to Brighton far outnumber visitors to the National Motor Museum in a year. A weekend flying display at Duxford draws over a quarter of the RAF Museum's annual visitors.

Since transport is fundamentally about movement and its interpretation, and since the perpetuation of the skills associated with its operation are dependent on its being used for its original purpose, there should be a presumption that it will be used. The burden of proof should lie with those who wish to conserve. Their case may be justified by age, fragility, danger, or the extreme technological importance of a particular piece of equipment or machinery, but only the most important items should qualify for this restriction on use.

Since operated transport is so much more appealing to the public, there would seem to be a case for revenue cost support in compensation for the deterioration caused. Preserved railways have been criticised for sacrificing historical accuracy to profit, although some companies already operate period trains on certain occasions and goods trains for photographers. The operation of a facility like an aviation control tower, a railway signaling education system, a vintage train, a hovercraft, ancient buses, or a canal lift, should arguably be supported if operated for educational and general interest. Similarly it may be desirable to afford revenue cost reductions for the operation of listed items such as boats when specifically for public benefit. These could follow practice in France and take the form of fuel tax rebates.

Because operation attracts regulation, one of the penalties paid is the need to adapt transport to satisfy health and safety standards quite different from those in force when the item was first built. The preserved railways have managed to avoid having to alter historic carriages for wheel-chair access and, in the marine world, the Common European Maritime Heritage Congress is trying to secure appropriate regulations for safety on board what are termed 'traditional ships'. Enhanced capabilities are required of steam engines to be operated over the modern commercial main line railway and the aviation world is beset with regulations. This is a delicate area but it is evident that watchful umbrella organisations can moderate the worst excesses of bureaucracy. In this context replicas play a useful role.

7.8 Foreign items

The preservation and display of articles that originated abroad is an important part of the practice of British museums and art galleries. The Elgin marbles in the British Museum and every foreign painting in the National Gallery are powerful examples of the application of this practice. British engineering and science has been as much influenced by overseas discoveries as it has in turn influenced foreigners. Foreign built or designed items which have played an important part in the development of our culture and manufacture should qualifying for listing and any consequent benefits. It is most likely to arise in the case of aviation, particularly with American Second World War aircraft and more recently airliners. The American Air Museum at

Duxford, the Oporto tram at the National Tramways Museum, and the wagons-lits carriage on the Nene Valley Railway have set precedents.

It is also worth considering the preservation of items built in Britain and then exported. The export of steam engines to India mainly from Manchester and Glasgow was an important part of British 19th century economic and industrial activity. Conversely, transport collections in the UK often contain foreign built and operated items, such as early electric locomotives or marine outboard engines, which also need preserving.

7.9 Commercialism versus heritage

It is difficult to be clear about where the line should be drawn between what is commercial and what can be classed as educational. The difficulty is found both in an operational context and in the case of restoration. It arises particularly in the case of railways. Examples might be an express locomotive employed on rail charters by a charter operator, sailing barges owned by companies for commercial charter or their own hospitality, or vintage buses leased to a local bus operator. We would argue that provided the profits to the owners of the item are ring-fenced and devoted to the item in question or to conservation work generally, the item should not be disqualified for grant aid. By extension, if a railway infrastructure is restored to a genuinely original state with traditional methods of operating, and inevitably a high proportion of volunteer labour, it is hard to see why it should not take an economic rent from a train operator using modern rolling stock for profit, without being barred from grant aid for infrastructure work. This would have to be subject to the proviso that such income were ploughed back in to the company and not distributed. Commercial freight trains over the West Somerset are an example.

It is more difficult to determine whether a preserved railway operation is truly a heritage activity and therefore worthy of grant, or whether it is more a commercial railway operation, run by enthusiasts, of no historical or heritage-preserving value, yet valuable for its public access opportunities. Most cases are not black and white, and offer a mixture of money-making and heritage preservation. Indeed, the requirement of financial viability encourages such commercialism. Grading for heritage value may help judgments about funding in this area.

Cases are now beginning to be seen which go one step further. Some railway projects are beginning to acquire a hybrid character, using former railway track-bed like a heritage railway, but being run as a public service. An example of this is the projected Norfolk Orbital Railway linking the North Norfolk, a heritage railway, with the Mid-Norfolk, by way of Fakenham. A similar case also in Norfolk is presented by the possibility of the North Norfolk taking over the commercial railway operation between Sheringham and Cromer. It is suggested that the test of a heritage railway is that it is run for its own sake and with the objective of reliving the activity of an earlier age; others, however fragile the economics, are not heritage railways if they seek to provide a public service or remunerate capital, or just provide amusement to the owners.

7.10 Secure accommodation

As has been recognised already, there is no point in preserving and restoring transport if it is then left to deteriorate or be vandalised. Not all transport items require covered

storage, but all within the categories covered by this study would benefit from being accommodated in a secure location where maintenance facilities are available under cover and where the public may witness and enjoy a range of items. Such collections can be vulnerable to financial pressures as was seen in the case of Transperience at Bradford and more recently the fishing boat collection at Grimsby. The viability of regional collections with their obvious local appeal and ease of access has to be weighed against the risks of proliferation.

7.11 Ongoing maintenance

One of the main restraints on collections is the cost of maintenance associated with any item of transport, whether or not it is operated. This may be exacerbated by the curatorial standards set in the museum world. It is suggested that a system of grading could enable varying standards of curatorial care and maintenance without prejudicing the survival and enjoyment of items.

7.12 Archives

This important part of transport heritage tends to be overlooked until it is too late. The public is generally not aware of the need to preserve until there is already a high probability that the evidence they seek is lost for good. Amongst transport preservationists an interest in archives tends not to be such a driving force as an enthusiasm for vehicles. Archives are of interest more to the historian and the researcher. They tend to become available for public keeping either randomly or more occasionally by deliberate planning. Although the market functions quite well in the case of the more immediately attractive records like photographs, posters and books, there is no substitute for the public archive for most items of historical importance. The only statutory organ focused on the transport sector is the Railway Heritage Committee, which has the power to select items for preservation, but this covers only the companies involved under the Railways Act. It excludes most preserved lines and, of course, all other categories of transport. It can do nothing about items already acquired by individuals. The problems within each category are tackled above, but there are certain aspects which could be attended to centrally.

County Record Offices, and certain museums and other organisations receive photographs and printed records by bequest or gift. The Transport Trust Library at Ironbridge is one of these, as are the National Railway Museum and the Omnibus Society, whose collection is also at Ironbridge. A small independent group in Worthing is endeavouring to save transport photographs of all kinds from the dustbin. The Public Record Office has a large and well catalogued collection of earlier railway and canal records, both public and private. Other items are scattered throughout the land in museums, record offices, private company filing systems, and above all in private houses.

There is a danger that items are being irretrievably lost because the cost of the correct conservationist procedures prevents their being properly accommodated, let alone catalogued. It seems that the first priority is a location which becomes known as a store of last resort for transport records of all kinds, where the conditions are adequate to prevent short term deterioration but where the cataloguing and sifting of items could be regarded as a long-term job for volunteers under professional management. Meanwhile, a coarse filing could be carried out by transport category, and company, leaving researchers to delve and search for detail. If located centrally for all categories

this would become well known and would serve as a sort of 'paper-fed Wroughton'. Cost remains a barrier but there is a real danger that, while seeking the perfect solution, much new material is being lost for ever.

Once in an archive, storage and retrieval can be much assisted by the use of information technology but, considering the relatively small number of people engaged in transport research and the admirable challenge presented by having to cope with ill-assorted paper records, it is questionable whether public investment in such measures can rank high enough. The Inland Waterways are looking at centralised access to diversified libraries, for which there are many advantages, but limited funds may be better spent on some of the artefacts and infrastructure.

In any case the current approach to archive access improvement is piecemeal. Failure to have a planned approach to funding the management of archive material will lead to more examples like the case of a website currently under preparation in Leicester, Bristol and Manchester. This, for want of co-ordinated planning, but to achieve some economies of scale, is grouping the digital archiving of records in three geographically and functionally separate units, one aviation, one railway, and one canal boats. A planned and co-ordinated approach to transport archive problems might achieve both economies of scale and a more readily useable service.

Because this is not a popular subject capable of stirring enthusiasts, there is a need for effective and strongly led co-operation between the public and private sectors.

7.13 Sustainability

This is dealt with in detail within each category. All transport has in common a wide appeal to audiences of all ages, especially when it is possible to experience live action, whether driving a bus, sailing in a boat or watching a flying display. Generally the wealthier prefer private cars and boats while public transport appeals strongest to middle-aged lower middle class men. As has been stated above there is a tendency for the public to seek action and participation rather than passive observation of static objects. There is no reason to expect interest to decline, but the desire for action and movement may hasten the decline of the smaller static display. This may even be accelerated by free admission to national museums. Already some museums are under financial threat due to declining numbers of visitors and are having to boost income by holding rallies and other special events. Even the National Motor Museum depends on its non-museum activities to survive, so the future of small static provincial transport museums must be in question. Over the next 10 years it is likely there will be some concentration of collections, activities, workshop and training facilities. Grant-aid for the revenue costs of collections will be required to avoid another Transperience or Grimsby situation. In spite of this rather gloomy situation, it is to be hoped that there will still be a place for the smaller imaginative enthusiast-driven venue where traditional skills are preserved, and where there are opportunities for public participation.

A recent report commissioned by HLF, *Developing New Audiences for the Heritage*, has investigated the sectors of the public which are less inclined to visit transport and maritime museums. Its value may be limited as it only considers museums and only four of them. It does, however, suggest that in line with experience at industrial museums there are important groups in society which do not visit transport museums. These are broadly the most wealthy, women, the young, and ethnic minorities. These findings are not surprising and to learn more about motivation it would be valuable to

compare visitor composition at different types of transport activity, including those which have made endeavours deliberately to appeal to those not normally interested.

What may also be uncertain is the continued availability of young enthusiasts to sustain the expertise needed to restore, preserve and operate transport heritage. The decline in numbers of people employed in aircraft manufacture, the change in the nature of work in car factories, the decline of ship-building and ship-owning will reduce the number of trained hands and knowledgeable heads. The Transport Trust is already making efforts to address this need at Heritage Skills Centres and by promoting an award scheme for the Young Preservationist of the Year. Others, particularly some of the railways, are also actively engaged in stimulating interest and involvement. The role of such commercial activities as Thomas the Tank-Engine should not be overlooked because, at the price of possible ridicule, they have a major recruiting influence on the young. The large number of younger people, both male and female, involved in transport preservation today, who never knew a steam engine or experienced an air-raid, suggests that there is something about transport that has a wide and lasting appeal.

7.14 Co-ordination within categories

It has become clear that, although this study has been commissioned by HLF, it touches on issues of interest to other funding bodies. Particularly in relation to the question of grading items, there is a need within each category for the opinions on prioritisation of both the private sector and the public and national museums to be jointly reflected in a single united viewpoint. Indeed it would be desirable to include items in museum collections within any grading system which might be developed.

There is perception of a gulf between the public and private sectors, and grading could serve as a catalyst for bringing about a greater degree of co-operation. The National Maritime Museum has identified the need for such a mechanism in the marine world and its Maritime Collections Initiative (UKMCI) has already achieved results. The Waterways Trust has started tentative moves in this direction for inland waterways vessels. The existence of class associations for boats, the National Maritime Museum and the National Historic Ships Committee could facilitate the process in both the large and small maritime categories. The British Aviation Preservation Council is well placed to carry out the function with the Science Museum and other major museums in the aviation category. For the railways the Heritage Railways Association is an obvious focus, but its role as a trade association may be incompatible with the task. The National Railway Museum already plays an active part in cooperating with the private sector, so it and the Transport Trust may be a more comfortable focus point. For buses, the National Association of Road Transport Museums, the British Bus Preservation Group, the Science Museum and the London Transport Museum could together cover the field, but would need strong leadership. As an independent agency the Transport Trust is available as facilitator across the board.

7.15 Conservation or servicing the public

The traditional role of the museum as a collector of interesting objects is under challenge. The Government and its agencies are looking for more obvious and broadly spread public benefits. The public sector museums are being encouraged in the direction of visitor attractions and educational resources, while on the contrary most traditional curators and most private enthusiasts are driven by their desire to preserve. There is an obvious conflict here but, in order to attract funding from public sources, both private and public sector preservationists will need to demonstrate a service to the public associated with grant aid for preservation. Some transport categories will find it easier than others to make satisfactory compromises: railways already provide much visitor appeal, air shows likewise. Buses and boats will find it more difficult unless opportunities are found for public participation in operation by means of sailing in boats and driving and riding in buses.

8 CONCLUSIONS

The disparate character of the four categories belies the similarity of their needs. The following conclusions can be said to reflect the needs of all four categories.

1. Prioritisation across the categories should be actively encouraged, and its coordination funded. It will however have to be led. At this stage in the development of grading and listing the categories should apply whatever prioritising system seems most appropriate. Grading within categories and classes is the first priority. This should lead to improved co-operation between the private and public sectors of preservation.
2. All four categories would benefit from investment in the enabling of individually owned items to be assembled in secure storage, with workshop facilities, and enhanced public viewing facilities.
3. In all cases small grants to help enthusiastic private restorers would be likely to have a low cost/ high benefit ratio.
4. Since transport is appreciated most when used and this leads to unique historical relics becoming worn by use, the role of the replica will become more important.
5. A common archive 'of last resort' should be encouraged with an emphasis in the first instance on physical storage rather than IT.
6. Consistent support of training and apprenticeships in traditional skills will be increasingly required. The skills need not all be narrowly based; for example railway carriages, bus bodies and boats have much in common, as do their internal combustion engines. This may best be aided by the stimulation of demand.
7. The more fragmented the category the more difficult but more important is the role of the umbrella organisation. Such organisations are critically important for the implementation of the measures recommended in this report.

APPENDIX 1 - THE STUDY BRIEF

Background

Since 1995 the Heritage Lottery Fund (HLF) has awarded over £112million in grants to projects in the Industrial, Maritime and Transport sectors, a very significant proportion of which has gone towards projects relating to transport heritage items and infrastructure. This represents 8% of HLF's grants to date. HLF's Strategic Plan (1999-2002) states that the Fund intends to allocate 9% of its resources over that period to industrial, maritime and transport heritage projects.

It has been clear, however, that the needs of the sector are not fully understood. A project to improve general knowledge of certain under-researched areas of the transport sector would be useful not only in general terms, but it would also help HLF in its grant-making.

HLF has chosen the Transport Trust to undertake this research on the basis that

- it is the only body representative of transport preservation which is capable of cross-sector representation;
- it can draw upon a body of expert knowledge and practical experience from all fields of the transport preservation scene;
- it is free of bias and self-interest as regards any aspect of the transport heritage;
- it is backed by the services of committed volunteers.

The project

At its simplest the aim of the project is to produce a report which will

- improve the understanding of the needs of those areas of the transport sector where knowledge of what survives and what needs to be done is weakest;
- act as a reference work for HLF grants officers in their assessment of those projects relating to areas of the transport sector covered by the study;

The study will focus on those transport categories where knowledge of needs is weakest and where HLF is most likely to make grants in the years to come. In effect this means categories where a substantial proportion of the important surviving transport items are owned by public or not-for-profit organisations. (Such organisations include those institutions and organisations funded by central government, local authorities, training and educational institutions, charities, friendly societies, and voluntary associations.) The study will, however, consider the needs of transport heritage in private and commercial ownership.

The following areas or sub-categories will be examined:

- civil aviation;
- ships below 40 tons;
- coaches and buses;
- railways.

The project should in those areas listed above

- assess the scale and focus of needs;
- detail the particular key conservation, storage and collections needs and prioritise them;
- begin in conjunction with the leading bodies for those areas the process of prioritising items or types in terms of national (and regional) importance;
- identify skills needs and shortages to carry out the work identified;
- assess the needs and opportunities in terms of public access (in both physical and intellectual terms);
- consider the sustainability of the transport heritage sector in terms of aging volunteers.

The project should also identify briefly those areas relating to the transport heritage (such as associated infrastructure or archives) about which little is known or where needs are substantial.

Heritage Lottery Fund
July 2000

Report Template

1. Basic details: Definition of category
Size of category
Description of ownership
Description and extent of associated infrastructure
2. Physical needs: Storage of transport items
Conservation/restoration of transport items
Condition of associated infrastructure (brief overview)
3. Documentation Documentation of items and collections
Existence and condition of archives
Extent and quality of research to date
4. Human resources Conservation skills - availability and training requirements
Management skills - existence and training requirements
Paid/volunteer work-force (including long-term sustainability)
Support from transport and heritage umbrella organisations
Effectiveness of advocacy and publicity
Role of museums, companies, trusts, individuals
5. Public Access Public access opportunities and potential
Education opportunities and potential
Role of ICT
6. Funding Existing funding sources, scale and focus of funding
7. Prioritisation Existence and validity of existing prioritisation
Prioritisation of needs
Initial prioritisation of sub-categories and individual vehicles

APPENDIX 2 – SOURCES OF INFORMATION

General

Geoffrey Claydon, Vice President, National Tramway Museum
Neville Mackay, Chief Executive, Resource
David Morgan, Chairman Heritage Afloat and Heritage Railway Association
Sam Mullins, Curator, London Transport Museum, Chairman Association of Independent Museums
Andrew Scott, National Railway Museum

Aviation

John Bagley, former keeper National Aeronautical Collection, Science Museum
John Berkeley, Vice Chairman, British Aviation Preservation Council
Chris Parker, Popular Flying Association
Dick Roberts, Secretary, Air Display Association Europe
Cdr. Dennis White CB, former Director, Fleet Air Arm Museum

Literature

UK and Ireland Civil Aircraft Registers, 1999 ed. compiled by Barrie Womersley published by Air Britain (Historians) Ltd
Wrecks & Relics, 17th ed. April 2000, compiled by Ken Ellis, pub. Midland Publishing
National Aviation Preservation Register, First ed. may 1998 compiled by Ken Ellis and others. Pub. privately BAPC

Buses

Nigel Adams, General Secretary, British Bus Preservation Group
John Bedford, Secretary, London Bus Preservation Trust
Colin Billington, Chairman, West Country Historic Omnibus & Transport Trust
Tim Stubbs, Records Sec. National Association of Road Transport Museums
Mike Sutcliffe, Leyland Society
Dennis Talbot, Chairman, National Association of Road Transport Museums
Ian Wiggett, Chairman, Aycliffe & District Bus Preservation Society

Railways

Aberystwyth Cliff
Bluebell
Bodmin & Wenford
Bowes
Buckinghamshire
Didcot
East Lancashire
Ffestiniog
Great Central
Kent & East Sussex
Keighley & Worth Valley
Leighton Buzzard
North Norfolk
North York Moors
Paignton & Dartmouth

Ravenglass & Eskdale
South Devon
South Tyndale
Swanage
Talylyn
Tanfield
Vale of Rheidol
West Somerset

Great Western Preservation Society
Heritage Railway Association
Merchant Navy Locomotive Preservation Society
National Railway Museum
Terrier Trust
Vintage Carriages Trust

Maritime

John Bailey, Vintage Wooden Boat Association
Jonathan Bell, Ulster Folk and Transport Museum
Richard Booth, Historic Narrow Boat Owners Club
Colin Buttifant, Boatbuilder, Norfolk
David Cade, Chairman, Old Gaffers Association
Charles Cave, Commodore, Association of Dunkirk Little Ships
Henry Cleary, Clyde Steamer & Small Boat Register
Tony Conder, Curator, the Waterways Trust
Peter Cowling, National Maritime Museum, Cornwall
Michael Dennett, Boatbuilder, Chertsey
Tony Denton, Lifeboat Enthusiasts' Society
Richard Doughty, Deputy Director Community Services, Grimsby
Richard Drake, Chairman, Inland Waterways Association
Mark Edwards, Thames Traditional Boat Society
Mr Elliott, International Boat Building College, Lowestoft
Chris Elmers, Museum of Docklands
Andrew Fox, Scottish Museum of Fishing, Anstruther
Stuart Gillies, Grimsby Museum
Julie Graham, National Motor Boat Museum, Basildon
Nick Hall, Historic Power Boat Trust
Roger Hanbury, Chief Executive, the Waterways Trust
Peter Hansford, Maritime Museum, Lowestoft
Bruce Harding, British Waterways, Watford
Richard Harvard, Steamboat Association
Peter Hollins, Chairman, Steamboat Association and the Maritime Workshop, Gosport
Tim Hollins, Steamboat Association
Michael Hunt, Maritime Museum, Ramsgate
Neil Hunt, International Sailing Craft Association, Lowestoft
Keith Jarrett, Chairman, Classic Motor Boat Association
David Knight, Archivist, Association of Dunkirk Little Ships
Kim Lyall, The Boat Museum, Newport (Isle of Wight)
Alison Marsh, Chatham Historic Dockyard
David Matthews, Windermere Steamboat Museum

John Millard, Tyne and Wear Museums
Steve Mills, Boatbuilder, Trent
Lisa Morgan, Norfolk Heritage Fleet Trust, Ludham
Geoff Newton, the Steamboat Register
Tim Parr, Consultant
Charles Payton, Consultant
Jo Quinton-Tulloch, National Maritime Museum, Cornwall
Brian Reed, Norfolk Heritage Fleet Trust, Ludham
Stephen Riley, Operations Director, National Maritime Museum
John Robinson, Heritage Afloat
Ann Sanders, Vintage Wooden Boat Association
Duncan Sandison, Unst Boat Haven
Rob Shoreland-Ball, Consultant
Philip Simons, Historic Power Boat Trust
Mike Smylie, 40+ Fishing Boat Association
James Steward, Great Yarmouth Museum
Ian Tate, Shetland Museum
Jim Tildesley, Scottish Maritime Museum
Stuart Wilkinson, Chairman, Thames Traditional Boat Rally