ATKINS

Airports

Plan Design Enable

Who we are >

Atkins is a multinational engineering and design consultancy, providing expertise to help resolve complex challenges presented by the built and natural environment.

Whether it's the concept for a new skyscraper, the upgrade of a rail network, the modelling of a flood defence system or the improvement of a management process, we plan, design and enable solutions.

Founded in 1938 by Sir William Atkins, Atkins employs over 18,000 staff based in more than 200 permanent offices worldwide. Projects have been undertaken in more than 150 countries. As of June 2009, Atkins generated an annual turnover in excess of £1.5 billion.

Atkins is the UK's largest engineering consultancy, the largest multidisciplinary consultancy in Europe, the 4th largest multidisciplinary consultancy in the world, and the largest UK engineering consultancy in the Middle East. Our size brings significant value to our clients, allowing us to harness an unrivalled pool of creative, professional people to produce outstanding solutions to challenging problems.

Quality delivery

Atkins implements a comprehensive range of fully certified and integrated quality, safety and environmental management systems that distinguish us from our competitors. This means we can guarantee unrivalled performance standards.

All of our Middle East & India operations are externally certified to all three internationally recognised QSE management systems:

BS EN ISO 9001:2000 –
Quality Management System

BS EN ISO 14001:2004 –
Environmental Management System

OHSAS 18001:2007 –
Occupational Health and Safety Assessment Series

We have a regional Business Quality Director to oversee the administration of the business management systems, including the implementation of a Quality Management System (QMS). Each office also has a Quality Manager.

We are able to integrate quality procedures into all the projects that we deliver on behalf of government ministries, local governments, hotel and leisure project operators, major real estate developers, national oil companies, contractors in the oil and gas sector and private clients.

Airports in the region

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Atkins is one of the world's leading providers of technical and commercial consultancy services.

We pride ourselves on the delivery of first class solutions, tailored to the specific requirements of our discerning clients, from our continually expanding team of highly skilled personnel across a wide range of professional skills including specialist airport and associated airport systems design.

Combining innovation with consistently high technical standards, we draw on our world-wide market leading expertise to add value both in the delivery and the investment potential of the projects we design.

We offer specialist airport design and systems expertise to various aspects of aviation engineering.

Our solutions employ concepts that challenge ordinary thought; ensuring facilities meet the exact requirements for supporting the needs of the business.

Our aviation clients range from: ministries, airport authorities, local governments, hotel and leisure project operators, major real estate developers, military and private clients.

Regardless of project size and complexity, our aim is to provide a fully integrated solution that is innovative yet proven in its approach to emerging technologies and threats.

Amongst others, our regional major projects are:

- Seeb Airport, Muscat, baggage handling system designs
- Dubai Airport, UAE, A380 hangar design
- Das Island, Abu Dhabi, terminal concept designs
- Etihad Village, Abu Dhabi, airline staff complex design
- Trivandrum Airport, India, environmental studies
- New Doha International Airport, runway design
- Al Yamamah Military Airbase, KSA, infrastructure planning

Airport services

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Atkins has a long and established history in the design and delivery of airport projects.

As one of the largest independent suppliers of aviation expertise, Atkins has undertaken numerous assignments, large and small, on behalf of clients throughout the world. These assignments have involved us in many of the major developments affecting air transport, such as: de-regulation, privatisation, security and the latest advances in design engineering.

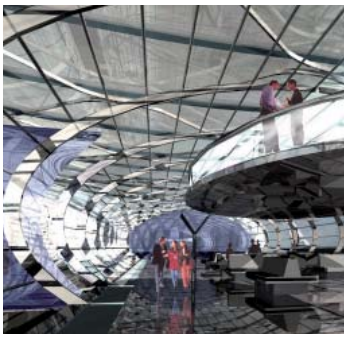
The balance between environmental sustainability and social economic sustainability is a delicate one that is facing the airline industry and airport operators alike. The current challenges of fluctuating fuel prices, global recession and climate change add to the business complexity. The need to continually engage with stakeholders and local communities has never been so important.

We employ innovative approaches that can deliver even the most complex multidisciplinary programmes. Our experience, global reach and the depth of our resources means we add value at every stage of a project lifecycle.

Our goal is to facilitate a successful business for our clients whilst maintaining customer confidence in safety and the convenience of air travel.







Our services to airlines and airports which can be supported from the Middle East can be summarised as:

- Airport facilities
- Passenger terminals
- Cargo terminals and cargo systems
- Air traffic control systems
- Baggage handling
- Masterplanning
- Hangars and MRO facilities
- Runway and pavement design and refurbishment
- Infrastructure, integrated transport access
- Project management, supervision, maintenance
- ICT, control systems and integration
- Security
- Environment and geotechnical studies
- Airport, economic and operations studies and support services

Airport facilities

Delivery of state-of-the-art facilities is essential to ensure effective operations. Our teams are delivery focused. We are totally independent and offer extensive capability and flexibility to our clients. We pride ourselves on being responsive to changing client criteria and apply technical excellence in everything we do.

The effective planning of airport facilities and integration into the airport masterplan requires a high level of understanding of airport operations, safety considerations and the constraints imposed by these. The planning of facilities should not be undertaken in isolation if these facilities are to operate their separate functions at the highest possible levels of efficiency.

Good planning will optimise the use of facilities and will allow expansion to accommodate future air traffic demands, ensuring that safety and security issues are given the highest priority. Liaison with statutory and control authorities is essential in this respect.

Atkins has experience in the planning, design and implementation of most of the major facility components that make up an airport. These include:

- Passenger terminals
- Cargo terminals
- Hangars and maintenance facilities
- Operations buildings
- Administration buildings
- Air traffic control towers
- Security facilities
- Runways and taxiways
- Aprons
- Transit systems
- Carpark facilities
- Utility services
- Roads
- Surface access

Project examples

Das Island, Abu Dhabi

Etihad Village, Abu Dhabi

Al Yamamah, KSA

LHR World Cargo Centre, UK

Passenger terminals

As the focal point of any airport, the airport passenger terminal must be designed to accommodate a diverse array of requirements from differing users. A good terminal design takes account of the various flows of passengers and baggage and serves at least three distinct user groups:

- Passengers
- Airlines
- Airport, terminal management and operations

In simple terms, an airport passenger terminal is a transport system interchange. However, the design of an inter-modal transport system can be far from simple.

Airport Passenger Terminal planning and design involves the use of forecasting, data analysis, strategic business and operations planning to develop the terminal requirements.

This process requires the co-ordination of a wide range of issues that will affect the operational requirements of the terminal building. These range from airspace capacity, air traffic control procedures, typical aircraft mix, runway, taxiway and apron capacity, land access and transport modal share, population catchment area and customer service expectations.

Atkins has the skill and experience to translate these planning issues into an airport passenger terminal design that satisfies all its users' requirements.

It is a complex and demanding task to ensure that the subsequent design offers passengers a managed journey that is well integrated with other transport modes, as well as providing airport operators and airlines a facility that is safe, secure and comfortable for both passenger and staff.

A careful and considered approach to planning issues combined with creating a facility that can cater for the immediate needs of the airport, whilst allowing for expansion in line with forecast demand, is a major challenge.

Atkins is involved in all aspects of terminal design, and has achieved a comprehensive record in the planning of airport facilities, both large and small, around the world.

Project examples

Urumchi Diwopu Airport

Xi'an Xianyang International Airport, planning and terminal design

Urumchi Diwopu Airport, China

Cargo terminals and cargo systems

A cargo handling system forms a crucial part of a wider logistics chain, moving goods from a starting location to a delivery destination. An effective system must take into account the number of sources and destinations, delivery speeds, anticipated throughputs and delivery guarantees.

The logistics system's toolkit contains a vast array of IT and mechanical equipment, trucks and tracks to move goods. Accurate item identification using laser bar code readers, radio tags and optical character recognition systems are essential components. The level of automation must be carefully balanced: with too little the costs and unreliability of manual labour make the business uncompetitive; with too much the system may take an unacceptably long period to bring into service.

Atkins has extensive skills and experience in the air cargo industry. This gives us the capability to design and construct air cargo facilities that comprehensively meet the demands of our clients. This capability includes:

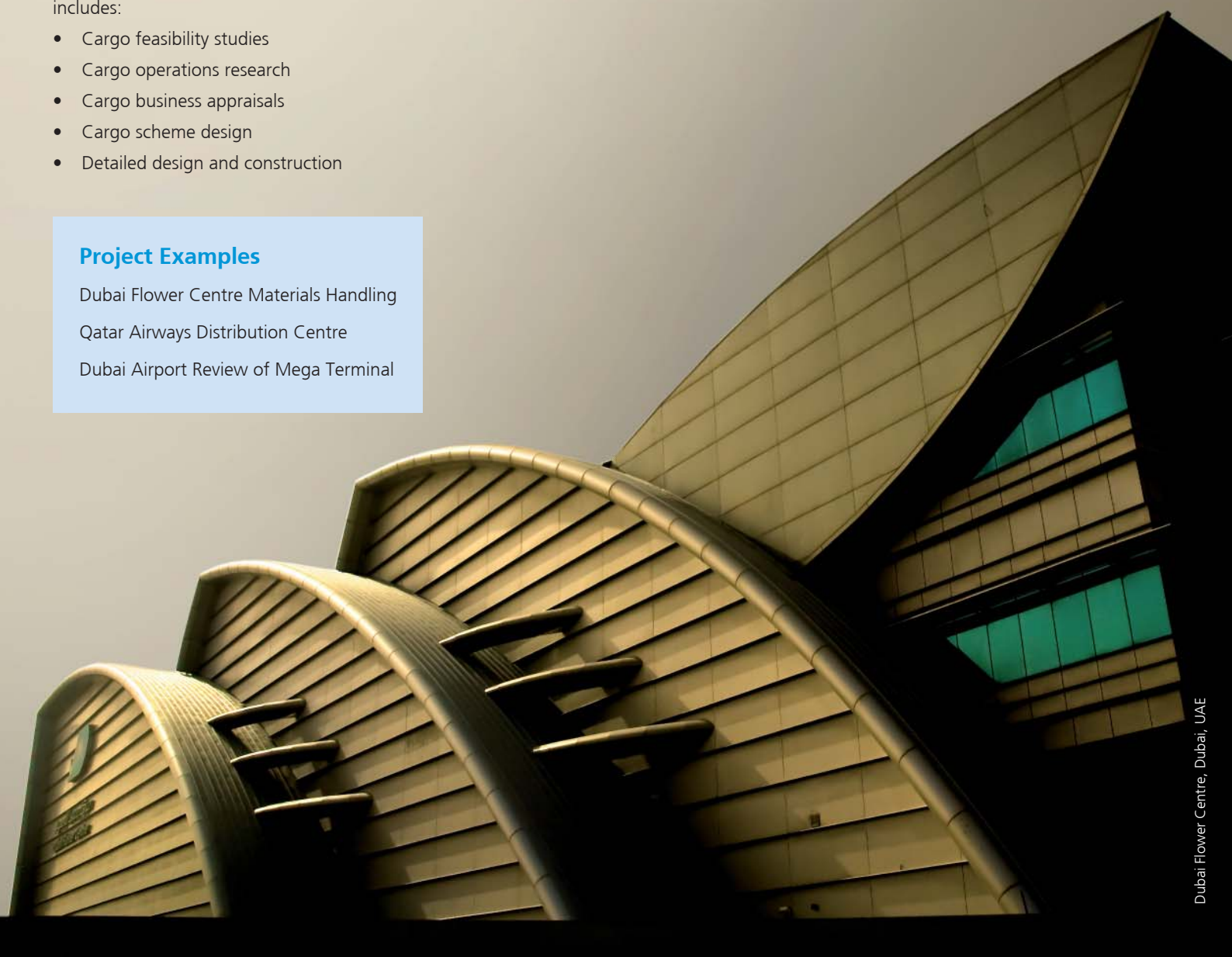
- Cargo feasibility studies
- Cargo operations research
- Cargo business appraisals
- Cargo scheme design
- Detailed design and construction

Project Examples

Dubai Flower Centre Materials Handling

Qatar Airways Distribution Centre

Dubai Airport Review of Mega Terminal



Dubai Flower Centre, Dubai, UAE

Runway and pavement design and refurbishment

Chek Lap Kok Airport, China

The safe, efficient and cost-effective movement of aircraft at airports is critical to their successful operation. Runways, taxiways and aprons take a large part of an airport's budget, either in the construction of new pavements or the refurbishment and/or upgrade of existing pavements.

The design and construction of an economical and durable pavement system requires an understanding of a variety of factors in determining the type and optimum thickness of layers. Various design methods are available for the analysis of pavement structure, and the interpretation of results demands a high level of engineering knowledge and experience.

Atkins has extensive background in airfield pavement design. We have been involved in some of the world's most prestigious airport projects, including the design of all of the runways, taxiways and aprons for Hong Kong's Chek Lap Kok Airport and Manchester Airport's second runway, the first new runway to be built in the UK for 20 years.

Project Examples

New Doha International Airport, runway and pavement designs

Chek Lap Kok T1 and T2 pavement designs

Surface access

Good surface access is vital to the efficient operation of modern airports. Without appropriate and adequate surface access routes for passengers, staff and goods the efficient operation of an airport is impossible. Indeed as the demand for air transport increases, activities associated with airports will continue to grow rapidly and surface access must be integrated into local, regional and national transport strategies.

The development and implementation of a successful surface access strategy requires a full and in-depth understanding by the airport owner of customers' current and future requirements in order to develop and meet the varied transport requirements. A good surface access strategy will also help reduce the environmental impact of an airport.

Atkins has extensive experience in the development of airport surface access strategies, and can provide solutions from conceptual planning through to commissioning and beyond.

Experience ranges from an assessment of rail-based park and ride schemes for Heathrow Airport, access planning for Stansted Airport from the M11, and justification for the T5 Public Inquiry of the road scheme associated with Terminal 5 and the expanded Heathrow Airport.

Baggage handling

Atkins provides consultancy services to ensure the delivery of advanced baggage handling systems for some of the world's major airports.

Baggage handling is one of the key challenges in airport terminal design and operations. Today's airports and airlines must ensure that investments in baggage systems will provide exceptional value and that their businesses will be significantly enhanced as a result. For baggage handling, this requires systems that can deliver the highest levels of customer service and operational performance at ever reducing cost.

Operationally these systems need to be highly flexible, reliable, maintainable and safe, whilst at the same time giving value for money and reducing lifecycle costs.

However, the performance of control systems has always undermined the ability of baggage systems to deliver the intended level of service to users.

From our wide range experience - from Heathrow to Chek Lap Kok - Atkins knows that it is vitally important for airports and airlines to be sure that baggage handling systems can be designed, built and commissioned both quickly and efficiently. More importantly, we know that it is essential from day one that the final system is an integral part of the business, and that it achieves the operational performance and reliability required.

Our services include:

- Concept and feasibility studies
- Scheme design
- Tender specification and appraisal
- Overall system design performance
- Control systems schemes
- Availability, reliability and maintainability analysis
- Process simulation analysis
- Communications and systems interfaces
- Interface requirements
- Requirements tracking
- Compliance matrix
- Management information systems

Atkins introduced the first integrated logistics baggage handling system at Heathrow Airport with its work on the Terminal 1 replacement system. Atkins approach to the design, development of performance specification and the project management implementation of these systems has been adopted throughout Heathrow and Gatwick, and in particular with 100% of Hold Baggage Screening System now considered standard throughout the industry.

Project examples

Seeb International Airport, Oman

Chek Lap Kok Baggage, China

Heathrow T1 and T2 baggage handling, UK

Masterplanning

Planning and forecasting are essential to the strategic development of any airport. The forecast establishes the need and potential of the airport, recognising economic and social requirements of the environs and worldwide considerations of the aviation industry. Forecasts consider both the short-term and long-term development periods and are refined as the development progresses and potential users are identified.

The masterplan defines the form and structure required to meet the forecast. This can either be a new development, an extension or enhancement of an existing airport. The masterplan can also develop a land use plan for agreement with those controlling the strategic planning of the area.

The masterplan will present a coordinated approach to infrastructure development that will ensure that key investment decisions will optimise developments.

Issues to be considered include:

- Air traffic demand forecasts
- Airport layout design
- Local / regional development plans
- Financial planning
- Socio-economic impacts
- Environmental impacts

Additionally, the masterplan is a tool that can help identify potential future problems and opportunities, provide guidance on policy decisions, assist in securing financial assistance, generate local community interest and support, and serve as a basis for negotiations between the airport and its users.

Bahrain Airport, Bahrain

Project examples

Bahrain Airport

Trivandrum Airport, India

Ajman Airport, UAE

Air traffic control centres

Atkins has a number of expert staff able to capture the specific requirements of aeronautical radio users such as Air Traffic Control Towers or en-route centres and to translate those requirements into meaningful system designs or improvements.

Both groups of ATC are liable to have a considerable number of VHF and UHF frequencies allocated to their use within the aeronautical sub-bands.

By employing high-specification RF cavities, we ensure no de-sensing of closely co-located radio receivers occurs when several of the allocated radio frequencies are in use at the same site simultaneously.

Coverage predictions studies have been undertaken at VHF and UHF aeronautical communications frequencies for overseas clients and were based on:

- A thorough understanding of the propagation
- Characteristics applicable
- The proposed antenna characteristics
- A number of differing heights above ground
- Transmitter output power
- Local meteorological conditions

Atkins understands the problems associated with fixed channel allocation and frequency re-use based on geographical separation and fully understand the 8.33 kHz concepts and the improved spectrum management resulting.

We also have the capability to undertake radio frequency inter-modulation studies across an entire site and can assist clients to avoid self-inflicted interference.

In addition, we have the expertise to ensure that the final design is correctly interpreted by the contractor(s) appointed to carry out the work and that the work is conducted in a timely and professional manner, to a standard acceptable by the client and the end-users.

Our expertise in this respect includes managing the:

- Overall programme of work
- Method statements
- Working facilities
- Working procedures
- Installation and commissioning documents

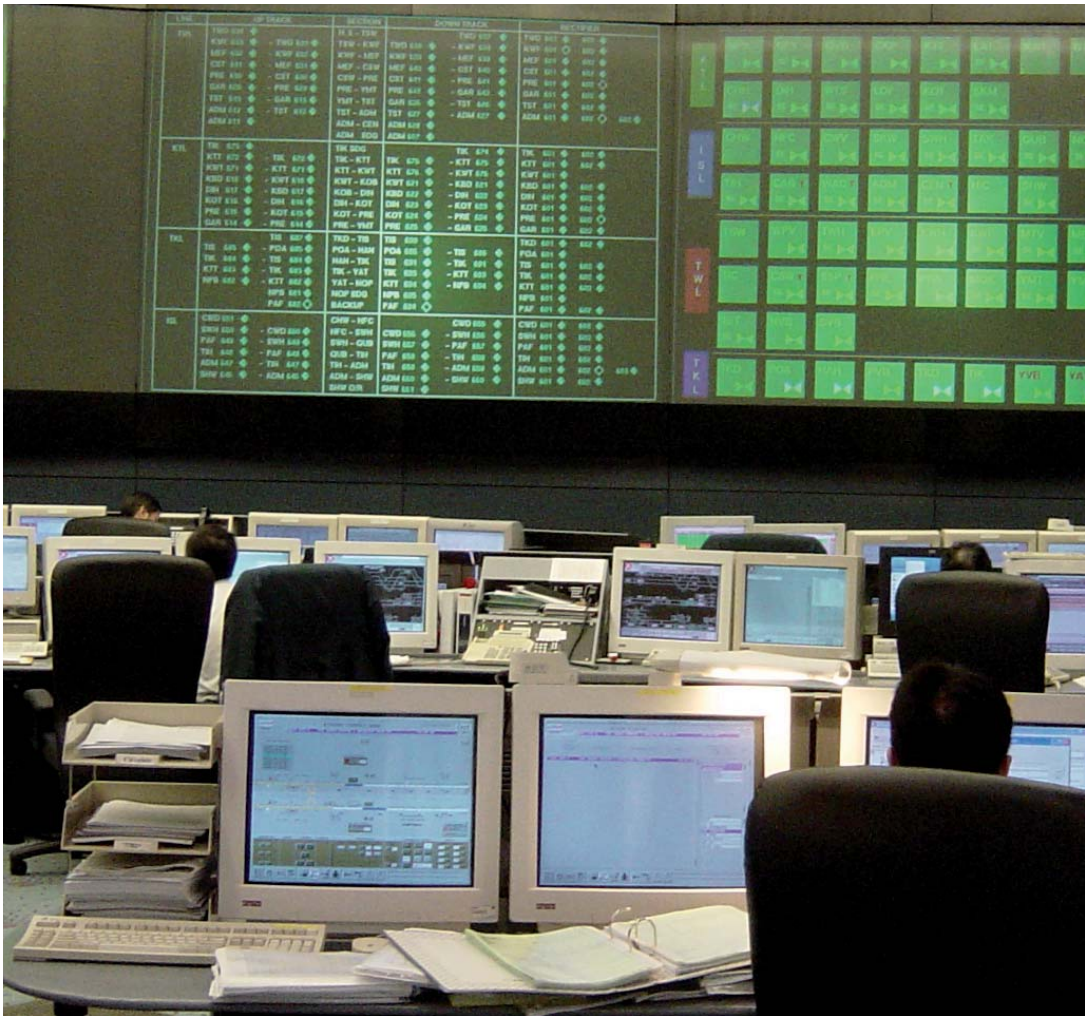
Project examples

West London Air Traffic Control Centre, UK

Stansted Airport ATC Procurement, UK

Chek Lap Kok, China

Airport IT and control systems



Our airport systems integration experience includes:

- Baggage handling interface
- Management information
- Network management
- Airport wide CCTV coverage
- Airport operational databases
- Flight information systems
- Security and access control systems
- Public address systems
- Fire alarms and zone alarm systems
- Access control
- Building management and SCADA systems

Our services for airport systems include:

- Specification and design
- Planning
- Tender preparation and selection
- Contractor supervision
- Commissioning
- Acceptance testing
- Trials coordination

An airport's operations management must have full monitoring, command and control capability for the multitude of systems and equipment required from normal operations to full-scale incident management.

The IT data provided by systems can be analysed to ensure that investments are made in the correct areas to sustain and develop the airport. Other information can alert operators to when essential maintenance is required and thus prevent breakdowns occurring at sensitive times.

Atkins has an in-depth understanding of airport IT systems and our engineers are skilled at resolving IT design and interface issues from specification to realisation of the most advanced control and communication IT systems.

Our work at Heathrow, Gatwick, Dublin, Manchester and Chek Lap Kok airports with respect to the integration of the business and operational systems makes Atkins leaders in the delivery of vital information technology of operational systems.

Project examples

Sheremetyevo Airport, Russia

Gatwick Airport, UK

Telecommunications

Excellent telecommunications are essential to the control, operation and running of an airport. The ability to receive and acquire data from a large range of sources as daily operations progress and pass on relevant information to staff and passengers ensures a safe and efficiently run airport.

We understand the numerous interfaces between technical, managerial and operations teams at airports. Our engineers can enhance and integrate systems and resolve telecommunication problems.

Atkins has been involved with the planning, design, installation, testing and commissioning of the latest and most advanced systems used to control and communicate in airports.

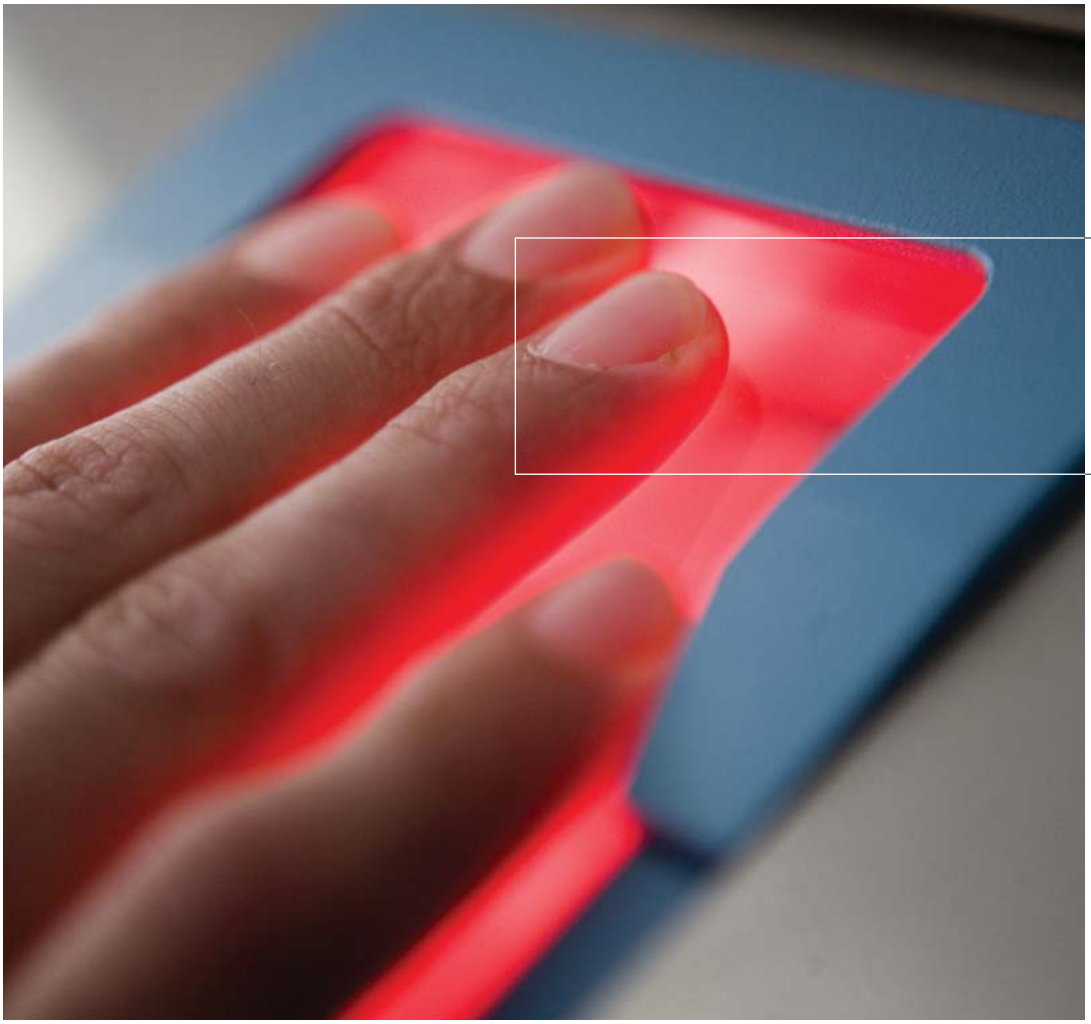
Our airport telecommunications experience includes:

- Strategic studies: technical and financial feasibility
- System design - conceptual; demand and network planning
- Specification - systems and equipment specification
- Procurement - tender invitation and evaluation; contract preparation and negotiation
- Implementation - project management; supply, installation, commissioning; Quality Assurance
- Commissioning - test scenarios; acceptance testing
- Operation - organisation and procedures; maintenance
- Training

Our airport systems integration experience includes:

- Integrated cabling and fibre optic networks
- Public address
- Telephones (PABX)
- Trunked mobile radio
- General building management airfield SCADA
- Airport wide CCTV
- Access control
- Flight information display
- Airport operational database
- Network management
- Management information capability

Security



Atkins delivered a biometric identification system for Heathrow Airport's Terminal 5.

Atkins operational system security capability is currently servicing the needs of the defence, government, aviation, utility companies and transport industries on projects across the complete lifecycle.

We identify business threats, risks to data confidentiality and facility integrity. This ranges from business security studies and contingency planning into access control for assets and data e.g. SCADA systems.

Our detailed security infrastructure services include issues of computer security, public access and data protection; access control systems, hard and key point design.

Our solutions satisfy appropriate standards and practices such as BS7799, the Manual of Protective security, CESG Memoranda and JSP440 for the UK Ministry of Defence services.

The rapid growth of e-business requires that all organisations have comprehensive security policies to address all aspects of the business, ranging from staff access to on-line sales and commerce. We take full account of current and proposed legislation such as the Data Protection Act, Computer Misuse Act and the Human Rights Bill.

Our holistic approach to security is tailored to cover:

- Complete security requirement analysis, design and implementation
- Audit of practices and countermeasures
- Identification of risks and avoidance or mitigation
- Software security and data penetration

As one of the largest independent suppliers of aviation expertise, Atkins has undertaken numerous assignments on behalf of its clients throughout the world.

Our assignments have involved many major developments affecting air transport, such as deregulation, privatisation, security and the latest advances in design engineering.

Our expertise covers the following specialist areas:

- Security threat assessment, analysis
- Response measures
- Access control
- Control systems and centres
- Protective barriers and physical infrastructure
- CCTV, security lighting, communications
- PA Systems
- Security sensors, intruder detection and alarms
- Baggage and passenger screening systems
- Information and systems survey and security
- Terrorist risks to the built environment
- Personnel safety provisions and training

Airport support services

Operational readiness

Operational readiness is vital for airports if they are to maintain regular air traffic movements in a safe, efficient and time-critical manner. Support services such as emergency response teams, air traffic control and ground support equipment must be available at all times if airports are to avoid the risk of disrupting operations and compromising safety.

As a result, the component parts of an operational airport must be designed, operated and maintained with this critical role in mind. Atkins has a long and experienced track record in helping clients with the planning and design of the facilities needed to meet operational, as well as business requirements at airports.

In particular we have experience in the design and implementation of the following airport support services:

- Rescue and fire fighting
- Air Traffic Control tower
- Navigational aid installations
- AGL
- Aircraft fuel storage and distribution
- Hangars and maintenance facilities
- Engine test cells
- Ground support equipment facilities
- Catering facilities
- Utility infrastructure

Facilities Management

Providing consultancy and support services for property assets, Atkins' multidisciplinary Facilities Management (FM) capability helps clients minimise whole-life property, maintenance costs and maximise asset values.

Atkins offer the following FM services:

- Asset management
- Condition surveys of structures, facilities and terminals
- Maintenance management (planned and reactive)
- PPM IT systems and support
- Helpdesks
- Purchase order management
- Spares and inventory management
- Management information systems
- Capital works programmes
- Refurbishment programmes
- Estate management
- Lifecycle costing

Project example

At Manchester Airport we provide a comprehensive range of FM services covering terminals and aprons. In conjunction with this we are able to integrate our design services to support the various minor modifications and changes that are needed to keep the airports' passenger handling operations responsive and flexible to a rapidly changing operational environment.

Analysis and studies >

Operations analysis

The efficient and profitable operation of an airport relies upon the successful integration of a huge number of independent processes, both airside and landside. These processes often vary widely in function and nature, but must be integrated into the operation of the airport in order to deliver the required levels of service.

However, there are occasions when operational processes fail or are affected by new factors that were not previously anticipated. The timely identification and quantification of operational problems is therefore vital to the business of airports and airlines. Inaccurate analysis of operational issues can result in severe operational problems, high financial recovery costs and a delay in the introduction of practical and realistic solutions.

Working closely with our clients, we draw upon a wide range of commercial and technical expertise to achieve the most appropriate solutions.

Our areas of capability include:

- Air traffic control and airspace management
- Airport airside capacity
- Airport passenger terminal capacity
- Surface access (multi-modal)
- Car parking
- Cargo terminal capacity and processes
- Airside/terminal interface
- Ground handling operations
- Baggage handling
- Security and risk assessment
- Crash, fire and rescue
- Integrated IT systems
- Facilities management
- Aircraft manoeuvring areas

Environmental impact studies

Atkins provides advice on all aspects of the environment that concern airports. Our capability covers all disciplines across the environmental media, water, air, solid waste, soil and noise. We can advise on legislation and regulations as they apply to airports.

Audits can be produced for airports including air and water quality measured. For noise, computer modelling is used to build a 3D virtual model noise map for all combinations of noise sources which for an airport could include aircraft, roads, railways and industrial processes.

Advice can also be given on waste management, a demanding process with larger aircraft. Environmental Impact Assessments (EIA) and Environmental Impact Statements (EIS) can be produced for airport development at concept and detailed stages of development.

Our capability includes:

- Assessments and audits
- Environmental Impact Statements
- Noise prediction and measurement
- Aircraft and ground vehicle emissions
- Noise and pollution monitoring
- Heritage impact
- Sites of special scientific interest

Economic studies

Within the modern aviation industry, financial and economic factors are of primary concern to all businesses. The success or failure of a project, or company, can hinge upon the proper management of these issues. In today's dynamic climate, airports and airlines must ensure that their investment plans will provide exceptional value and that their business will be significantly enhanced as a result.

Atkins assists firms in the assessment of funding options, the structure of financing, or the appraisal of BOOT, BOT and PFI schemes. Furthermore, Atkins has developed its own software tool, ATPLAN, for the financial modelling of business parameters.

As a major investor, service provider and consultant to Public Finance Initiative (PFI) schemes, Atkins is involved with some of the largest PFI schemes undertaken to date. With our experience of the Channel Tunnel and our involvement with roads, railways, hospitals and schools, Atkins has assessed the funding options, structure of financing, BOT, BOOT and PFI schemes, financial modelling and privatisation of schemes for a wide range of clients.

Geotechnical and topographic surveys

Geotechnical and topographic data is essential to the planning of aviation infrastructure development. The topography of an airport can restrict the long-term potential of the site, or with careful planning, any changes of levels can enhance a development. Aviation regulations stipulate the limitations on the airside heights and slopes that allow aircraft to operate, both on the immediate airfield and for specific distances on the approaches to the runway. These must be considered for the development of any airfield site, and good mapping is a pre-requisite to early planning.

Similarly, the nature of the soil and any geological conditions must be understood as the cost of aircraft pavement is directly affected by the quality of the ground.

Should any airfield be considered for expansion, the condition and size of the existing infrastructure is necessary to ensure that correct financial decisions are made.

Atkins has a wide range of expertise encompassing geotechnical and other survey tasks including:

- Topographical and level surveys
- Digital mapping and precise measurements
- Cut and fill site balances
- Soil mechanics and geological investigations
- Hydrographical surveys

Project example

Our experience has included the prediction of the settlement that will take place over time of the platform created for the new Hong Kong Airport at Chek Lap Kok. This platform covers some 1,248 hectares of which 75 per cent is reclaimed from the sea.

Using a computer model, developed in-house, an analysis of the various depths of different layers of fill deposited on the seabed was produced and the combined settlement predicted. The project used some 198 million cubic metres of fill material that was excavated from the islands of Chek Lap Kok and Lam Chau.

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