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INTRODUCTION

Our Vision is to be the premier airport management and services company. We want to run the best airports: where we guarantee that every moment of interaction with our airports is either a seamless experience or, even better, a pleasure for our airline customers, service partners and passengers.

We are passionate about helping to make the North West a better region in which to live, work and do business. We want to help make the Manchester city region one of the most dynamic and prosperous in the UK.

This Vision is further explained in our Sustainable Development Plan (SDP). The Plan sets out how we see our business developing; outlines our approach to important issues such as sustainable development, environmental impact and our economic and social effect on local communities and the wider North West. We are committed to the sustainable growth of our business. Our aim is to maximise the economic and social benefits that we bring while minimising the environmental and social harm caused by our activities. The Plan is supported by four detailed Action Plans that cover:

- Economy & Surface Access;
- Environment;
- Land Use;
- Community.

Our Environment Plan is intended to:

- Set a clear framework to guide the environmental policy and management of the airport;
- Identify the key environmental issues that will influence the growth and development of the airport;
- Set short term targets and medium and long term goals that will form part of the environmental programme.

The SDP comprises four detailed plans that cover the economic context and surface access, the land use implications of growth and how we intend to develop our environmental and community programmes:

Once the plan is finalised, we will keep it under review so that it remains relevant and reflects the evolution and the development of the airport. This follows the guidance in the 2013 Aviation Policy Framework. The review will be undertaken every five years.

It is also our intention to continue to openly report on our environmental performance on an annual basis and publish the details on our website.
Manchester is the largest airport outside London and bigger than many European capital city airports. In 2014, over 22 million passengers travelled on over 170,000 aircraft movements to over 200 destinations worldwide. The airport has three passenger terminals and two runways. The airport serves a wide catchment area across Northern Britain, although the majority of passengers are from the North West Region.

The World Freight Terminal handled almost 100,000 tonnes of cargo in 2014, most of which was carried in the holds of passenger aircraft. An aircraft maintenance area, hotels, office accommodation and other ancillary buildings also make up the airport infrastructure. In total, 310 companies are based at the airport, employing over 20,000 staff.

Increasingly, the airport is becoming an integrated transport hub with easy access between air, heavy and light rail, bus and coach services for passengers, staff and other people passing through the site. The opening of the £60 million purpose-built Station in 2003 has provided us with high quality facilities, and forms a vital part of our long term Economy and Surface Access Plan.
MANCHESTER AIRPORT IN THE FUTURE

The framework that will guide the physical development of the airport up to circa 45 million passengers per year is set out in our Land Use Plan. The Land Use Plan updates much of the material that we published in the 2007 ‘Manchester Airport Master Plan to 2030’. Recent forecast revisions by both the Department for Transport and the Airports Commission1 are suggesting that the level of throughput that we planned for in the last Master Plan remains a long-term throughput figure that Manchester can achieve. Hence, the work that we did to support the preparation of recent statutory planning documents, based upon the 2007 Master Plan remains fundamentally valid.

We have updated and reviewed our plans to ensure we are still capable of accommodating the forecast throughput. The main principle is one of land use efficiency and technological improvement. Limits have been placed on the physical spread of the airport site. Our plan is for redevelopment of land within the existing boundary as far as possible and non-core activities moved to the site periphery, or off-site altogether.

SUSTAINABLE GROWTH

Growth brings challenges as well as opportunities. Our commitment to sustaining the growth of our business and controlling environmental impact is clear and unequivocal.

We have a track record of developing environmental policies and taking action to lessen our impact. We aim to be one of the leading airports in Europe in the way in which we tackle environmental issues. Our first Environment Plan was produced in 1996.

Our starting point for future controls has been to assume that our impacts cannot increase in line with airport growth. Wherever possible we will strive to reduce, in real terms the scale and nature of our impacts.

We recognise that there is a cost in delivering some of the environmental controls outlined within this Plan. For example, we already pay a premium for renewable energy.

We know that as we move forward, advances in technology and operating procedures will greatly assist in delivering our objectives. However, timing remains uncertain. Within the Environment Plan we have therefore identified short-term targets (3 years), medium and long term goals.

1 Airports Commission – an independent Commission advising Government on options for long term airport capacity.
INTRODUCTION

The environmental impacts of the airport’s development and operation are many and varied. They arise from:

- Development and operation of the airport itself;
- Aircraft movements and maintenance;
- Aircraft support services such as catering, fuelling and cleaning;
- Fleet vehicle operations and maintenance;
- Cargo handling;
- Terminal operations including retail, catering and cleaning;
- Building management such as heating, lighting and toilets within the terminals, offices and hangars;
- Estate management such as anti-icing and grounds maintenance on the airfield, roads and car parks;
- Passenger and staff travel to and from the airport.

Some of the impacts are directly caused by our own activities, but the majority are caused by the operations of the large number of service partner companies on our site. As the airport operator, however, we are taking responsibility for the total impact of the site. We will work with all the companies on the site and influence them to control their impacts so that, as an airport, we can achieve the targets within this Environment Plan.

We will integrate environmental management into our business processes to ensure that the best environmental practice is carried out."
However, setting these targets is meaningless without a mechanism to deliver change and control impact. This is the reason the airport has adopted the best practice approach to managing the environment promoted by the international environmental management standard ISO14001.

ENVIRONMENT POLICY

We are committed to continually improving our environmental performance, preventing pollution and complying with all requirements that apply to us. To achieve this we:

- Continually assess the effect our activities have on the environment and regularly review our objectives, targets and programmes relating to any significant environmental aspects. Meet all legal and other environmental requirements and public commitments we agree to.
- Publish details of our environmental performance each year.
- Provide information and training to make sure that all employees, service providers and contractors know their responsibility to keep to this policy and act in line with our Environmental Management System.
- Do everything reasonably possible to prevent pollution.
- Periodically review our procedures for keeping the potential environmental risks of our activities, and of any unusual or emergency situations, to a minimum.

The airport’s environmental management system seeks to give effect to these policy aims. It documents all of the significant environmental aspects that arise from the operation of the airport and, in order to maintain certification to the ISO14001 standard, we are required, through 6-monthly independent audits, to demonstrate continuous improvement in environmental performance. The general framework for managing the environment required by the ISO14001 standard is shown below.

Figure 1: Climate change Environmental management system model for the ISO 14001 international standard
KEY PERFORMANCE INDICATORS
We have identified a number of key areas for attention and key performance indicators that are measureable, sensitive enough to allow changes to be monitored objectively and easily understood.

In line with the policy of openly and honestly reporting, the performance against all of these indicators will continue to be presented annually within the M.A.G Corporate Social Responsibility Report².

NOISE
Key performance Indicator: We will limit and reduce where possible the number of people affected by noise as a result of the airport’s operation and development and ensure that aircraft noise does not go above the levels recorded during 2001/2002 (the year the second runway opened).

Whilst actual noise levels can be recorded, their potential to be intrusive and cause disturbance cannot easily be quantified. However the equivalent continuous sound level (LAeq) is the most common index of aircraft noise exposure. It is a measure of the equivalent continuous sound level, in this case averaged over an 8 hour night from 23:00 to 07:00 or a 16 hour day (07:00- 23:00). This is used to create a contour area within which a certain sound level is exceeded. When laid over a map of the area surrounding the airport, we can measure the area and the population affected.

CLIMATE CHANGE
Key Performance Indicator: We will continue to reduce greenhouse gas emissions by increasing efficiency and obtaining energy from renewable sources.

Building upon our work to date, our priority over the course of this Plan will be to drive further efficiency improvements by continuously reducing our energy demand. We believe that generating and purchasing renewable electricity can make an important contribution to reducing our CO₂ emissions.

LOCAL AIR QUALITY
Key Performance Indicator: We will minimise the area of the 40μgm⁻³ NO₂ contour for airport emission sources.

Air pollution can pose a risk to human health and National Air Quality Standards have been set for a range of pollutants including nitrogen dioxide (40μgm⁻³). We continually monitor NO₂ concentrations around the airport site and these are modelled to create a contour area within which the 40μgm⁻³ level is exceeded. Sources of NO₂ include aircraft operations whilst on the ground, operational vehicles and energy generation.

² http://www.magworld.co.uk/magweb.nsf/Content/CSRHome
ENVIRONMENTAL MANAGEMENT

WASTE

Key Performance Indicator: Send no waste to landfill after 2018 (excluding International Catering Waste, where no other options are available).

We will manage our waste along the principles of the waste hierarchy (Reduce waste generation, Re-use, Recycle, Recovery, Disposal); work with our business partners to minimise the production of waste where possible and promote the re-use and recycling of waste materials.

WATER QUALITY

Key performance Indicator: All surface water discharge samples will remain within consented limits.

Discharge of pollution into rivers and streams can have potentially harmful consequences to fish and the general river habitat. We have a number of consents that limit the quality of rainwater runoff that we can release to the watercourse. The Environment Agency regularly monitors compliance with these limits. In addition we will seek to minimise the load placed on the environment by ensuring the sensitive storage and use of chemicals.

LANDSCAPE AND ECOLOGY

Key Performance Indicator: The area of land under active ecological and landscape management and enhancement will be maintained or increased.

The airport is a significant landowner. Any development that takes place requires mitigation and compensation measures to be undertaken either in advance, during or immediately following development.

We will further develop our landscape and ecology strategies so that, within the constraints imposed by the normal operation of the airport, we will promote the development of rich and varied habitats around the airport and to promote access to the countryside.

PLANNING

In identifying and setting the targets contained within the Environment Plan, we have taken account of current and emerging legislation, aviation policies and local plans, and existing planning agreements and planning conditions. As part of the Sustainable Development Plan, the airport (and its development partners) will undertake environmental assessment of all major developments in order to effectively understand and mitigate impacts and to ensure that we incorporate environmental standards into the design.

Whilst we are driven by improvements in environmental performance, it is of course essential that we understand the financial implications of our actions. Where possible we have set targets based on absolute totals (eg. tonnes CO₂ produced) rather than on relative measures (eg. CO₂ emissions per passenger). Interim targets will be set internally as part of the business planning process and also within the project management system of an individual scheme.
IMPLEMENTATION

As part of our environmental management system, we have a number of procedures designed to control environmental impacts. In addition we have detailed action plans for individual subjects such as our current energy efficiency programme. Other examples include the Noise Action Plan and Landscape and Ecology Strategies.

We will increase the use of contracts and licences to influence our service partners’ behaviour. This includes our Ground Handling Licence which includes an element of environmental performance monitoring. We conduct environmental reviews and audits with our service partners to jointly identify areas for improvement.

Our design standards ensure that environmental requirements are incorporated into all development and renewal schemes. These are continually reviewed and we work hard to encourage our service partners to adopt these standards.

By including environmental specifications when purchasing goods and services we can also control our impacts.

We will continue to use environmental charges along the ‘polluter pays’ principle and provide incentives to adopt best environmental practice.

We provide training and awareness materials for all staff on issues such as recycling, energy conservation and green commuting. We provide briefings for staff that are tailored for their job and show what they can do to control impacts. We communicate through direct correspondence and meetings, via user groups and through airport newsletters. Our Intranet is as a resource for all staff on site to access environmental information.

CHECKING AND REVIEW

There are many systems for monitoring environmental impacts. These include computer based systems such as our aircraft noise and track monitoring system. We also operate a building management system to control and log energy usage, to control our drainage diversion systems and record water quality. We analyse samples of air and water quality and maintain databases of all information.

Automatic systems alert us to any problems and monitoring helps us take action to ensure compliance with our targets and standards. For example, the source of water contamination might be investigated and eliminated, building temperatures adjusted to conserve energy or a vehicle removed from the airfield pending repairs to control air emissions.

We undertake regular audits of our own, our service partners’ and our contractors’ facilities and activities to check compliance with our standards and agree improvements. Whilst we work in partnership with our service partners, there are occasions where we will use enforcement such as using fines.

As part of our process of continual improvement we regularly review our information and reporting systems. We will publicly report our performance against the main targets in this Environment Plan on our website.

We also meet and report regularly to our regulators and other stakeholders, such as the Environment Agency, local Environmental Health Officers and various external groups such as the Manchester Airport Consultative Committee. We engage in regular constructive dialogue with key stakeholders and our local community and with others that have an interest in the airport.

Our policies and targets cannot stay static, but must respond to changes in the aviation industry, with legislation and government policy, and with costs. Our environmental policies will therefore be reviewed through the annual reporting process to the airport’s senior management team.
OUR PLAN

NOISE

"To limit and reduce where possible, the number of people affected by noise as a result of the airports operation and development”.

INTRODUCTION

Since the 1970s, we have developed a track record of policies and action to manage the noise impact from our operations. The aim has always been to try to keep the noise impact on local residents as low as possible. Measures range from restricting the use of the noisier types of aircraft, charges which encourage the use of quieter aircraft, and regular communication with local communities.

As the airport grows, our policies must evolve so they remain appropriate and effective.

Although aircraft operating today are much quieter than they once were, we recognise that for some people, particularly those who live nearest to the airport, noise is and always will be an important issue.
The main noise-related issues are:

- **Aircraft in the air**
  - Noise from arriving & departing aircraft
  - The number and times of aircraft movements.

- **Track keeping**
  - The paths followed by aircraft and the extent to which they are concentrated or dispersed along those paths
  - The climb or descent profiles adopted by aircraft.

- **Aircraft on the ground**
  - Noise from aircraft taxiing
  - Engine testing
  - Noise from auxiliary power units which power aircraft while they are on stand
  - Reverse thrust which may be needed to slow an aircraft down immediately after landing

Other possible sources of noise impact include road traffic, operation of equipment and construction activity.

**LAWS AND POLICIES**

Aircraft noise is regulated by international agreements, EU and national legislation. Policy and guidelines are set by the UK Civil Aviation Authority (CAA), the International Civil Aviation Organisation (ICAO) and National Air Traffic Services (NATS). At Manchester, additional controls come through locally agreed policies and planning conditions.

The ICAO is the international body that sets noise emission standards which aircraft must meet in order to enter service. ICAO has also set an approach to managing noise which has been adopted world-wide. This ‘balanced approach’ has four key components.

**Figure 2: ICAO Balanced Approach**

An EU directive (EC 2002/30) requires all member states to adopt the ICAO ‘balanced approach’ and ensures that any prohibition of ‘noisier’ aircraft types is strictly controlled in accordance with a detailed set of rules.
NOISE ACTION PLANS


The regulations state that the Noise Action Plan must:

- be drawn up for places near the airport that fall within the 55 dB(A) $L_{den}$ contour or the 50 dB(A) $L_{night}$ contour on noise maps
- be designed to manage noise levels and effects, including reducing noise if necessary; and
- aim to protect any quiet areas which may have been identified as a result of the noise mapping.

Last reviewed in 2013, our Noise Action Plan includes details of all our noise related targets and commitments and reports the progress that we have made against achieving them.

The latest Noise Action Plan is available on our website manchesterairport.co.uk
Performance against individual targets is set out in detail in our Noise Action Plan. We also monitor the number of people who live within the noise contour areas.

In 2005 there were 32,550 people living within the 57 LAeq noise contour (average summer 24-hour period). By 2013 this number had fallen to 23,700 because the area of the 57 LAeq noise contour had reduced. Compared to 2003, the area of the 57 LAeq noise contour has fallen by nearly 10 km² during the day and 2 km² at night.

We have legally binding limits on the size of our noise contour (60 LAeq) as part of our planning permission for Runway 2. These are (33.6 sq km day, 13.0 sq km night). On a voluntary basis, we have set ourselves tighter limits based on the noise contours in 2001 (when the second runway opened). These are a daytime contour of 25.6 sq km and 7.8 sq km at night. Looking ahead, we will contain our future growth within these lower limits. The measures and controls we will take to achieve this are set out in detail in our Noise Action Plan.

**NOISE CONTOURS**

In the same way as geographical maps use contours to distinguish between high ground and low ground, noise maps use contours to identify those areas that are relatively louder or quieter.

Our noise maps and contours are produced by the Civil Aviation Authority. The modelling uses the number and types of aircraft, where they are flying, and the time of day or night, to estimate the noise on the ground around an airport.

Our Second Runway Planning Conditions and our legal Agreements set the 60 LAeq average summer day contour as our key indicator. Additionally, in keeping with Government recommendations, we report the size of the 57 LAeq contour, including its area and the number of people living within it.
AIRCRAFT NOISE

We operate both our runways during the day, with landings on one and departures on the other.

Departing aircraft normally take off into the wind. Our preferred runway direction (that is, aircraft landing land from the east and taking off to the west) reduces the number of departing aircraft flying over more densely populated areas to the north and east of the airport. We also routinely review our runway usage to identify possible opportunities for using just one runway.

DEPARTING AIRCRAFT

Improved engine design has dramatically reduced the level of noise generated by aircraft immediately after take-off. But it remains a major source of disturbance to our local communities.

Like many other airports, we operate a system of what are known as ‘preferred noise routes’ (PNRs). These concentrate aircraft along the lowest possible number of departure routes, and away from more densely populated areas, whenever this is possible. Through working with our airlines and air traffic controllers, we have significantly improved track keeping. In 2013 just 3% of departures flew ‘off track’. We have a system of financial penalties for airlines that persistently fail to keep on the PNRs.

Sometimes, for instance as a result of bad weather, air traffic control may need to operate ‘non-standard’ departures. As these can result in aircraft flying over more densely populated areas, they can be particularly disturbing. For this reason we keep the number of this type of departure to a minimum.

Noise is measured at a number of fixed points around the airport. Beneath each PNR, noise monitors help us measure impact and performance.

Figure 3: Number of people who live within the 57 LAeq noise contour (average summer 24-hour period)
To encourage departing aircraft to be flown in the quietest possible way, we operate a system of noise penalties. The maximum level of noise a departing aircraft is allowed to make depends on the time of day – the night-time limits are lower because we recognise that noise can bother people more at night. We donate any penalties to the Manchester Airport Community Trust Fund.

Figure 4: Downward trend in the noise certification of Aircraft
ARRIVING AIRCRAFT
Unlike take-off, where the bulk of the noise is produced by the engines, when an aircraft is on approach, engine noise and ‘airframe’ contribute equally to the noise level. Airframe noise comes mainly from the aircraft’s undercarriage and wings and is proportionate to the aircraft’s speed as it passes through the air.

All aircraft approaching Manchester Airport are expected to use low-power/ low-drag procedures.

LOW-POWER/LOW-DRAG
Low-power/low-drag is a technique designed to keep airframe noise on approach to a minimum by making sure that the landing flaps are extended and the undercarriage is lowered as late as possible. This reduces drag and means that less engine power is needed. As a result, noise is considerably reduced, both in terms of level and time.

Continuous descent approach (CDA) is a noise reduction strategy for landing aircraft adopted at Manchester Airport. Typically, aircraft reduce their altitude in a series of ‘steps’. For each of these steps there needs to be a noisy burst of engine thrust to level out the aircraft after it has moved to a lower level. With CDA, pilots work out the best possible continuous rate of descent. This means that the aircraft stays as high as possible for longer and reduces the need for periods of engine thrust to keep the aircraft level.

Figure 5: Concept description of continuous descent approach
Lower power settings from higher altitude. No level-off segment.

More details of how we operate can be found in the Runway Data Sheet available on our website.

3 http://www.manchesterairport.co.uk/community/community-links/
AIRCRAFT ON THE GROUND

Ground noise is generated by taxiing aircraft, the use of auxiliary power units (used to provide electricity for the aircraft systems when on stand) and by the testing of aircraft engines after maintenance. For particular areas of the airport site, especially where there are residential properties close by, ground noise can be a source of disturbance.

Airlines are required to avoid the use of reverse thrust as a method of decelerating. Aircraft engine tests can only take place within a specially soundproofed test bay where at all possible, and tests at night are restricted to no more than 20 each year.

Noise from aircraft auxiliary power (APUs) and mobile generators (GPUs) has been reduced through the alternative use of fixed electrical ground power (FEGP mains electricity). In the future this will be reinforced through operational restrictions on the non-essential use of APUs and GPUs.

NIGHT NOISE

Night-time noise is often the most disturbing. So we need a balance between the economic and social benefits that the airport brings and a person’s right to get a good night’s sleep.

We review our night noise policy every five years to make sure that it continues to be relevant.

Our policy is that aircraft noise at night will not go above the levels we recorded in 2001.

Noise controls use a system of classifying aircraft according to their ‘quota count’ (QC). Each aircraft has a ‘quota count’ depending on the noise they generate on take-off and when landing (based on the noise levels measured at the time that aircraft was first introduced). There are seven categories of quota count and these double with each increase of three decibels. In principle, for any season the total number of QC points allowed (the noise budget) could be used for a small number of noisy aircraft or a larger number of quieter aircraft.

We set limits on the total number of QC points between 11.30pm and 6.00am depending on the season.

We also limit the use of aircraft with higher quota counts (QC8 &16). These are banned between 11pm and 7am. Also, aircraft that have a quota count of QC 4 when taking off may not be scheduled to depart between 11.30pm and 6.00am.

Whilst quota counts encourage the use of quieter types of aircraft, there is an equally important need to limit the number of night flights in general. Therefore, we also set seasonal and overall limits for the number of night flights allowed.

REduced ENGINE TAXIING

Aircraft engines can produce huge amounts of thrust. Thrust is used to fly the aircraft in the air and to taxi the aircraft when it is on the ground. With all of an aircraft’s engines running, even at very low power settings, the thrust produced is often more than enough to move the aircraft along the ground.

Because of this ‘surplus’ of power, in the right conditions an engine can be turned off while the aircraft is taxiing to and from the runway. Some airlines already do this at Manchester, and this has benefits both to local noise and air quality.
MITIGATION SCHEMES
We have had sound insulation grant scheme for over 40 years.

Those living close to the airport are offered a contribution towards the cost of insulating their home against aircraft noise. Some other buildings affected by noise, such as schools and hospitals, may also be able to get grants.

Details are available on our website at: http://www.manchesterairport.co.uk/manweb.nsf/Content/SoundInsulationGrantScheme

We continue to provide a vortex damage repair scheme to repair or replace residents’ roofs that have been damaged by aircraft wake vortexes.

VORTEX DAMAGE
When an aircraft travels through the air it causes air turbulence. This can lead to circulating currents of air known as vortexes. Most are broken up before they reach the ground, but sometimes – particularly in the final stages of landing – they can reach roof level, causing tiles to lift or slip. We have identified areas where roofs are most likely to be damaged as a result of vortexes. When it is confirmed that vortexes have damaged a roof, we will immediately repair the roof and give it a vortex-resistant roof covering. In some areas properties may be eligible for re-roofing.

We routinely review properties suffering from both a very high level of noise and a large increase in noise and consider offers to purchase those properties. We also offer a property relocation scheme. This covers the costs of moving house and is designed to help residents in the noisiest areas to move. This was introduced in 2005 and is available to around 200 properties, principally in Heald Green and Wythenshawe.

CONSTRUCTION NOISE
Major construction projects can generate noise disturbance through:

- Demolition
- Excavation and earth moving
- Construction
- Mixing and batching plants
- Crushing plant

When we develop detailed proposals for any major construction projects, we will include assessments of construction noise and the necessary mitigation proposals will be developed.
MONITORING AND REPORTING

We regularly report our performance using the L_{eq} and LA_{eq} measures, but these are not easily understood by non-experts. To help people understand the noise climate around our airport, we will publish ‘Number Above’ contour maps showing the number of times aircraft noise was louder than a given level.

We will also publish flight-path maps. These show the number of flights into and out of the airport and where they flew. They allow people to see which areas are flown over and how frequently this can be expected to happen. As well as the more familiar noise contours we also report performance indicators based upon average departure noise levels, recorded each month or the noisiest departures over a full summer or winter season.

Over time our monitoring systems and the ways in which we use them have developed. The MANTIS system monitors and reports on noise from aircraft, and checks and records the path of every aircraft within 30 kilometres of the airport, up to a height of 12,000 feet. It automatically flags aircraft that exceed our noise limits, stray from our ‘preferred noise routes’ (PNRs) or don’t follow a continuous descent approach.

Effectively sharing information is vital to the success of our noise policy. We will continue to improve our monitoring and reporting systems. In 2015 we completed an upgrade to our MANTIS system and have introduced a web-based facility to allow members of the community to access information about where aircraft fly and the noise levels they have made. We will continue to report our performance within the annual M.A.G Corporate Social Responsibility (CSR) report.
OUR OBJECTIVES

CLIMATE CHANGE

We will continue to reduce greenhouse gas emissions by increasing efficiency and obtaining energy from renewable sources”.

CONTEXT

Aviation is estimated to contribute about 2% of global greenhouse gas (GHG) emissions, 5% of which is from airport operations. The forecast growth of air transport and efforts to de-carbonise other industries however, mean that aviation’s contribution is expected to rise, to around 3% of global emissions by 2050.

Some of these emissions are within our direct control, such as the energy and fuel we use. Whilst other emissions are out of our direct control, we can influence them, for example energy used by tenants and emissions generated by aircraft whilst on the ground.

GREENHOUSE GASES

The term ‘greenhouse gas’ (GHG) refers to a number of substances which retain heat within the earth’s atmosphere and contribute to climate change.

The Kyoto Protocol specifies six gases, which are cumulatively referred to as GHGs:

- Carbon dioxide (CO₂)
- Methane (CH₄)
- Nitrous oxide (N₂O)
- Hydrofluorocarbons (HFCs)
- Perfluorocarbons (PFCs); and
- Sulphur hexafluoride (SF₆)

Whilst CO₂ is the most widely reported GHG, the climate change impacts of other gases are also very important. GHG emissions can be reported individually for each substance however it is often helpful to consider the impact of emissions relative to those of CO₂. To provide a single measure of GHG emissions, emissions are often reported in terms of ‘carbon dioxide equivalent’ (CO₂e).
**OUR OBJECTIVES**

**CLIMATE CHANGE**

**LEGISLATION AND POLICY FRAMEWORK**

The Climate Change Act (2008) requires CO₂ emission reductions of 80% compared to 1990 levels by 2050 with an interim reduction target of 26% by 2020.

The Government’s objective is to ensure that the aviation sector makes a significant and cost-effective contribution towards reducing global emissions. As part of this, aviation has been included within the European Union Emissions Trading System (EU ETS) since 2012, covering all emissions from flights to and from EU airports. Airlines can either reduce their own emissions or purchase allowances or credits from other sectors where options for reducing CO₂ emissions are easier to deliver.

However in November 2012, the EU announced it would suspend the rule for a year to allow the International Civil Aviation Organisation (ICAO) time to agree a global deal to tackle aviation emissions. ICAO is working towards the introduction by 2020 of a global scheme. In response to this progress the EU ETS may be amended to cover only flights within the EU from 2014-2020.

Our energy use is covered by the EU ETS and the Carbon Reduction Commitment (CRC) Energy Efficiency Scheme.

M.A.G is a founding member of Sustainable Aviation⁴, which is the first pan industry alliance of its type in the world, including aircraft and engine manufacturers, airlines, airports and air navigation service providers. Sustainable Aviation has recently updated its Carbon Roadmap, which demonstrates that it is possible for UK aviation to accommodate significant growth to 2050 without a significant increase in CO₂ emissions. Through market-based policies it will be possible to reduce absolute emissions by 50% from 2005 levels. The Roadmap provides the basis for us to help us reduce GHG emissions within the industry as a whole.

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⁴ Sustainable Aviation is a long term strategy for the UK aviation industry, bringing together airlines, airports, manufacturers and air traffic service providers.
OUR OBJECTIVES

CLIMATE CHANGE

OUR CARBON FOOTPRINT

We were the first airport in the UK to publish our carbon footprint. This is produced annually and independently verified.

It covers direct emissions from our consumption of fuel (in vehicles and boilers) and electricity. These Scope 1 and 2 emissions, over which we have direct control, make up only a small percentage of those reported. The vast majority of airport emissions are considered as Scope 3. We have no direct control over these emissions but can work with our customers, business partners and suppliers to influence their operations. This includes the landing and take-off cycle (LTO) of flights into and out of the airport.

Figure 6: Carbon footprint

Figure 7: Carbon footprint, Manchester Airport 2013-14 (tonnes CO₂)¹

¹ 2013-2014 figures not audited at time of publication.
OUR OBJECTIVES

CLIMATE CHANGE

HOW WE MANAGE OUR CLIMATE CHANGE IMPACTS

Our aim is to continue to reduce our own energy and fuel consumption by increasing operational efficiencies and to source our energy supplies from renewable sources or where this is not possible to off-set net Scope 1 and 2 emissions by purchasing carbon offsets.

CARBON EFFICIENCY IN BUILDINGS

Since the publication of our last Environment Plan, over 20 energy efficiency projects have reduced our electricity consumption by 24% (60,000 tonnes) compared to 2005 levels. Projects have included installing energy efficient hand driers, energy efficient lighting across terminals and car parks, improvements to air handling systems and lighting controls.

Our energy efficiency programme includes installing intelligent building controls that link flight information with building controls so that terminal areas are only lit and ventilated when flights are operating, and reduce to minimum levels at other times. This could reduce our CO₂ footprint by an additional 3,027 tonnes per year.

We are working with suppliers to develop new innovative products and will capitalise on new technology as it comes to market.

Automated metering systems, introduced in 2012, provide accurate metering of energy use within buildings across the site and allow local budget control. This will encourage improved behaviours in relation to energy efficiency. It also ensures users see the benefits of individual energy reduction schemes.

New buildings include energy efficiency measures from the design stage. New buildings are assessed through the Building Research Establishments Environmental Assessment Methodology (BREEAM), which has become the industry standard. Our target for new buildings is BREEAM rating ‘Excellent’ but sometimes the unique nature of some airport buildings makes it difficult to achieve. Our minimum standard will be ‘Very Good’.

We have developed a wealth of knowledge and share this with our partners on site through our Carbon Challenge initiative which fosters a collaborative approach amongst the airport community. 100% of our electricity is already sourced from renewable supplies. We believe that this makes an important contribution to reducing our CO₂ emissions. We will identify and evaluate opportunities to generate renewable energy on-site where possible.

CARBON EFFICIENCY IN OUR VEHICLE FLEET

CO₂ emissions from airport vehicles are a small percentage of the total for the airport but this is a source that we can readily control and influence. Many vehicles are already using electric or hybrid technologies such as the electric baggage tugs or our fleet of hybrid busses. Our own fleet of 118 operational vehicles is nearly all fuelled by diesel. We will develop and implement a Sustainable Vehicle Policy that ensures that our vehicles meet either the current or previous Euro emission standard and that hybrid or alternatively fuelled vehicles are purchased where appropriate. These measures will also reduce local air quality impacts. We already promote green driving techniques and operate a switch off policy on the airfield and will promote the use of alternative fuelled vehicles by tenants.
OUR OBJECTIVES

CLIMATE CHANGE

CARBON EFFICIENCY IN STAFF AND PASSENGER JOURNEYS
Access to the airport continues to be dominated by the car. We wish to reduce the dependence on the car and secure a major increase in public transport use. This will reduce carbon emissions and local pollution, avoid congestion and improve choice. Measures to achieve this are set out in our Economy and Surface Access plan.

CARBON EFFICIENCY IN AIRCRAFT OPERATIONS
We work with airlines to help them reduce aircraft emissions.

Our Collaborative Environmental Management (CEM) group, championed by Eurocontrol, brings together air traffic controllers, airlines, ground handlers and representatives of the airport. CEM is assisting implementation of industry standards, including departure and arrival codes of practice, use of continuous descent approach, reducing taxiing and promoting the use of electrical ground power. These and other initiatives reduce fuel consumption, noise and emissions.

We are also working with Eurocontrol and the wider industry to implement the collaborative decision making (CDM) process. By sharing information CDM will enable more optimised flight plans that reduce aircraft holding on the ground and in the air, and more direct (and therefore shorter) flight routings, all reducing aircraft fuel consumption.

We manage the airfield to reduce congestion, including operating Runway 2 when required and are moving airfield roadways to head of stand where possible. We will also be looking at future taxiway alignments that can reduce taxiing and hold times.

MONITORING AND REPORTING
We will continue to monitor, and annually report our GHG emissions in our Corporate Social Responsibility Report.

Since publishing our last Environment Plan, the Government has published revised environmental reporting guidelines and introduced mandatory reporting of GHG emissions for some businesses. While mandatory reporting requirements do not apply to our business, we will follow Government’s guidelines in our own reports.

We will also report our net Scope 1 and 2 emissions and also report Scope 3 emissions resulting from passenger surface access and aircraft operations during the landing and take-off cycle.

We currently hold, and will maintain, certification to Airport Carbon Accreditation (Optimisation level) and the Carbon Trust Standard. Participation in these schemes is important to us as it validates the significant efforts we have made to reduce energy consumption and carbon emissions.
Air quality can be affected by a number of different pollutants that in high concentrations can cause harm to human health. The majority are produced during combustion processes.

**AIR POLLUTANTS**

- oxides of nitrogen (NOx)
- nitrogen dioxide (NO₂)
- particulate matter (PM₁₀ and PM₂.₅)
- volatile organic compounds (specifically non-methane VOCs)
- carbon monoxide (CO)
- sulphur dioxide (SO₂)
- lead (Pb)
- benzene (C₆H₆)
- 1, 3-butadiene
- Ozone (O₃)

When the levels of these pollutants are high, some people may experience eye irritation, lung irritation and breathing difficulties. These symptoms will be experienced most by people with existing conditions such as lung disease, asthma and heart conditions.
OUR OBJECTIVES

AIR QUALITY

Some air pollutants contribute to the formation of ground level ozone, a secondary pollutant that is also harmful to health. In addition, pollutants such as NO₂ and SO₂ react in the atmosphere to form ‘acid rain’ that can harm ecosystems.

The main airport-related sources of emissions are:

- Staff and passenger journeys
- Aircraft engines, auxiliary power units (APU) operation and engine testing;
- Exhaust emissions from operational vehicles;
- Energy generation equipment: diesel generators, boilers;
- Fugitive emissions (evaporation) during fuelling of vehicles and aircraft, and;
- Miscellaneous emissions from activities such as aircraft fire training.

Air quality is significantly affected by emissions from vehicles using the local road network, especially the M56, even though a relatively small proportion of this traffic is associated with the airport. Particulate matter concentrations can even be due to sources outside the UK.

Carbon dioxide (CO₂) is produced by many of the same sources and whilst it does not affect local air quality, it is the principal gas causing climate change.

As a large site, with over 300 companies, we recognise the need to not only address our own operation, but to work collaboratively with service partners to implement best in class technologies and working practices across the site to reduce local air quality emissions.

LEGAL AND POLICY FRAMEWORK

In order to protect human health, air quality standards are set at an EU and UK level. The pollutants and objectives most relevant to airport operations are NO₂ and PM₁₀. Most pollutants have a short term (hourly or daily) and long term (annual) objective that reflects the scientific assessment of how these pollutants impact on health.

<table>
<thead>
<tr>
<th>CONCENTRATION</th>
<th>MEASURED AS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nitrogen dioxide (NO₂)</td>
<td>40 μgm⁻³ Annual mean (long-term)</td>
</tr>
<tr>
<td>Particulate matter (PM₁₀)</td>
<td>40 μgm⁻³ Annual mean (long-term)</td>
</tr>
<tr>
<td>200 μgm⁻³ with up to 18 exceedances per year</td>
<td>1 hour mean (short-term)</td>
</tr>
<tr>
<td>50 μgm⁻³ with up to 35 exceedances per year</td>
<td>24 hour mean (short-term)</td>
</tr>
</tbody>
</table>

Figure 8: Air Quality Standards Regulations (2010) air quality objectives
Air Quality

Local authorities are responsible for local air quality, conducting reviews and assessments of local levels against national objectives. Where exceedances are predicted to occur in residential areas, local authorities have a duty to declare Air Quality Management Areas (AQMA) and produce an Air Quality Action Plan (AQAP).

The Greater Manchester Air Quality Management Area is based on a modelled 35 μgm⁻³ annual mean NO₂ exceedance contour. It includes parts of the airport (runways, taxiways and terminal areas) due to high concentration of emissions.

“[The Government’s] policy on air quality is to seek improved international standards to reduce emissions from aircraft and vehicles and to work with airports and local authorities as appropriate to improve air quality, including encouraging HGV, bus and taxi operators to replace or retrofit with pollution-reducing technology older, more polluting vehicles”.

Aviation Policy Framework, 2013
OUR OBJECTIVES

HOW WE MANAGE AIR QUALITY

OUR VEHICLE FLEET
We have a fleet of 118 operational vehicles. Increasingly stringent emissions standards have seen this fleet become cleaner over the years. European standard Euro V was introduced for vehicles certified after 2008. A newer standard, Euro VI, applies to vehicles certified from 2014. This will deliver an 80% reduction in NOx emissions and also halve particulate emissions. Low emission vehicles are now on the market and manufacturers are working on improvements to electric vehicles and hydrogen powered vehicles.

We were the first airport in the UK to operate diesel/electric hybrid busses and will be introducing other low emission vehicles at the airport. We will develop and implement a Sustainable Vehicle Policy. Our aim is to have a vehicle fleet that is no older than 6 years, or retrofitting exhaust abatement equipment where appropriate.

AIRSIDE VEHICLES AND EQUIPMENT
95% of airport vehicles are operated by third parties such as airline handling agents. We work with operators to enable the operation of cleaner fleets.

All vehicles operating on the airfield undergo regular inspections, including an emissions test. Our airfield operations team carry out ad hoc inspections, banning vehicles which fail to meet MOT emission standards. They also enforce our vehicle ‘switch off’ policy, ensuring that stationary vehicles are turned off. We are working with our service partners on new controls and codes of practice.

AIRCRAFT
Aircraft exhaust emissions are the dominant source of NOx on the airfield. The majority of these are from aircraft taking off and climbing up to 200m above ground level at which point the emissions have a negligible effect on the ground. Aircraft landing and taxiing produce less NOx by comparison.

ICAO have recently introduced new standards that will see a 15% improvement in NOx emissions, whilst ACARE (Advisory Council for Aeronautics Research in Europe) has targeted an 80% reduction in NOx emissions from commercial aircraft by 2020. How we manage aircraft emissions is described within the Climate Change chapter of this Plan.

SURFACE ACCESS TO AND FROM THE AIRPORT
We promote the use of sustainable transport by airport staff and passengers. Our Surface Access Plan outlines the measures we are taking on surface access, and which will have benefits in improving local air quality.
HOW WE MANAGE AIR QUALITY

MONITORING AND REPORTING

We carry out on-site monitoring of nitrogen dioxide through diffusion tube surveys and additional pollutants are monitored as required to assess compliance with legislation.

Jointly with Manchester City Council, we maintain an air quality monitoring station near the airport that forms part of a national network. NO₂, SO₂, PM₁₀, PM₂.₅, and O₃ are monitored. Data and annual statistics can be viewed on the national air quality web site⁶.

We will continue to assist local authorities with their air quality reviews. We provide data and support joint modelling work, and assist in the annual update of the Greater Manchester Emissions Inventory (EMIGMA). We also support the Greater Manchester Air Quality Action Plan and Cheshire East Council’s Local Air Quality Strategy.

We will continue to compile an annual emissions inventory of all airport emissions and produce an annual air quality monitoring report for local Environmental Health Officers. We also will continue to develop our modelling capability to more fully understand our impact on local air quality. We will report our impacts on air quality through our annual Corporate Social Responsibility Report.

⁶http://uk-air.defra.gov.uk/
INTRODUCTION
Airports are like small towns in terms of the range of businesses and activities that operate. We manage the waste from our own, and many of our tenants’ activities, including the following:

- Aircraft cleaning and catering
- Terminal cleaning
- Office cleaning
- Terminal retail and catering
- Maintenance activities
- Cargo handling

The types of waste include packaging, food, newspapers, pallets, metals and green waste. Additionally hazardous, clinical, liquid and construction wastes are generated on the site.

LEGAL AND POLICY FRAMEWORK
Waste and recycling are regulated by a wide range of EU Directives and UK regulations aimed at reducing waste, reducing reliance on landfill for disposal and auditing to ensure waste is handled and recycled or recovered in a responsible manner. Changes in legislation and the Landfill Tax provide financial incentives to increase recycling and recovery.

Aircraft waste is subject to additional controls to prevent the spread of animal diseases. Any cleaning waste from outside the EU that contains certain food items is considered Category 1 International Catering Waste (ICW). There are tight controls on storage, transport and disposal of this type of waste, which must be disposed in specifically licensed landfill or incinerator. Any recycling or recovery of this waste must be undertaken within the controls set by the legislation and DEFRA’s guidance.
Our objectives

Waste Management

How we manage waste

Our target is that none of our waste goes to landfill’. We use the waste hierarchy.

Reduce – eliminating waste generation in the first place. As electronic communications improve, the amount of paper being used across the site has fallen significantly.

Reuse – we salvage materials for reuse as spares and donate surplus items such as furniture and working electrical equipment to local charities. Clothing discarded by passengers at check in when they realise they have misjudged their baggage allowance is sent to a clothing bank provided by a local hospice.

Recycle – we provide recycling facilities for 13 separate materials. This includes containers for card and glass from retail and catering and lamp banks for the 10,000 fluorescent tubes generated annually. By sorting, bulking and baling some materials, we have reduced transport costs and now raise income from materials such as cardboard, paper and plastic bottles.

Recover – residual waste from terminal and offices goes off-site to a recovery plant where it is processed before being burnt with energy recovery.

Disposal – currently Cat 1 ICW goes to landfill, along with the residue from the recovery process, although we are working with our contractor to identify non-landfill alternatives.

Recycling projects

Since the last Environment Plan, we have increased our landfill diversion rate from 16% to 71% by:

- Installation of 125 bespoke recycling bins across the terminals. We were the first recycling SuperZone under the Coca Cola funded Recycle on the Go initiative.
- Separate collection of plastic bottles and aerosols discarded by passengers. Combined with on-site baling of the bottles, the project delivered an 86% reduction in the weight of this waste.
- A central waste management contract with a single contractor responsible for on-site management and recycling and disposal of all non-hazardous and several hazardous waste streams.
- We have co-ordinated a group of UK airlines and airports to help cabin crew collect materials for recycling on-board the aircraft in a way that complies with the Animal By-products legislation.
- Inspection of aircraft cleaning waste and sorting of any bags that do not contain food to recover recyclables.

Figure 9: Waste Hierarchy


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Excluding ICW, where no other options are available
OUR OBJECTIVES

WASTE MANAGEMENT

We provide bulk containers for recyclables for use by retail and catering companies, and provide a mixed recycling bin service to our tenants within the office blocks and the world freight terminal. All our containers and our publicity material literature on recycling use the national branding (WRAP) for recycling so it makes it more recognisable for airport passengers, staff and service partners, leading to improved quality and quantity of recyclables.

We will introduce an on-site Material Recycling Facility (MRF) to divert more aircraft cleaning waste away from landfill, and increase recycling.

The amount of waste generated is strongly linked to passenger numbers. The types of service provided by airlines can also have an impact – there is less on-board catering than several years ago and fewer free newspapers distributed. Although we will try to reduce the amount of waste generated, we anticipate that higher passenger numbers will lead to an overall increase in the waste tonnage.

Most waste is generated by service partner’s operations and we work with them and their cleaning companies to encourage recycling. We are looking at transparent charging systems based on the polluter pays principle which incentivises waste reduction and recycling.

TARGET Send no waste to landfill after 2018 (excluding International Catering Waste, where no other options are available)

We will continue to manage waste according to the waste hierarchy, but with a focus on reducing and recovering costs and reducing landfill. Our target is to not send any waste to landfill by 2018. However, this is currently the only option for Cat 1 ICW; as there is not a suitably licenced incinerator in the area. Some hazardous wastes are generated on the site, including waste oils, solvents and oily liquid wastes. We do not handle hazardous wastes generated by tenant companies, but do check storage, transport and disposal arrangements.

We comply with permits and licences and make sure that all waste is transported in accordance with Duty of Care and Hazardous Waste requirements.

MONITORING & REPORTING

We collect detailed information on waste generation and recycling rates. Waste to landfill has decreased from 84% in 2006 to 29% in 2014. Further details are in our annual Corporate Social Responsibility Report and the aircraft waste recycling programme is also reported through Sustainable Aviation. We will enhance our carbon reporting by the inclusion of waste within Scope 3 emissions.
INTRODUCTION

Around 520,000 m³ of water is used each year, mainly in the terminals for toilets and washing. Around 15% is associated with tenant activities such as catering, hotels and aircraft de-icing and washing. Currently, almost all of this is “mains” potable water and is returned to the foul sewer for treatment at United Utilities’ Davyhulme wastewater treatment works.

Rainwater runoff is discharged into the River Bollin and a number of small streams bordering the site. These watercourses support a variety of wildlife including fish, and the Bollin Valley is also used for recreation by walkers.

There are many potential sources of surface water or groundwater pollution including:

- Chemicals used for aircraft and airfield anti-icing and de-icing;
- Detergents used in aircraft and vehicle washing and general cleaning;
- Chemicals and oils from aircraft and vehicle maintenance;
- Silt, chemicals and fuels from construction activities;
- Spillages of fuel and sewage from aircraft and service vehicles;
- Leaks from inappropriate storage of chemicals and fuel;
- Fire fighting foam, mainly from training.

We manage these impacts to divert runoff contaminated with these chemicals away from watercourses to avoid pollution.

LEGAL AND POLICY FRAMEWORK

The Water Framework Directive sets a strategy to manage the whole water cycle within a river basin. The main aims are to:

- Promote the sustainable use of water;
- Reduce pollution and improve aquatic ecosystems;
- Reduce the effects of floods and droughts.

The Environment Agency is working to improve water quality in the Mersey catchment within which the airport lies.

Climate change could reduce water availability, but also increase the frequency and intensity of rainfall events. As a major transport infrastructure operator, we are part of the Government’s climate change adaptation plans.

The Environment Agency control the quality of discharges to surface water or groundwater and can prosecute anyone who “causes or knowingly permits” pollution to occur. We have very tight limits on the quality of surface water that we send to local watercourses, including the River Bollin. United Utilities control our discharge of surface water and trade effluents to the foul sewer.
OUR RESOURCES

WATER RESOURCES

HOW WE MANAGE WATER USE

Water is largely supplied from the Lake District by United Utilities (UU). Our private pipe network serves most. We are working with UU to reduce our peak demands, while accommodating airport growth.

Our toilets have water savings devices installed and our leak detection programme ensures quick detection and repair. Water efficiency of all new developments will exceed current building regulations levels. We have upgraded water meters on many tenant properties and also installed a number of sub-meters within the areas we control. The meters are read automatically and give detailed information that can be used to calculate consumption, help to identify conservation opportunities as well as promoting good practice through effective and accurate billing.

Rainwater harvesting captures rainfall for uses such as toilet flushing where treated drinking water is not necessary. There are no costs for the water, but a separate water tank, filtration and plumbing system is needed.

We will continue to reduce our water use. We will be installing more sub-meters, which will allow us to build up a more detailed picture of where water use is highest and where additional efficiency measures should be focussed. We will reduce water consumption per passenger within the terminal areas, but recognise that our total water use is likely to increase as passenger numbers grow.

HOW WE MANAGE SURFACE WATER DRAINAGE

Rainfall runoff from the site is carried via a separate surface water system to a number of different streams and rivers around the site. Oil interceptors remove any oil and fuel, and in some locations, there is balancing storage to attenuate peak flow rates during heavy rainfall.

We have two small rainwater harvesting /grey water systems in operation. Retro-fitting such systems to the existing terminal buildings are expensive and difficult, but we will install new systems as part of the planned future terminal development and refurbishment where possible.

Figure 10: Drainage Catchments at Manchester Airport
The main water pollution source on site is anti-icing and de-icing chemicals. We have changed to less polluting products and will continue to review what alternatives are available. Runoff that is contaminated with anti-icing and de-icing chemicals is diverted into our containment system and via a large balancing reservoir into the public sewer for treatment at UU’s wastewater treatment works.

We are currently looking at ways to treat runoff on-site, although the quantities and variability of the quality of this discharge make this challenging. We are also considering whether centralised aircraft de-icing would help reduce the volume of contaminated run-off.

A comprehensive drainage management system allows us to continuously monitor and control run-off. Water quality monitors to help us manage the system effectively, and supplement this with sampling at all of our outfalls ensures compliance with our environmental permits. We are investing in new monitoring equipment to allow us to optimise the amount discharged to sewer whilst complying with our environmental permits.

Our drainage system is extensive and includes the following elements:

- >28km of surface/foul drainage networks
- 7 separate surface water catchment areas
- 6 consented surface water discharge outfalls
- 18 foul pump stations
- 10 surface water pump stations
- >40 penstocks and actuators on the containment system
- >30 oil interceptors
- >3000 manholes
- 4 surface water lagoons
- 2 storage reservoirs
As part of our Environmental Management System, we audit our own and our tenants’ facilities and operations to check that pollution risks are controlled, including from bulk storage tanks. We also make sure that all aircraft and vehicle washing activities only take place where the drainage is diverted to the foul sewer. We periodically review what chemicals we use, including airfield anti-icing products and fire-fighting foams and will be changing to more environmentally beneficial products where possible.

We have robust fuel spill response procedures and test these as part of our emergency planning process.

We regularly review our drainage model and drainage capacity, and will be undertaking some detailed work to understand how our drainage systems will need to be altered and managed to deal with any increased volumes of runoff associated with future airport development. As part of this, we will consider the impacts of climate change on weather events. Adequate attenuation of runoff will be provided for all new developments.

MONITORING AND REPORTING

We will continue to regularly discuss drainage issues and compliance with the Environment Agency and United Utilities. We will also continue to report our water consumption and surface water compliance within our annual Corporate Social Responsibility Report.

100% Compliance with environmental permits
OUR APPROACH

ECOLOGY, LANDSCAPE AND CULTURAL HERITAGE

To limit our effects on nature conservation, landscape, archaeological resources and cultural heritage and where possible, to create new features and enhance the ecological and landscape value of the area.

BACKGROUND

The airport lies in the northern part of the Cheshire Plain, a gently undulating area with an open pastoral landscape, punctuated with scattered farms and dwellings. The main exceptions to this pattern are the historic estates of Tatton and Styal, the airport complex, the urban fringe and the Bollin Valley. The underlying sedimentary rocks are Keuper Marls of Triassic origin including Mercia Mudstones, these are overlain by an uneven layer of boulder clay. The River Bollin flows underneath the second runway through a tunnel 24m wide and 240m long. Downstream of the tunnel, the river valley is characterised by recently enhanced channel and valley features. Upstream of the tunnel the river flows through an open valley some 300m wide characterised by a series of oxbow lakes, farmland and wooded sides.

Our non-operational land holding extends to some 380 hectares of principally arable land, woodland and wildflower grassland. The majority is managed as an ecological and landscape resource for the local area and provides a rich and varied network of habitats through which animals and plants can move around.
OUR APPROACH

ECOLOGY, LANDSCAPE AND CULTURAL HERITAGE

POLICY FRAMEWORK

The Government published the first Natural Environment White Paper for 20 years in 2011 – The Natural Choice: Securing the Value of Nature – which shifted the emphasis from piecemeal conservation action towards a more integrated landscape-scale approach. The White Paper aims to improve the quality of the natural environment across England, halt the decline in habitats and species, and strengthen the connection between people and nature. Government believe this will create a radical shift on how we view our natural assets by incorporating the natural environment into economic planning and ensuring there are opportunities for businesses that are good for nature and good for a strong green economy.

At a local level, Manchester City Council’s Core Strategy states that “In order that the environmental impacts of airport expansion are minimised, all development needs to consider its impact in terms of ecology, air quality and noise”. We intend to further develop our ecology and landscape policies in line with Manchester and Cheshire East Biodiversity Strategies.

LANDSCAPE AND HABITAT MANAGEMENT PLAN

This guides the management of our non operational land holdings. The aims are to maximise wildlife, visual and amenity benefits, whilst being consistent with the demands of the airport in terms of safety and security. This relies on the continued management by our tenant farmers of much of the land for productive agriculture, mostly pastoral farming.

Our plan is essentially ecology led as it was developed from the ecological mitigation works associated with the development of the second runway. As a result we have extensive experience of habitat creation and long term monitoring which we are using to mitigate the environmental impacts of current developments including the World Logistics Hub and a new surface car park. Ecological surveys are always undertaken on land proposed for new development.

Across our rural estate we have created or restored over 130 ponds which now provide an important resource for amphibian and aquatic invertebrate species including the great crested newt which receives special legal protection. Our policy is that for every pond that is lost to development we will either create two new or restore two existing ponds, as suitable habitats for amphibians and continue to maintain them as such.

We have successfully built three new barns to act as roost sites for bats, two of these are nursery roosts for pipistrelle bats and one for brown long eared bats. We have recently finished building a fourth barn designed for pipistrelle bats. The barns have been supplemented by the erection of 260 bat boxes within woodlands around the site. We will monitor and maintain the new barn and boxes to ensure that they remain suitable for bats.

Badgers are also legally protected. We encourage badgers onto our landholding and we will continue to ensure that the badger population remains unaffected by airport operations.

Our plans include the strengthening and improvement of the existing landscape features and creation of new features such as woodland, grassland or hedgerows. We are currently planting an additional 6 hectares of woodland and scrub around the World Logistics Hub which will supplement the 50 hectares that we have planted over the last 20 years.

We have exposed one Regionally Important Geological and Geomorphological Site in the Bollin Valley and allow educational access. We will undertake detailed assessments to identify if similar opportunities exist.

Our long-term commitment is demonstrated by being the only airport in the country to employ our own ecologist and in our commitment to extend the LHMP through to 2030.

<table>
<thead>
<tr>
<th>Feature</th>
<th>Number</th>
<th>Area or Length</th>
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<tbody>
<tr>
<td>Existing hedgerows</td>
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<td>31.9 km</td>
</tr>
<tr>
<td>New hedgerows</td>
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<tr>
<td>Translocated woodland</td>
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<tr>
<td>Grassland translocation</td>
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<tr>
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<tr>
<td>Other existing ponds</td>
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Figure 11: Schedule of Ecological Works Undertaken
ECOLOGY

Part of a national Site of Special Scientific Interest (Cotteril Clough) to the west of the aircraft maintenance area and two local sites of ecological interest (Ponds near Manchester Airport Runway (Grade C) and Marl Pit near Cotteril Clough (Grade A) lie within the Operational Area of the airport.

Our approach to development is to avoid any direct impact to these sites and to minimise as far as possible any secondary effects. Given the overall importance and interest of the SSSI the ecological approach is to increase its quality and bio-diversity. Future land uses will avoid the SSSI and include clear boundaries for protection and enhancement works.

Other designated sites of ecological importance in the vicinity of the airport include:

- Sunbank Wood (Grade A Site of Biological Importance or SBI);
- Castle Hill Road Cutting (Grade A SBI);
- Well and Double Woods (Grade A SBI);
- Hooksbank Wood (Grade A SBI);
- Arthur’s Wood SBI;
- Holly Bank Wood (Grade A SBI).

Where these are not within our land ownership we will work with the landowners to support the management of the sites. We will also continue to work with and support the National Trust with their objective of managing the countryside of the Bollin Valley & Styal estate.

LANDSCAPE

Landscape is important in order to enhance the airport’s setting, particular attention will be paid to the main gateways, transport corridors and sections of the perimeter that are close to residential areas. Our aims are to:

- Minimise the visual impact on the surrounding countryside and on people nearby;
- Enhance the overall appearance and image of the airport;
- Provide a framework which allows visitors and staff to use the airport with maximum ease and efficiency;
- Provide a framework within which all new development can be located in a co-ordinated way; and
- Ensure that the landscape in and around the airport is designed and managed so as not to prejudice aircraft safety.

We predominately use native plantings to ensure that new planting blends with the surrounding countryside and contributes to the ecology and habitat diversity of the area. Our plantings are designed not only to screen and soften the appearance of the airport but also to prevent vantage points for plane spotters and the disturbance that they can cause to local residents.
OUR APPROACH

ECOLOGY, LANDSCAPE AND CULTURAL HERITAGE

Around the terminal complexes, we plant and maintain bold formal arrangements of trees such as birch, horse chestnut, whitebeam and lime to frame or control views and to encourage efficient movement along the internal roads. These are supplemented with principally ornamental shrub species to provide colour, form and shape.

Our landscape areas are managed to the highest possible standards particularly in regard to safety and security. Our Landscape Design Guide will be maintained to give strategic guidance on landscape issues.

We recognise that the area covered by the LHMP is an important recreational area for local people because of the network of adopted and permissive footpaths and bridleways. We will continue to encourage their use and to erect interpretation boards to explain the ecological interest of the area. We will use our links with the local community to promote its use as Natural Accessible Green space.

ARCHAEOLOGY

During the construction of the Second Runway, archaeological sites were discovered at the former Oversley Ford Brickworks and also within the Bollin Valley. Archaeological surveys prior to and during development were undertaken recording any features found. This procedure will be incorporated into any future major developments.

LISTED BUILDINGS

There are several Listed Buildings within the Operational Area. They are all listed Grade 2 and are:

- 1-2 Hale Top Cottages, Thorley Lane;
- Rose Cottage, Hasty Lane; and
- Cloughbank Farm, Old Wilmslow Road.

Special permission is needed for works to Listed Buildings. During the construction of the Second Runway, three high quality timber-framed Listed Buildings were dismantled and reconstructed elsewhere. Preliminary surveys indicate that due to the condition and construction of the remaining buildings this is not a viable option. However the buildings will be fully surveyed and recorded.

In addition to the Listed Buildings, The Church of Ringway St Mary is located on Sunbank Lane and is subject to normal Listed Building controls. We recognise the sensitivities of this site and its local importance. We will ensure that the site and graveyard is protected and we intend to put substantial levels of environmental mitigation in place as part of any future development schemes.

There are a number of important local heritage sites which are affected by airport activity. These include the National Trust properties at Tatton Park, Dunham Massey and Quarry Bank Mill. We will work closely with the National Trust and Cheshire East Council to minimise the adverse effects of airport operations and promote areas of benefit, including support for their growth as major tourist and recreational destinations.
ECOLOGY, LANDSCAPE AND CULTURAL HERITAGE

8.9 SPECTATOR FACILITIES

There remains a continuing demand for facilities to accommodate visitors and spectators. Viewing facilities are provided at the Runway Visitor Park on Old Wilmslow Road. Providing viewing facilities helps remove pressure from the central terminal complex and from the local road network.

The Runway Visitor Park provides a wide range of attractions for visitors and spectators. These include several static aircraft exhibits, the highlight of which is one of British Airways’ Concorde aircraft. The Visitor Park may be relocated from its current location to a new site south of the Second Runway from where visitors could access the footpath and bridleway network within the LHMP area and we will promote the use of these by visitors.
The draft Sustainable Development Plan is an important document for us. It helps set out what our aspirations are for Manchester Airport. There are many stakeholders who have an interest in the airport and the views and comments from Government, Local Authorities, neighbours, the business community and customers are an important part of the planning process. The airport is committed to being open in sharing the vision for Manchester Airport and the local area. The plan looks to where possible, reflect local views and ideas.

Neighbours, stakeholders and a wide range of organisations in the region are to be consulted to obtain their views. This will include public events, informal and formal briefings. The draft Sustainable Development Plan documents will be made widely available.

The closing date for comments is 1st September 2015. After that, we will carefully consider all the comments we receive. We expect to publish a final version of the Plan in the third quarter of.

To obtain copies of the draft Sustainable Development Plan or contact us about its content:
Visit:  www.manchesterairport.co.uk/developmentplan
Write:  Planning
        Olympic House
        Manchester Airport
        Manchester
        M90 1QX
email:  developmentplan@manairport.co.uk

A number of specific questions are set out below relating to the draft Environment Plan. But we also want to hear views more generally on our approach, the issues and the various targets and policies we propose.

- Do you have any comments on our proposals for managing our Environmental impacts?
- Are there any additional issues that you think the Environment Plan should address?
- Are there any additional initiatives that you think we should consider for inclusion in the Environment Plan?
- In terms of priorities, which of the issues or initiatives we have identified in the Environment Plan do you think are the highest priority?