



INFORMATION BULLETIN 12/2012

SUBJECT	:	PUBLICATION OF UAE ATM STRATEGIC PLAN 2012 - 2030
ORIGINATOR	:	AIR NAVIGATION AND AERODROMES DEPARTMENT
STATUS	:	INFORMATORY
ADDRESSED TO	:	ALL AIRSPACE USERS, INTERESTED PARTIES AND STAKEHOLDERS
DATE	:	MONDAY, 05 NOVEMBER 2012

1. **PURPOSE**

The objective of this Information Bulletin is to advise all UAE Airspace stakeholders of the publication for comment of the UAE Air Traffic Management Strategic Plan 2012 – 2030.

2. **APPLICABILITY**

The information bulletin is applicable to UAE Operators, Users of UAE Airspace, Emirate Civil Aviation Authorities, ANSPs and Aerodromes.

3. **CANCELLATION**

This is the first issue of this information bulletin and will be cancelled on 01 January 2013.

4. **SUMMARY OF THE UAE ATM STRATEGIC PLAN**

The UAE ATM Strategic Plan was developed by the National Airspace Advisory Committee (NASAC) in order to provide guidance to ATM users in planning for future ATM developments. The UAE Air Traffic Management Strategic Plan 2012 – 2030 aims to provide leadership and direction to the ATM community on the future capabilities and technologies required to deliver an ATM system that:

- is responsive to airspace users,
- is capable of ensuring a safe, economic and efficient system that accommodates demand,
- is globally interoperable environmentally sustainable, and
- Satisfies national interests including defense and security.

The UAE Air Traffic Management Strategic Plan 2012 – 2030 establishes the vision for ATM in the UAE in the period to 2030. In recognition of the potential for significant changes in operating capabilities and technologies over such a period, the plan must necessarily be high level, with the strategies identified being robust enough to 'stand the test of time', and maintain a strategic, rather than tactical direction that can be followed throughout the planning period.



5. REQUIREMENTS

The GCAA seeks comment from the above interested parties on the content, timelines and issues related to the implementation of the UAE Air Traffic Management Strategic Plan 2012 – 2030. The UAE Air Traffic Management Strategic Plan 2012 – 2030 will be available for comment until 31 December 2012

All queries related to above subject shall be forwarded to the ANA Department by email: ana@gcaa.gov.ae .

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DRAFT

UAE ATM Strategic Plan

2012 - 2030

1 Foreword

Air traffic management is defined by ICAO as the dynamic, integrated management of air traffic and airspace — safely, economically and efficiently — through the provision of facilities and seamless services in collaboration with all parties. For many years the term air traffic management (ATM) has been used by various bodies to mean different things, and is sometimes interpreted as a synonym for air traffic control or air traffic services. Recently, ICAO developed the definition above and published an operational concept, making it clear that ATM includes all traffic in any airspace, as well as the infrastructure, people, procedures and technology involved in aircraft operations. The definition also emphasizes the need for a collaborative approach to developing the ATM system. The primary functions of the ATM system will enable flight from/to an aerodrome into airspace, safely separated from hazards, within capacity limits, making optimum use of all system resources. ATM stakeholders include all airspace users, airports, air navigation service providers, regulators, manufacturers and a variety of other interested parties.

The UAE Air Traffic Management Strategic Plan 2012 – 2030 aims to provide leadership and direction to the ATM community on the future capabilities and technologies required to deliver an ATM system that is responsive to airspace users, is capable of ensuring a safe, economic and efficient system that accommodates demand, is globally interoperable environmentally sustainable and satisfies national interests including defense and security. The UAE Air Traffic Management Strategic Plan 2012 – 2030 establishes the vision for ATM in the UAE in the period to 2030. In recognition of the potential for significant changes in operating capabilities and technologies over such a period, the plan must necessarily be high level, with the strategies identified being robust enough to ‘stand the test of time’, and maintain a strategic, rather than tactical direction that can be followed throughout the planning period.

A strategic plan is most effective when there is widespread agreement with, and commitment to, its objectives. The industry needs to work cohesively to deliver the desired outcomes.

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2 Executive Summary

The UAE Air Traffic Management Strategic Plan 2012 – 2030 is intended to support the evolution to a future Air Traffic Management (ATM) system in the United Arab Emirates that is performance-based, addresses ATM community expectations, is cost-efficient and globally harmonized.

Whereas the ICAO Global ATM Operational Concept is a statement of “*what*” is envisaged in terms of an interoperable global ATM system, the objective of the UAE ATM Strategic Plan is to detail “*how*” these initiatives will be enabled in accordance with UAE ATM community expectations and within the framework of ICAO MIDANPIRG regional planning.

The UAE ATM Strategic Plan has a planning horizon from 2012 to 2030, divided into Short Term Commitment Plans (2012 – 2015); Mid Term Objectives (2015 – 2020); and Long Term Aspirations (2020 – 2030).

The UAE ATM Strategic Plan will be reviewed every five years and the Short Term Commitment Plans will be updated on an annual basis to ensure synchronization with the MIDANPIRG planning cycle as well as maintaining relevance to national interest, government policy and individual stakeholder’s strategic objectives.

3 Introduction

The purpose of the UAE ATM Strategic Plan 2012 – 2030 is to articulate the strategies and performance objectives consistent with the expectations of the UAE ATM Community in accordance with the Global ATM Operational Concept and to detail Short Term Commitment Plans (“Action Plans”) which are aligned with MIDANPIRG regional plans for an evolving air navigation system.

The total number for flights will increase from 608,877 in 2010 to approximately 1,533,409 in 2030. The cumulative annual average growth rate is estimated to be 6.8% from 2010 to 2015, 4.8% from 2015 to 2020 and 3.7 % from 2020 to 2030 for total civilian operations in UAE airspace. The average number of daily flights will increase from 1,668 in 2010 to 4,201 in 2030. It should be noted that all forecasts used for this report are unconstrained forecasts and may change as required by facility constraints.

The total number of overflights will increase from 140,821 in 2010 to approximately 373,640 in 2030 at a cumulative annual average growth rate of 5.1 % throughout this timeframe.

The UAE Air Traffic Management Strategic Plan 2012 – 2030 facilitates the evolution to a future ATM system in the UAE that is performance-based, addresses ATM community expectations, is cost-efficient, environmentally sustainable and is globally harmonized. This ensures that the UAE continues to maintain an ATM system that can safely accommodate demand, is globally interoperable, environmentally sustainable and satisfies national interests, including defense and security.

4 The ATM Community

The global ATM Operational Concept defines the ATM Community as: “The aggregate of organizations, agencies or entities that may participate, collaborate and cooperate in the planning, development, use, regulation, operation and maintenance of the ATM system.”¹

Within the UAE, the ATM Community is comprised of, and not limited to, the following organizations:

- Abu Dhabi Airports Company
- Abu Dhabi Department of Transport
- Air Arabia Airlines
- Dubai Civil Aviation Authority
- Dubai Airports
- Dubai Air Navigation Services (DANS)
- Dubai Airwing
- Emirates Airline
- Etihad Airways
- flydubai
- Fujairah Department of Civil Aviation
- Presidential Flight
- Ras Al Khaimah Airport LLC
- Ras Al Khaimah Department of Civil Aviation
- RAK Airways
- Sharjah Department of Civil Aviation
- Sharjah Airport Authority
- UAE General Civil Aviation Authority
- UAE Military
- National Centre for Meteorology and Seismology
- GA fraternity consulted as necessary.

¹ ICAO Doc 9584 Global Air Traffic Management Operational Concept Appendix B

4.1 ATM Community Expectations

The ICAO ATM Global Operational Concept² lists a number of general, high level ATM Community expectations which are used in performance management as the framework for key performance areas (KPA). These ATM Community Expectations include the following:

1. Access and equity;
2. Capacity;
3. Cost effectiveness;
4. Efficiency;
5. Environment;
6. Flexibility;
7. Global interoperability;
8. Participation by the ATM community;
9. Predictability;
10. Safety; and
11. Security.

A key expectation of the Global ATM Operational Concept is that “The ATM community should continuously be involved in the planning, implementation, and operation of the system to ensure that the evolution of the global air navigation system meets the expectations of the community.”³

4.2 Collaborative Approach

Collaborative approach is an essential element of the operational concept. It enables all members of the ATM community, especially airspace users, to participate in the ATM decision making that affects them. The level of participation will reflect the level to which a decision will affect them.

² ICAO Doc 9854 ATM Global Operational Concept Appendix D 1 - 2

³ ICAO Doc 9584 Global Air Traffic Management Operational Concept Appendix D

Collaborative approach means achieving an acceptable solution that takes into account the needs of those involved. All participants will therefore require a spirit of cooperation. A balance is required because collaborative decision making is primarily invoked to resolve competing demands for an ATM resource and to organize a safe sharing of that resource among airspace users.⁴

4.3 The National Airspace Advisory Committee (NASAC)

The NASAC provides an industry-wide representation forum for developing the industry position on airspace matters as the basis for strategic advice to the GCAA, regarding the development and implementation of the GCAA approved integrated airspace plan.

A primary function of the NASAC is to recommend initiatives to provide a high quality service to airspace users and air navigation service providers through the safe, accurate and timely planning of the national airspace, utilising a performance based approach, measuring safety, capacity, cost effectiveness, efficiency and environmental impact.⁵

The UAE ATM Strategic Plan 2012 – 2030 has been developed in collaboration with the ATM Community through the UAE National Airspace Advisory Committee (NASAC).

5 Demand and Capacity Forecasting

“Developing a forecast is also a process to achieve a shared understanding of the future with ATM community members. This consensus is essential since it is the basis for identifying needs and agreeing on plans.

Not only should the forecast itself be developed in a collaborative manner, to enhance credibility of the forecast, but the forecasting approach and method also need to be collaborated between community members.

⁴⁴ ICAO Doc 9854 Global ATM Operational Concept Appendix I Para 10.3

⁵ NASAC Terms of Reference 17th May 2011

As part of the cooperation, it is important that ATM community members agree to use the same forecasting scenario as the basis for setting performance targets and estimating future performance.”⁶

Short Term (2015), Medium Term (2020) and Long Term (2030) Forecast

Table 1 shows the consolidated forecast for all airports. The total number for flights will increase from 608,877 in 2010 to approximately 1,533,409 in 2030. The cumulative annual average growth rate is estimated to be 6.8% from 2010 to 2015, 4.8% from 2015 to 2020 and 3.7 % from 2020 to 2030 for total civilian operations in UAE airspace. The average number of daily flights will increase from 1,668 in 2010 to 4,201 in 2030. It should be noted that all forecasts used for this report are unconstrained forecasts and may change as required by facility constraints.

The total number of overflights will increase from 140,821 in 2010 to approximately 373,640 in 2030 at a cumulative annual average growth rate of 5 % throughout this timeframe.

Abu Dhabi International Airport

The forecast increase in operations at Abu Dhabi Airport is attributed to growth of Etihad Airways and economic and tourism development of Emirate of Abu Dhabi. It is expected that annual operations at the airport will grow to 156,800 in 2015 (7.0% from 2010-2015), 200,000 in 2020 (5% from 2015-2020) and 272,000 in 2030 (3.1% from 2020-2030). The forecast numbers were obtained from Abu Dhabi International Airport Master Plan.

⁶ ICAO Doc 9883 Manual on Global Performance of the Air Navigation System Part 2 Para 2.2.5.6

Al Bateen Executive Airport

The forecast increase in operations at Al Bateen Executive Airport is attributed to growth of executive business jet operations and economic development of Emirate of Abu Dhabi. It is expected that annual operations at the airport will grow to 27,498 in 2015 (3.0% from 2010-2015), 35,983 in 2020 (5.5% from 2015-2020) and 54,501 in 2030 (4.2% from 2020-2030). The forecast numbers were obtained from Draft Al Bateen Executive Airport Master Plan.

Al Ain International Airport

The forecast increase in operations at Al Ain Airport is attributed to growth of military and civilian training flights and development of aerospace cluster at Al Ain Airport. It is expected that annual operations at the airport will grow to 83,000 in 2015 (4.0% from 2010-2015), 105,000 in 2020 (4.8% from 2015-2020) and 163,481 in 2030 (4.5% from 2020-2030). The forecast numbers were obtained from Al Ain International Airport Master Plan.

Sir Baniyas and Delma Island Airport

The forecast increase in operations at Sir Baniyas and Delma Airports is attributed to growth in tourism to desert islands in the western region. It is expected that annual operations at the two airports will grow to 7,960 in 2015 (26.5% from 2010-2015), 9,622 in 2020 (3.9% from 2015-2020) and 10,006 in 2030 (0.4% from 2020-2030). The forecast numbers were obtained from Draft Sir Baniyas and Delma Airport Master Plan.

Dubai International Airport/Dubai World Central

The forecast increase in operations at Dubai Airport and Dubai World Central Airport is attributed to growth of Emirates Airlines and economic and tourism development of Emirate of Dubai. It is expected that combined annual operations at the two airports excluding military and helicopters will grow to 447,364 in 2015 (8.6% from 2010 to 2015), 562,867 in 2020 (4.7% from 2015-2020) and 806,967 in 2030 (3.7% from 2020-2030). The unconstrained forecast numbers were obtained from forecast prepared by Dubai Airports. The exact timeline of the split between the two airports is currently not available.

Sharjah International Airport

The forecast increase in operations at Sharjah Airport is attributed to growth of Air Arabia. It is expected that annual operations at the airport will grow to 82,125 in 2015 (2.9% from 2010-2015), 109,500 in 2020 (5.9% from 2015-2020) and 164,250 in 2030 (4.1% from 2020-2030). The forecast numbers were generated based on aircraft acquisition plan for Air Arabia and projected number of sectors per aircraft per day provided by Air Arabia.

Fujairah International Airport

The average growth in operations at Fujairah Airport was calculated by reviewing historical data and projecting it forward. It is expected that annual operations at the airport will grow to 22,365 in 2015, 23,506 in 2020 and 25,966 in 2030 (1.0% from 2010-2030).

Ras Al Khaimah International Airport

The average growth in operations at Al Khaimah Airport was provided by the airport authority. It is expected that annual operations at the airport will grow to 17,431 in 2015, 22,247 in 2020 and 36,238 in 2030 (5.0% from 2010-2030).

Over Flights

The forecast increase in over flights for UAE FIR is attributed to growth in regional airports. It is expected that annual over flights will grow at an annual 5.1% rate to 179,727 in 2015, 229,382 in 2020 and 373,640 in 2030.

Table 1 – UAE Airports Forecast

Airport	2010		2015		2020		2030	
	Total	Avg/Day	Total	Avg/Day	Total	Avg/Day	Total	Avg/Day
Abu Dhabi Airport	112,010	307	156,800	430	200,000	548	272,000	745
Al Bateen Executive Airport	23,707	65	27,498	75	35,983	99	54,501	149
Al Ain International Airport	68,298	187	83,000	227	105,000	288	163,481	448
Sir Baniyas and Delma Airport	2,460	7	7,960	22	9,622	26	10,006	27
Dubai Airport and Dubai World Central	296,205	812	447,364	1,226	562,867	1,542	806,967	2,211
Sharjah Airport	71,259	195	82,125	225	109,500	300	164,250	450
Fujairah Airport	21,280	58	22,365	61	23,506	64	25,966	71
Ras Al Khaimah Airport	13,658	37	17,431	48	22,247	61	36,238	99
Total	608,877	1,668	844,543	2,314	1,068,725	2,928	1,533,409	4,201
Overflights	140,821	386	179,727	492	229,382	628	373,640	1,024

Sources:

1. Abu Dhabi International Airport, Al Ain International Airport, Al Bateen Executive Airport, Sir Baniyas and Delma Island Airport forecasts were provided by Abu Dhabi Airports Company.
2. Dubai Airport and Dubai World Central Airport forecasts were provided by Dubai Airports. The forecast numbers have not been separated between the two airports and doesn't include military and helicopter movements.
3. Sharjah International Airport, Ras Al Khaimah and Fujairah International Airport forecasts were prepared by the Forecast Workgroup based on data provided by the relevant airport authorities.
4. Overflights data was provided by GCAA Sheikh Zayed Center. Forecast Workgroup applied a 5% growth rate to calculate the future numbers.

Exhibit 1 – Forecast Annual Operations at UAE Airports

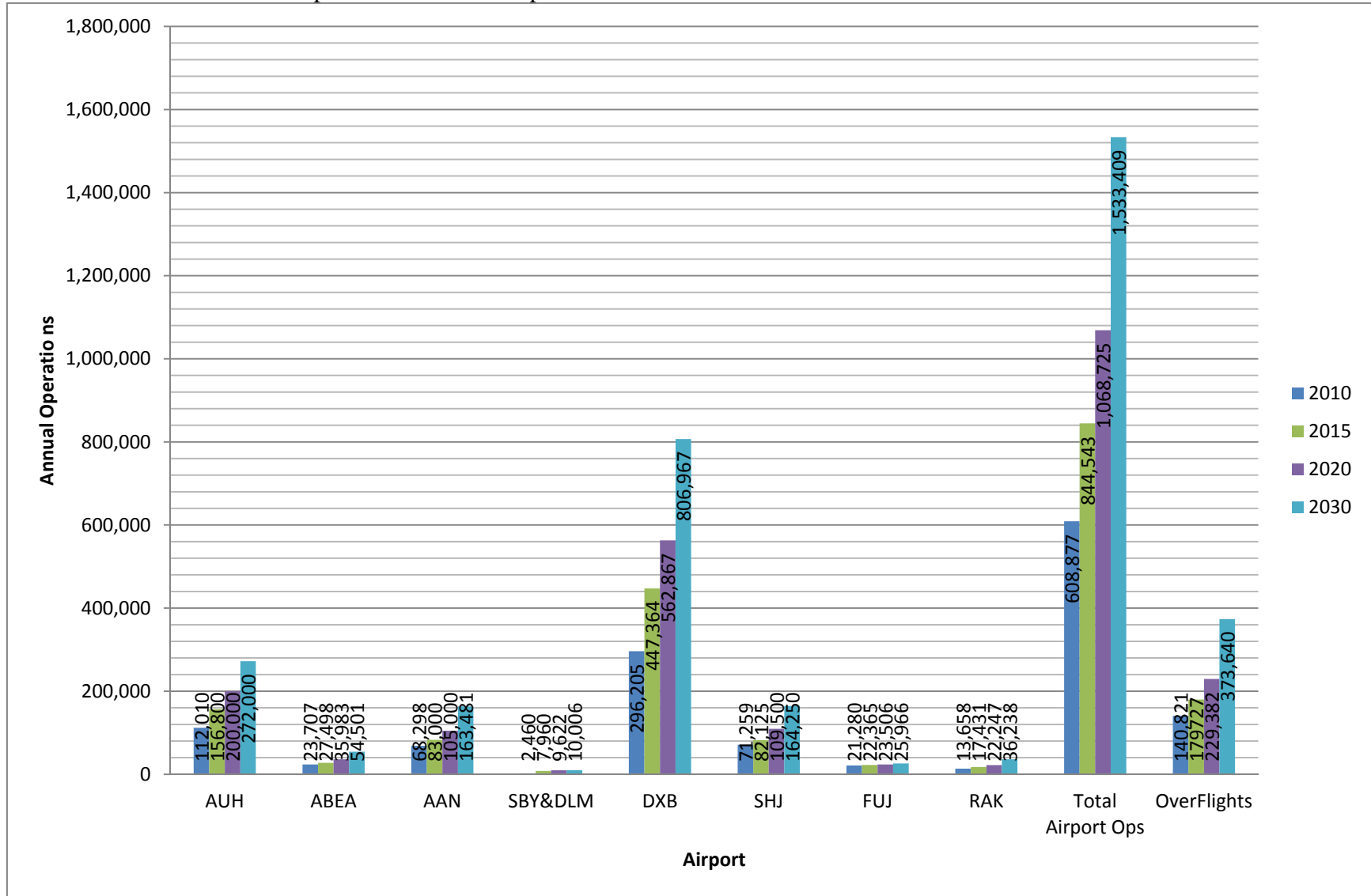
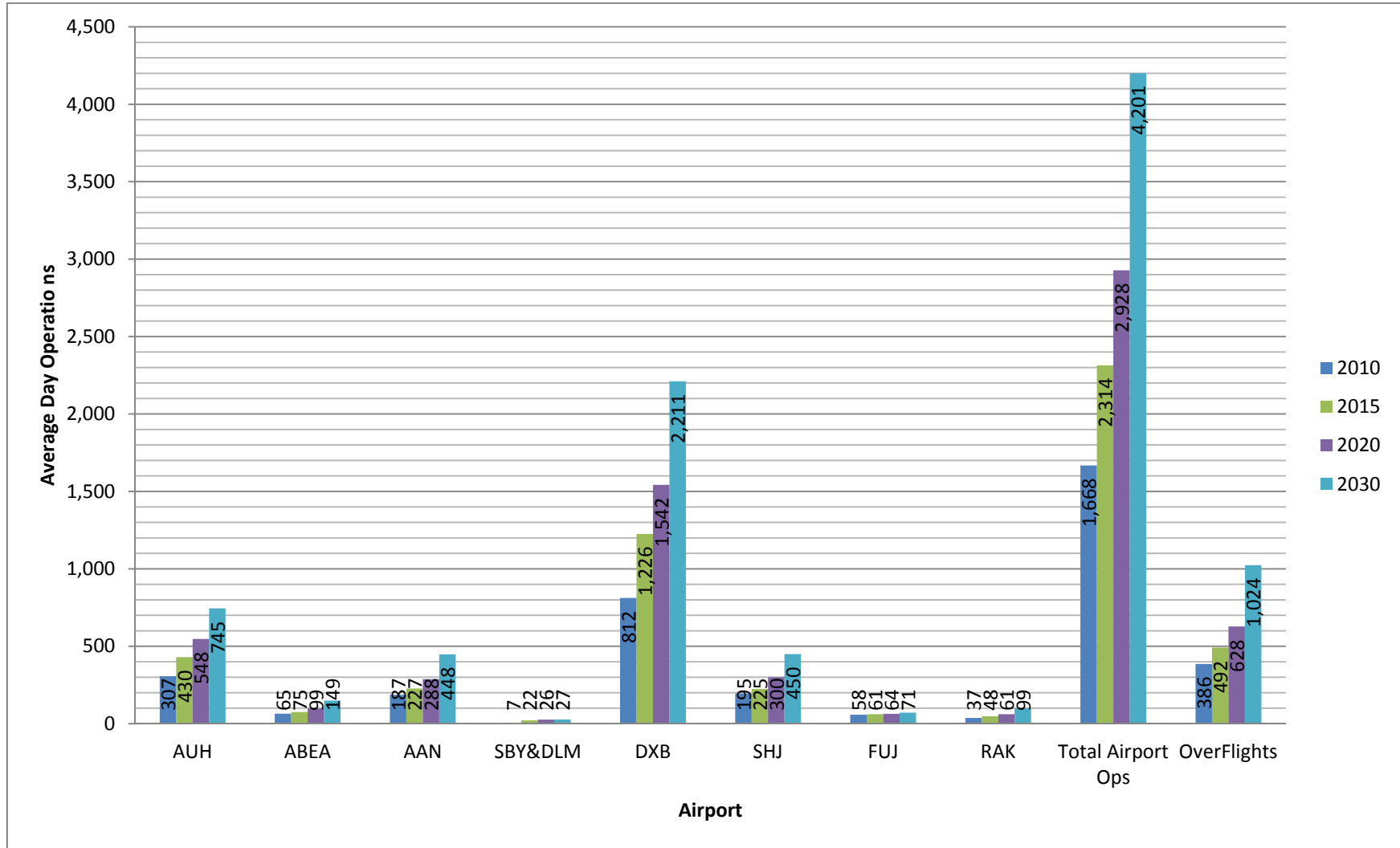


Exhibit 2 – Forecast Average Day Operations at UAE Airports



6 Key Performance Areas (KPA)

The purpose of the UAE Air Traffic Management Strategic Plan 2012 – 2030 is to set the direction and guidance required to address future challenges in terms of safety, capacity, efficiency and the environment. Key Performance Areas (KPAs) provide the main focus on the overall ATM Strategic planning process.

These are the eleven key performance areas (KPAs) identified in the Global Air Traffic Management Operational Concept (Doc 9854) and these are listed at paragraph 4.1 above.

These KPAs serve as the general framework for classifying performance needs and improvements. All planners are expected to use this standardized set of KPAs.

6.1 Global Plan Initiatives (GPIs)

The Global Plan Initiatives (GPIs) are designed to support the planning and implementation of performance objectives in the Regions, by providing a global strategic framework for planning air navigation systems to achieve regional/national performance objectives.

6.2 Concept Components

The Global ATM Operational Concept defines seven interdependent concept components that will be integrated to form the future ATM system. These Concept Components together with their unique identification are shown as follows:

- | | |
|-----------------------------------------|-----|
| 1. Airspace organization and management | AOM |
| 2. Demand and capacity balancing | DCB |
| 3. Aerodrome Operations | AO |
| 4. Traffic synchronization | TS |

- | | |
|------------------------------------|---------|
| 5. Conflict management | CM |
| 6. Airspace user operations | AUO |
| 7. ATM service delivery management | ATM SDM |

6.2.1 Airspace Organisation and Management

This concept establishes airspace structures to support the various stakeholders' requirements for access and level of service. The concept requires airspace to be considered a National asset, the management of which will be dynamic and flexible with any reservations being of a temporary nature allowing full access when that requirement no longer exists.

6.2.2 Demand and Capacity Balancing

This concept evaluates system wide traffic flows and capacities to allow airspace users to better determine their needs in a collaborative manner. This envisages collaboration at both strategic and tactical levels,

6.2.3 Aerodrome Operations

This concept requires that an aerodrome operator optimizes the ground infrastructure to improve safety and maximise capacity in all weather conditions for which the airport is required to operate through customer demand. Improvements in ground guidance, runway access/egress and traffic management will be required to meet this concept. (Detailed methodologies developed by EUROCONTROL in Airport Capacity Enhancement (ACE), Runway Safety, A-SMGCS and Airport CDM provide useful guidelines and may form a starting point).

6.2.4 Traffic Synchronization

This concept relates to the tactical management of traffic to provide conflict free trajectories, elimination of bottlenecks and optimization of traffic sequencing.

6.2.5 Conflict Management

This concept relates at the strategic level to airspace organization, capacity and demand balancing and at the tactical level, to traffic synchronisation, provision of separation and collision avoidance as the last level, with the target of limiting the risk of collision to an acceptable level.

6.2.6 Airspace User Operations

This concept refers to ATM aspects of flight operations including: accommodation of mixed capabilities, and a move towards a SWIM environment, with CDM being the first step towards SWIM.

6.2.7 ATM Service Delivery Management

This concept addresses the delivery of ATM services in a timely, cost effective, seamless and as required manner.

6.3 Performance Goals

The ATM community expectation embodied by each Key Performance Area (KPA) will be met by pursuing more specific performance goals. These are defined to assist the ATM community in producing relevant and timely enhancements (operational improvements) to the ATM system, in order to satisfy the ATM community expectations. Each performance goal should be mapped to the corresponding GPIs.

The goals in the Table below have been derived from an examination of global best practice in this area, integrating the specific expectations of the UAE ATM community. The goals below are set against each key performance area but, as is the case across the UAE Air Traffic Management Strategic Plan 2012 – 2030, they should not be considered in isolation rather as part of an integrated system. These are generic or ‘whole-of-system’ UAE goals. Each ATM community member may establish further internal performance objectives. The goals below are listed in alphabetical order but it is acknowledged that safety is of the highest priority.

KEY PERFORMANCE AREA	Goal
Access and Equity	1. To enable all airspace users fair and equitable access to all airspace, airports and required ATM services.
Capacity	<p>2. To provide sufficient capacity to meet the demand of all users in an effective and efficient manner at all times, and during typical busy hour periods without imposing significant operational, economic or environmental penalties under normal circumstances.</p> <p>3. To enable airports to make the best use of capacity, as determined by the infrastructure in place (land-side and air-side), political / environmental restrictions and the economical use of resources.</p> <p>4. To increase overall ATM network capacity in line with traffic demand; ensure that ATM-induced delays are not a significant constraint and that the percentage of traffic delayed by ATM is less than today.</p>
Cost Effectiveness	5. To reduce the direct and indirect ATM-related costs per unit of aircraft operations.
Efficiency	6. To enable all airspace users to operate as efficiently as possible while accommodating both civil and military operators' needs.
Environment	<p>7. To promote the use of new ATM technologies, systems, capabilities and procedures which benefit the environment or mitigate aviation or ATM impact at global, regional and local levels.</p> <p>8. To accelerate the implementation of ATM system improvements that reduce the impact of aviation on the environment.</p> <p>9. To ensure that development and implementation of the UAE ATM Strategic Plan reflects ICAO environmental policies, and to work with ICAO and its member States to obtain improvements in ATM, in</p>

	<p>particular the accelerated implementation of those CNS/ATM concepts, procedures and systems that help to mitigate the impact of aviation on the environment.</p>
Flexibility	<p>10. To increase the responsiveness of the ATM system, and its services and processes, to real-time changes in airspace users' needs.</p>
Global Interoperability	<p>11. To ensure that UAE ATM operations are compliant with ICAO CNS/ATM plans and global interoperability requirements; provide a seamless service to the user at all times and operate on the basis of uniformity throughout UAE and the adjacent FIRs.</p> <p>12. To provide or adopt timely standards, specifications and procedures for ATM, supporting communications, navigation, surveillance and information management infrastructure and associated avionics requirements.</p> <p>13. To enable interoperability between the different elements (aircraft, airport and ATM systems) together with their seamless integration, development and upgrading to new technology.</p>
Participation by the ATM Community	<p>14. To ensure that the ATM community has a continuous involvement in the planning and, where appropriate, implementation and operation of the ATM system.</p>
Predictability	<p>15. To improve the predictability of flight operations by reducing ATM-related variations in gate-to-gate transit times.</p>

<p style="text-align: center;">Safety</p>	<p>16. To ensure safety needs are assessed against appropriate criteria and in accordance with appropriate and globally standardized safety management processes and practices.</p> <p>17 To ensure that system safety practices are implemented across all ATM community members and that an open reporting culture is demonstrated.</p> <p>18. To improve safety levels by ensuring that the rate of ATM-induced accidents and serious or risk bearing incidents is continually decreasing.</p>
<p style="text-align: center;">Security</p>	<p>19. To establish effective mechanisms and procedures that enhance the responsiveness of the ATM system to security threats and events affecting flights (aircraft and passengers) or the ATM system.</p> <p>20 To improve the effectiveness of existing, and determine new, mechanisms, criteria and structures to enhance civil-military co-operation and co-ordination</p> <p>21. To ensure access to, and availability of, airspace for military purposes through the implementation of special procedures where necessary.</p>

7 Contingency Planning

ICAO Annex 11 requires States to ensure ATS units establish contingency plans. GCAA Regulations require that the same are established.

ATS units shall establish contingency management procedures with respect to adjacent units within the UAE and the ACC shall develop procedures with the ATS units in adjacent FIRs.

8 ATM Strategic Plan

This is the strategic document and the Short Term commitment plans (Work Packages), Medium Term objectives and Long Term aspirations relating to these strategic goals are shown under Schedules 2 and 3 to the UAE ATM Strategic Plan 2012 – 2030. These Schedules may be amended from time to time without necessitating short-term revisions to the UAE Air Traffic Management Strategic Plan 2012 – 2030.

ATM evolution requires a clearly defined progressive strategy including tasks and activities which best represent the regional and national planning processes in accordance with the global planning framework. The goal is to obtain a harmonized regional implementation evolving toward a seamless global ATM system.

For this reason, it is necessary to develop short and medium term work programmes, focusing on the necessary changes to the system in which a clear work commitment will be carried out by the parties involved. It is also important to capture aspirations for the long term within the UAE Air Traffic Management Strategic Plan 2012 – 2030.

Short Term Commitment Plans:

The Short Term Commitment Plans are the work packages for the UAE Air Traffic Management Strategic Plan 2012 – 2030. They are aligned with the MIDANPIRG work programmes and reviewed on an annual basis. Changes to the Short Term Commitment Plans will be reflected in changes to Schedule 1 of the UAE ATM Strategic Plan 2012 – 2030.

Mid Term Objectives:

Mid Term Objectives fall within the 5 to 10 year planning horizon and will be updated as part of the overall 5 yearly revisions to the UAE ATM Strategic Plan. As part of that process, individual components of the Mid-Term Objectives may be elevated to Short

Term Commitment Plans in the Second Edition and subsequent versions of the UAE Air Traffic Management Strategic Plan 2012 – 2030.

Long Term Aspirations:

The Long Term Aspirations form the basis for how the future and emerging ATM system for the UAE should operate and will assist in the transition to a fully integrated and collaborative ATM system to meet the future demands of the UAE.

The Long Term Aspirations fall within the 10 to 20 year planning horizon and will be updated as part of the regular 5 yearly review of the UAE ATM Strategic Plan. Individual Long Term Aspirations may be elevated to Mid Term Objectives or Short Term Commitment Plans as part of the review process.

9 The following strategies were determined by the NASAC Work Group after taking into account the views of Airspace users etc..

9.1 Civil/Military Cooperation Strategy

Airspace is recognised as a National asset which should, except in times of National emergency, be available to all users in an organized and equitable manner.

Almost half (47%) of the UAE FIR currently restricted for military use needs to be made available in periods of little or no military activity to enable civil access thus reducing delays, fuel use and congestion currently affecting civil aviation.

Civil Aviation Law, Article 20, gives the GCAA, as the Competent Authority, the responsibility for establishing Rules relating to the use of airspace, while Article 7.2 of the GCAA Law requires the Authority to determine areas over which flying is prohibited, restricted or dangerous in coordination with the concerned authorities in the State.

The military will continue to require access to airspace sufficient to accommodate their training needs and operational readiness requirements under their National security remit. Military airspace users will require, when flight safety requirements dictate, to be separated from other air traffic in segregated airspace.

Transparency of operations, both civil and military, will require that both civil and military service providers must recognise the other's airspace requirements and that in order to maximise utilization of airspace and reduce controller workload, thus improving safety, both future ATM planning strategy and real-time coordination must be coordinated between the UAE Military and civil aviation Authorities and there should be a co-operative approach to airspace changes when necessary.

Cooperation will be needed at a number of levels:

- A National Airspace Management Committee empowered to make long term strategic decisions,
- A tactical liaison group tasked with the day to day determination of airspace reservations,
- A military cell in Air Traffic Control units as required for short term coordination.

Collaborative decision making between military planners and civil Regulatory and ATM staff will be required to accommodate the volumes of airspace required by military aircraft.

Training areas defined by fixed geographical dimensions will need to be reviewed to subdivide them into vertically and laterally segregated blocks, operationally acceptable to the military but which would release unused portions for civil use. These blocks of airspace would be managed on both a strategic and tactical level.

Positioning of training airspace will need to be more flexible recognizing both time used in transit by the military and the cost of diverting civil traffic around training areas.

Close coordination and cooperation requirements between UAE Military and civil Regulatory and ATM staff will reduce through more efficient integration of airspace and ATM systems, functions and service provision. Technical cooperation between civil and

military ANSPs will enhance the SWIM concept, allowing better management of airspace and separation requirements.

9.2 Airspace Strategy

The GCAA is required to carry out its airspace regulatory responsibilities in accordance with Article 20 of the Civil Aviation Law.

ARTICLE 20

1. The Competent Authority shall establish rules of the air and other regulations concerning overflight of aircraft, air navigation, the protection of persons and property on the surface and the use of the airspace.
2. The Competent Authority shall designate the air ways and routes to be used by aircraft when entering into, departing from or flying over the territory of the State.⁷

Paragraph 2 of this Article enables the GCAA to examine and determine future airspace requirements. GCAA policy on Regulations is migrating to a risk management/competency based rather than prescriptive basis.

The GCAA Airspace Regulation and associated CAAP 41 regarding Airspace change require a consultative process involving all affected stakeholders to ensure the optimum outcome for all involved.

The GCAA is required to adopt international best practice in Airspace Management. This recognises that other airspace systems can include characteristics and structures which could enhance activities in UAE airspace and should be considered in any airspace review.

The airspace strategy should comply with ICAO SARPs wherever possible.

Other international proven best practices may be considered provided a safety assessment, acceptable to the GCAA, shows that an equivalent level of safety is provided.

Any difference with SARPs shall be justified, documented, published in the UAE AIP and formally notified to ICAO.

⁷ Extract from Civil Aviation Law (Federal Act no. 20 dated 1991)

Competent Authority is defined as “The Ministry of Communications or the body designated from among its departments to supervise matters relating to civil aviation and its development. Until the CAL amendment is ratified, the GCAA is considered as the “Competent Authority” having evolved from the Ministry of Communication.

The airspace strategy shall be transparent to enable all stakeholders to have a clear understanding of how airspace decisions will be developed, consulted, taken and promulgated. However, when required by urgent or State security issues, the strategy shall allow for decisions to be made, without normal due process, to meet a safety imperative.

The airspace strategy shall be proactive, identifying where priorities are required in airspace change, and shall follow an airspace review policy to be set by the GCAA. Any review shall not predetermine airspace classification but shall determine the optimum classification based on the most appropriate safety requirement identified as an outcome of the airspace review.

The airspace strategy should ensure airspace configurations responsive to user demands, optimizing preferred trajectories while meeting temporary airspace reservations

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The ATM infrastructure strategy covers the civil communication, navigation and surveillance systems and capabilities used in the UAE to support the high level ATM operational goals established elsewhere in the ATM Plan.

Communication

Specific operational goals relating to communication have also been identified providing aeronautical information to all airspace users, meeting required communication performance criteria.

The functional needs for communication services will continue over the next fifteen years without significant change. Hence, changes to voice communication infrastructure will be predominantly associated with equipment replenishment, modernisation and service improvements. The utilisation of data-link techniques will grow rapidly enabling improvements to existing air/ground communications, supporting new surveillance services and progressing towards the more fully integrated communication capabilities proposed under the ATN. Voice communications will continue to be predominately based on VHF in airspace utilising 25 kHz channel spacing to accommodate traffic density however a move to 8.33 kHz or 12.5 kHz spacing will be adopted if required. Air/ground traffic will progressively move from voice services to data-link communications such as CPDLC and PDC. AMHS and ATN data link communication services will be introduced to eventually replace the existing FANS-1/A and AFTN systems. Integration of data services towards SWIM will require suitable data communication services.

Navigation

Specific operational goals relating to navigation have also been identified which support the PBN Plan already prepared and being implemented.. .

In the next fifteen years the UAE navigation infrastructure will be based upon GNSS , Inertial and the ILS navigation systems, with a backup network of terrestrial nav aids to meet contingency requirements. This approach is consistent with ICAO regional plans

Surveillance

Specific operational goals relating to surveillance have also been identified relating to the need for supporting ATS throughout UAE airspace, providing ground-based independent surveillance at designated controlled aerodromes and providing or supporting ground-based automatic dependent surveillance at major aerodromes and both ground based and airborne ADS in controlled airspace throughout UAE airspace

In the next fifteen years there will be an increase in the use of automatic surveillance techniques and a corresponding decline in pilot position reports. Both primary and secondary surveillance radar will continue to be used in busy terminal environments and Mode S capability will be a feature of the future ground-based surveillance infrastructure. ADS-B will be used widely to provide both ground and airborne surveillance and its introduction will enable the introduction of significant changes to ATM. Multilateration will become a viable and accurate means of surveillance within the next 15 years.

9.4 Aerodromes (ATM) Strategy

The aerodrome strategy should meet the aerodrome operations concept under which an aerodrome operator optimizes the ground infrastructure including, airfield lighting, taxiways, runways, runway exits and precise surface guidance to improve safety and maximize capacity in all weather conditions for which the airport is required to operate through customer demand. The strategy will also allow the aerodromes to incorporate collaborative decision making (as defined by Eurocontrol) at strategic, pre tactical and tactical stages to manage the demand capacity balance, improve predictability of operations, and provide traffic synchronization through elimination of choke points, 4-D trajectory control and optimization of traffic sequencing.

(Detailed methodologies developed by Eurocontrol in Airport Capacity Enhancement (ACE), Runway Safety, A-SMGCS and Airport CDM provide useful guidelines and may form a starting point).

As aerodromes are a focal point in the ATM system, it is important that aerodrome operators work with other stakeholders to ensure that ground capacity does not become the system constraint.

The strategy will apply to all UAE aerodromes (civilian and military) to support the overall ATM/CNS Strategic Plan. This strategy will allow the improved data flow on arriving flights to enhance traffic handling on the ground. Enhancement of the interface between airside airport operations and ATM which takes account of airport operations in route planning & vice versa and increased ability to react to last minute changes on the ground.

The aerodrome operational architecture will ensure ATM community expectations are satisfied and meet expected increases in capacity, predictability and efficiency demands through efficient design and construction of aprons, taxiways and runways and provision of appropriate landing aids and systems that support all weather operations. The airport infrastructure and systems should support provision of situational awareness between all aircraft and ground vehicles. All aerodromes should enforce aerodrome safeguarding strategy to ensure safety and viability of operations.

The Aerodrome Strategy and corresponding work plans should help accomplish various MIDANPIRG/12 performance objectives.

9.5 AIM Strategy -Overcoming the Shortcomings - From AIS to AIM

The purpose of the Aeronautical Information Management Strategy is:

To achieve a uniform and efficient aeronautical information management structure, based on system wide information management, to support all phases of flight.

AIS must make the transition from the supply of predetermined products to the management of data from which Aeronautical Information in its entirety can be extracted

and subsequently customized in a variety of ways to serve future ATM needs.

This challenge will be met by the transition to AIM. AIM will be responsible for both the content (including formats, timeliness, collection, checking, distribution, etc.) and the proper management of the data (storage, consistency between databases, interfacing with other systems, etc.). AIM will manage data on the basis of the System Wide Information Management (SWIM) concept which is a globally all-encompassing, structured but open approach to data management. Progressive implementation of the SWIM principles in AIM is in fact AIM's evolution to IM, or Information Management that is fully SWIM based and which is the ultimate goal.

User applications are an important new element of the concept. AIM will ensure that user applications can access data immediately and from any location, including aircraft in flight or on the ground, where appropriate connectivity is available. The role of user applications is to transform data into aeronautical information, customized to the specific requirements of a given user at a given time. User applications for self-briefing, flight planning, operational control, CDM and in-flight use (e.g. Electronic Flight Bag - EFB, 4D displays for taxiing) can be envisaged among others. These applications will also be system independent, scalable and will cover the needs of a broad spectrum of aeronautical information users.

In AIM, the frontier between textual and graphical formats will dissolve. Only data of the required quality will be managed and made available, and it will be the role of the applications to select and then intelligently use and if required display information in whichever format (textual or graphical) is the most appropriate and as requested by the user.

AIM will be able to meet users' needs on several levels. It will be a significant driver of the transition also on the user side. It will offer superior data service and total flexibility for users via the user applications concept. It will also retain the ability to offer traditional AIS products to users who have yet to make the transition (AIS is one component of AIM). This will be achieved by the UAE AIS Database.

AIM is a concept for managing the content of aeronautical data and the data itself, providing quality assured data to user applications for the benefit of all aviation stakeholders. Its open standards and common data exchange models will ensure platform independence and Interoperability.

Appropriate rules and procedures will be developed to ensure that all data sources meet the AIM requirements for data quality.

9.5.1 Expected Benefits

AIM will bring benefits to all parts of the ATM system by enabling the provision of aeronautical data of the required quality, accessible by all users (human as well as systems) at all times. As such, it will especially contribute to:

Safety – Timely and accurate aeronautical data of the appropriate scope is essential for the safe use of modern ATM and navigation techniques.

ATM performance – AIM is an essential enabler for concepts like CDM and enhanced airspace management.

Flight Efficiency – The interaction of all elements of gate-to-gate activities will be harmonized to create the “Time Ordered ATM System”, to efficiently exploit the full capacity of airports and airspace.

Enabling User Applications – A basic tenet of the AIM concept is the provision of aeronautical data of the required quality in standard format, without prejudice as to how the data will be used. Specific rules and procedures for ATM and aircraft operation will ensure proper usage.

Uniformity and interoperability of systems – AIM acts in the direction of improved uniformity and interoperability both on a regional level, and on a global scale.

Cost effectiveness - AIM offers a cost effective, uniform data management environment meeting the needs of all users in an open and interoperable networked system.

9.5.2 Electronic Flight Bag

The ability to use different media for data transmission directly to the flight deck is will reduce pilot workload, improve situational awareness, and improve efficiency and related reduction in cost and emissions while meeting the operator's requirement to provide to the crews information that can affect the flight(s) as and when it becomes available

The EFB will also facilitate the ability for crew to have one easily accessible source for the data and information necessary to conduct the flight and reduce the use of paper in the cockpit. All Regulatory CAR-OPS and Operational requirements must be taken into account.

Information that can be uplinked either on a request or a push/pull concept would include, but not limited to, latest NOTAM, SIGMETS, volcanic activity, Airspace restrictions etc. that enable the crews to make informed decisions on the latest available data.

Aircraft have and are being fitted with Airport Moving Maps to mitigate runway incursions/excursions and increase situational awareness. The ability to overlay ATC instructed taxi routes, preferred runway exits and taxiway closures will also increase the efficiency of the operation and the airport and the level of safety.

Those airports and agencies that supply Gatelink or wi-fi communication facilities can maximize the efficiencies and safety of the operation.

9.6 MET Strategy

The National Centre for Meteorology and Seismology (NCMS), established as the Meteorological Authority for the UAE under Law number 6 of 2007, is responsible for the provision of meteorological services to transportation amongst other things.

Civil Aviation Law, article 3, paragraph c, requires that the provisions of this Law shall apply in respect of Civil Airports in all technical activities such as Meteorological services to aviation.

Article 4 states that the Competent Authority shall supervise all matters relating to civil aviation and its development in the State. It shall also supervise the compliance with the generally acceptable international regulations at the airports of the State, and monitor the implementation thereof, in coordination with the local Authorities.

The GCAA Law, Article 6, paragraph 1, states that the GCAA shall undertake, in coordination with local authorities and concerned bodies, the execution of the Civil Aviation Law, including implementation of international agreements and treaties in the fields of civil aviation and Meteorology.

The Meteorological strategy is to comply with Annex 3 requirements to contribute to the safety, efficiency and regularity of international air navigation. This shall be achieved by supplying all stakeholders with the meteorological information required for the performance of their various functions. Meteorological services currently supplied by the airport's individual ANSPs shall progressively be taken over by the NCMS.

Under the agreed working arrangements between the International Civil Aviation Organisation (ICAO) and the World Meteorological Organisation (WMO), ICAO has the responsibility for examining existing observational networks from the standpoint of their adequacy to provide Met services to international aviation, whilst WMO is responsible for planning synoptic surface and upper-air observational networks to meet all Met requirements. The exchange of operational Met data specifically for civil aviation purposes is an ICAO requirement and aeronautical telecommunication facilities are used for this purpose.

Therefore, in the UAE context, the GCAA will retain an oversight of all NCMS functions and units providing aviation meteorological services.

9.7 Search and Rescue Strategy (SAR)

Search and Rescue services within the UAE Search and Rescue Region (SRR) are presently provided by two authorities: GHQ in the Abu Dhabi Emirate and Dubai Police in the Northern Emirates. The Convention on International Civil Aviation requires that a State shall establish a single Rescue Coordination Centre (RCC), and Rescue Sub-centres (RSC) as deemed appropriate, in each SRR. The RCC can provide either civil aviation SAR services alone or, if established as a Joint RCC (JRCC), both aviation and maritime SAR services.

As the GCAA mandate to regulate and oversight SAR extends only to civil aviation operations, and bearing in mind the immense task of establishing effective SAR services in all of the maritime, terrestrial and military sectors, as well as civil aviation, GCAA considers that its responsibilities can most effectively be met by ensuring that civil aviation SAR is properly established within the family of civil aviation services treated by the Chicago Convention and established as a distinct civil aviation service. This may be done by either establishing a separate Aviation RCC (ARCC) or a separate aviation SAR stream within a Joint RCC (JRCC).

The Emirates SRR is approximately coincident with the UAE Flight Information Region. The organizational structure of civil aviation SAR services will have no immediate impact on airspace design. The RCC will, however, independently or in cooperation with an RSC (or RSCs), have a SAR service responsibility throughout the entire SRR.

The SAR involvement of ATM extends from the provision of In-Flight Emergency Response (IFER) services, (that must effectively interface with SAR services), to SAR Alerting, (including evaluation of emergency events), and, as and when required, initial

coordination of SAR operations pending the assumption of responsibility by the RCC. ATM is then required to continue assisting the RCC with relevant data and supportive actions, (for example, tactical airspace management), until the emergency response is terminated.

9.8 Navigation Strategy

The Navigation Strategy shall be that contained within the UAE PBN Strategy document with the associated timetables for implementation.

9.9 Schedules to the UAE ATM Strategic Plan

- Demand and Traffic forecasting shown at Schedule 1
- Strategic Objectives shown at Schedule 2
- Short, Medium and Long Term objectives shown at Schedule 3
- Detailed strategic action activities, timetables and responsibilities are shown at Schedule 4.

References

Global Air Traffic Management Operational Concept	ICAO Doc 9854
Global Air Navigation Plan	ICAO Doc 9750
Manual on Global Performance of the Air Navigation System	ICAO Doc 9883
Performance Based Navigation Manual	ICAO Doc 9613
Safety Management Manual	ICAO Doc 9859
Manual on Air Traffic Management (ATM) System Req'ments 2	ICAO Doc 9882
Basic Air Navigation Plan – Middle East Region	ICAO Doc 9708
PANS-ATM	ICAO Doc 4444
Annex 11	
Global Aviation Safety Plan	
MIDANPIRG	
Facilities and Services Implementation Document	MID FASID

Schedule 1 2015, 2020 and 2030 UAE Airspace Forecast

**UAE National Airspace Advisory Committee (NASAC)
Forecast Working Group**

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Mandate

The NASAC working group number 3 had been formed to prepare a future forecast of number and type of aircraft operations in the UAE airspace including civilian airliners, cargo, military, GA, private and helicopter movements. These will include all IFR and VFR operations originating or terminating in UAE airspace and over flights transiting through the UAE FIR.

Membership

The group comprises of members from Abu Dhabi Airports Company (ADAC), Dubai Airports (DA) and General Civil Aviation Authority (GCAA) ANA Section.

Purpose:

The purpose of this forecasting project is to support the development of a UAE ATM strategic master plan which will identify the ATM capacity requirements in the UAE. The resulting forecast will also be used to support the development of a UAE airspace master plan, which may form the basis of restructuring of the UAE airspace and the required interfaces with adjacent FIRs.

Scope and Product :

The forecast group will prepare a short (2015), medium (2020) and long term (2030) forecast based on 2010 operations.

- The forecast group will collect all available information for 2010 and will prepare a baseline that will be used to prepare the forecasts.
- The group will collect all available unconstrained forecast for the ten civilian airports (Abu Dhabi International, Al Ain International, Al Bateen Executive, Delma and Sir Baniyas Island, Dubai International, Dubai World Central, Sharjah International, Fujairah International and Ras Al Khaimah International Airports). In case no forecast is available for an airport, average growth factors based on historical data will be used to prepare forecasts. The unconstrained individual forecast for each airport will be added together to prepare a forecast for the whole UAE. No adjustment will be made to individual airport forecasts other than to ensure that the same parameters are used for each airport.
- The forecast group will also estimate the current and future use of the airspace by documenting the current entry/exit fix usage and predict the future loadings on these fixes if no changes are made. This will help in prioritizing the need to improve the airspace structure and bilateral negotiations by geographical areas.
- The military data will be analyzed and presented if made available to the group.
- It is recommended that as a next step, this forecast be verified by an independent third party consultant to confirm the validity of forecast numbers by conducting additional econometric analysis on a UAE wide basis.

UAE Airspace Forecast Baseline

In 2010, a total number of 608,877 operations took place at the civilian airports along with 140,821 overflights for the UAE FIR. **Table 1** shows all the historical data that was collected from 2000 to 2009. The details on operations in 2010 for each of the airports are given below.

Abu Dhabi International Airport

In 2010 a total of 112,010 operations took place at Abu Dhabi International Airport. The average daily operations were 307 per day. These numbers represent an increase of 9.7% from 2009.

Al Bateen Executive Airport

In 2010 a total of 23,707 operations took place at Al Bateen Executive Airport. The average daily operations were 65 per day. These numbers represent an increase of 8.5% from 2009.

Al Ain International Airport

In 2010 a total of 68,298 operations took place at Al Ain International Airport. The average daily operations were 187 per day with the majority of operations being civilian and military training operations. These numbers represent a decrease of 10.0% from 2009.

Sir Baniyas and Delma Island Airport

In 2010 a total of 2,460 operations took place at Sir Baniyas and Delma Island Airports. The average daily operations were 7 per day. These numbers represent a decrease of 2.0% from 2009.

Dubai International Airport/Dubai World Central

In 2010 a total of 296,205 operations took place at Dubai International Airport at an average of 812 daily operations. These numbers represent an increase of 6.3% from 2009. Dubai World Central Airport opened in June 2010 for cargo operations which are averaging 3-5 operations a day.

Sharjah International Airport

In 2010 a total of 71,259 operations took place at Sharjah International Airport. The average daily operations were 195 per day. These numbers represent an increase of 16.0% from 2009.

Fujairah International Airport

In 2010 a total of 21,280 operations took place at Fujairah International Airport. The average daily operations were 58 per day. These numbers represent an increase of 4.0% from 2009.

Ras Al Khaimah International Airport

In 2010 a total of 13,658 operations took place at Ras Al Khaimah International Airport. The average daily operations were 37 per day. These numbers represent an increase of 68.3% from 2009.

Over Flights

There were 140,821 over flight operations in UAE FIR in 2010. These numbers represent an increase of 14.8% from 2009.

Table 1 – UAE Airports Historical Data (2000 – 2009)

Airport	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Abu Dhabi Airport	n/a	n/a	65,987	57,636	73,982	76,633	75,434	82,287	93,163	102,116
Al Bateen Executive Airport ¹	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	21,855
Al Ain Airport	n/a	n/a	65,567	57,636	45,771	56,741	42,401	44,769	52,157	76,544
Sir Baniyas and Delma Airport ¹	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	2,520
Dubai Airport	141,282	134,174	149,843	168,526	195,820	217,165	237,258	260,530	270,377	278,501 ²
Sharjah Airport	25,997	24,431	24,803	28,017	32,334	38,669	44,182	51,314	60,813	61,451
Fujairah Airport	9,216	8,256	10,243	14,728	9,163	8,238	10,772	12,337	20,266	20,467
Ras Al Khaimah Airport	8,261	8,811	8,106	7,082	7,484	8,022	7,547	8,595	9,200	8,116
Total	184,756	175,672	324,549	333,625	364,554	405,468	373,435	459,832	505,976	571,750

Notes:

1. Historical Data for Al Bateen Executive Airport, Delma Island Airport and Sir Baniyas Island Airport is not available due to transfer from military.
2. The 2000 to 2009 number for Dubai Airport includes military and helicopter. The total operations at Dubai Airport without military and helicopters in 2009 was 235,602.

Short Term (2015), Medium Term (2020) and Long Term (2030) Forecast

Table 2 shows the consolidated forecast for all airports. The total number for flights will increase from 608,877 in 2010 to approximately 1,533,409 in 2030. The cumulative annual average growth rate is estimated to be 6.8% from 2010 to 2015, 4.8% from 2015 to 2020 and 3.7% from 2020 to 2030 for total civilian operations in UAE airspace. The average number of daily flights will increase from 1,668 in 2010 to 4,201 in 2030. It should be noted that all forecasts used for this report are unconstrained forecasts and may change as required by facility constraints.

The total number of overflights will increase from 140,821 in 2010 to approximately 373,640 in 2030 at a cumulative annual average growth rate of 5% throughout this timeframe.

Abu Dhabi International Airport

The forecast increase in operations at Abu Dhabi Airport is attributed to growth of Etihad Airways and economic and tourism development of Emirate of Abu Dhabi. It is expected that annual operations at the airport will grow to 156,800 in 2015 (7.0% from 2010-2015), 200,000 in 2020 (5% from 2015-2020) and 272,000 in 2030 (3.1% from 2020-2030). The forecast numbers were obtained from Abu Dhabi International Airport Master Plan.

Al Bateen Executive Airport

The forecast increase in operations at Al Bateen Executive Airport is attributed to growth of executive business jet operations and economic development of Emirate of Abu Dhabi. It is expected that annual operations at the airport will grow to 27,498 in 2015 (3.0% from 2010-2015), 35,983 in 2020 (5.5% from 2015-2020) and 54,501 in 2030 (4.2% from 2020-2030). The forecast numbers were obtained from Draft Al Bateen Executive Airport Master Plan.

Al Ain International Airport

The forecast increase in operations at Al Ain Airport is attributed to growth of military and civilian training flights and development of aerospace cluster at Al Ain Airport. It is expected that annual operations at the airport will grow to 83,000 in 2015 (4.0% from 2010-2015), 105,000 in 2020 (4.8% from 2015-2020) and 163,481 in 2030 (4.5% from 2020-2030). The forecast numbers were obtained from Al Ain International Airport Master Plan.

Sir Baniyas and Delma Island Airport

The forecast increase in operations at Sir Baniyas and Delma Airports is attributed to growth in tourism to desert islands in the western region. It is expected that annual operations at the two airports will grow to 7,960 in 2015 (26.5% from 2010-2015), 9,622 in 2020 (3.9% from 2015-2020) and 10,006 in 2030 (0.4% from 2020-2030). The forecast numbers were obtained from Draft Sir Baniyas and Delma Airport Master Plan.

Dubai International Airport/Dubai World Central

The forecast increase in operations at Dubai Airport and Dubai World Central Airport is attributed to growth of Emirates Airlines and economic and tourism development of Emirate of Dubai. It is expected that combined annual operations at the two airports excluding military and helicopters will grow to 447,364 in 2015 (8.6% from 2010 to 2015), 562,867 in 2020 (4.7% from 2015-2020) and 806,967 in 2030 (3.7% from 2020-2030). The unconstrained forecast numbers were obtained from forecast prepared by Dubai Airports. The exact timeline of the split between the two airports is currently not available.

Sharjah International Airport

The forecast increase in operations at Sharjah Airport is attributed to growth of Air Arabia. It is expected that annual operations at the airport will grow to 82,125 in 2015 (2.9% from 2010-2015), 109,500 in 2020 (5.9% from 2015-2020) and 164,250 in 2030 (4.1% from 2020-2030). The forecast numbers were generated based on aircraft acquisition plan for Air Arabia and projected number of sectors per aircraft per day provided by Air Arabia.

Fujairah International Airport

The average growth in operations at Fujairah Airport was calculated by reviewing historical data and projecting it forward. It is expected that annual operations at the airport will grow to 21,726 in 2015, 22,834 in 2020 and 25,223 in 2030 (1.0% from 2010-2030).

Ras Al Khaimah International Airport

The average growth in operations at Al Khaimah Airport was provided by the airport authority. It is expected that annual operations at the airport will grow to 17,431 in 2015, 22,247 in 2020 and 36,238 in 2030 (5.0% from 2010-2030).

Over Flights

The forecast increase in over flights for UAE FIR is attributed to growth in regional airports. It is expected that annual over flights will grow at an annual 5% rate to 179,727 in 2015, 229,382 in 2020 and 373,640 in 2030.

Table 2 – UAE Airports Forecast

Airport	2010		2015		2020		2030	
	Total	Avg/Day	Total	Avg/Day	Total	Avg/Day	Total	Avg/Day
Abu Dhabi Airport	112,010	307	156,800	430	200,000	548	272,000	745
Al Bateen Executive Airport	23,707	65	27,498	75	35,983	99	54,501	149
Al Ain International Airport	68,298	187	83,000	227	105,000	288	163,481	448
Sir Baniyas and Delma Airport	2,460	7	7,960	22	9,622	26	10,006	27
Dubai Airport and Dubai World Central	296,205	812	447,364	1,226	562,867	1,542	806,967	2,211
Sharjah Airport	71,259	195	82,125	225	109,500	300	164,250	450
Fujairah Airport	21,280	58	22,365	61	23,506	64	25,966	71
Ras Al Khaimah Airport	13,658	37	17,431	48	22,247	61	36,238	99
Total	608,877	1,668	844,543	2,314	1,068,725	2,928	1,533,409	4,201
Overflights	140,821	386	179,727	492	229,382	628	373,640	1,024

Sources:

5. Abu Dhabi International Airport, Al Ain International Airport, Al Bateen Executive Airport, Sir Baniyas and Delma Island Airport forecasts were provided by Abu Dhabi Airports Company.
6. Dubai Airport and Dubai World Central Airport forecasts were provided by Dubai Airports. The forecast numbers have not been separated between the two airports and doesn't include military and helicopter movements.
7. Sharjah International Airport, Ras Al Khaimah and Fujairah International Airport forecasts were prepared by the Forecast Workgroup based on data provided by the relevant airport authorities.
8. Overflights data was provided by GCAA Sheikh Zayed Center. Forecast Workgroup applied a 5% growth rate to calculate the future numbers.

Exhibit 1 – Forecast Annual Operations at UAE Airports

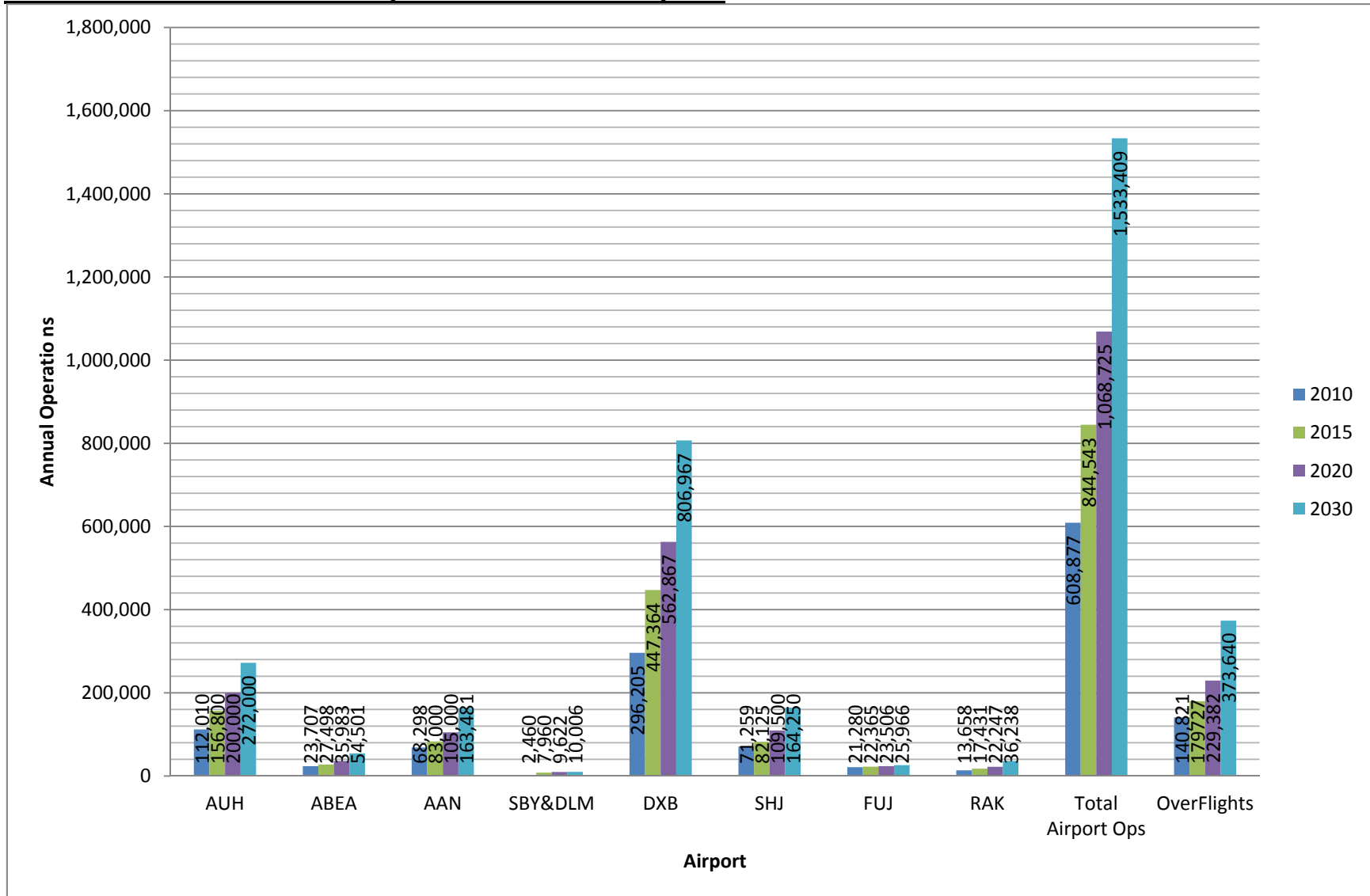
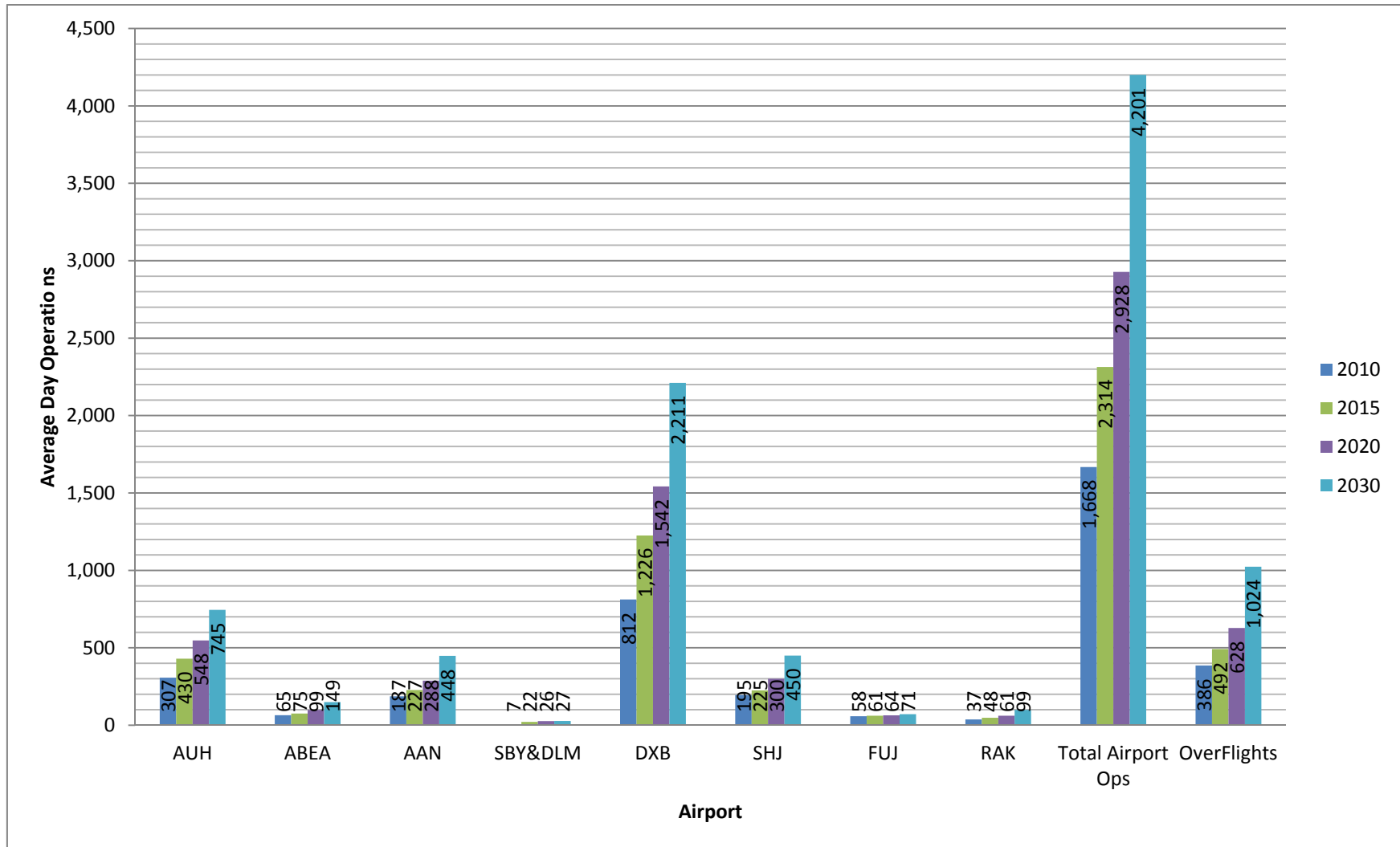


Exhibit 2 – Forecast Average Day Operations at UAE Airports



AUH, DXB and SHJ Departures by Region

Table 3 shows the distribution of daily operations at Abu Dhabi International Airport, Dubai International Airport/Dubai World Central and Sharjah International Airport among geographical regions. The MENA (middle east and north africa) region will continue to be the primary market for operations followed by Asia (Mid) and Europe (N/W) regions.

Table 3

Region	AUH, DXB/DWC ¹ and SHJ Departures by Region			
	2010	2015 forecast	2020 forecast	2030 forecast
MENA	239	313	378	552
Asia (Near)	64	88	108	154
Asia (Mid)	113	173	222	332
Asia (Far)	64	117	149	223
Europe (N/W)	89	97	123	149
Europe (S/E)	25	76	96	160
Africa (N)	21	40	54	81
Australasia	13	33	41	69
Africa (S)	13	24	29	43
America (N)	15	28	37	53
America (S)	1	3	5	7
Total	656	992	1241	1,824

Notes:

1. The daily departures for DXB/DWC are for peak day.

AUH, DXB and SHJ Departures by Quadrant

Table 4 shows the distribution of operations at Abu Dhabi International Airport, Dubai International Airport/Dubai World Central and Sharjah International Airport among geographical quadrants. The operations in the East quadrant are expected to be greater than the North west quadrant by 2015 followed by West quadrant. This trend is then expected to continue till 2030.

Table 4

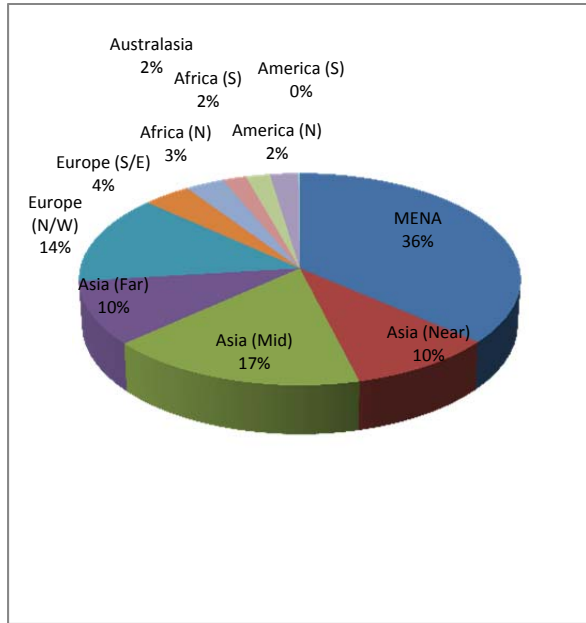
Quadrants	AUH, DXB/DWC ¹ and SHJ Departures By Quadrant			
	2010	2015 forecast	2020 forecast	2030 forecast
N	53	78	103	154
S	11	19	21	29
E	178	285	365	546
W	118	155	188	276
NE	52	69	85	116
NW	188	273	335	478
SE	27	56	68	108
SW	29	57	76	117
Total	656	992	1,241	1,824

Notes:

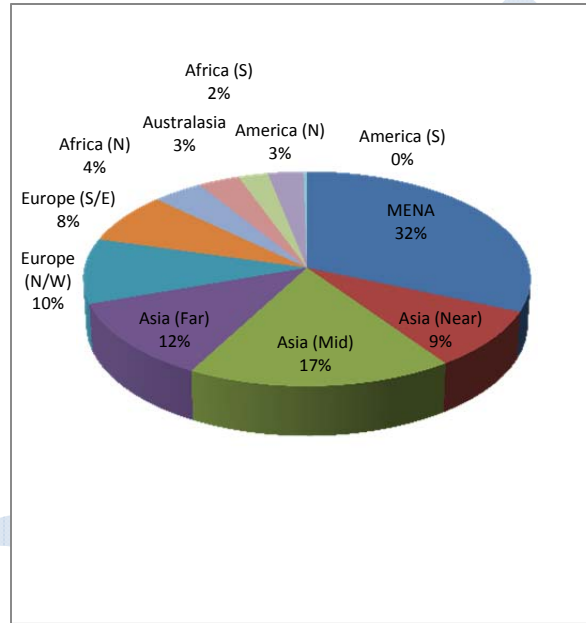
1. The daily departures for DXB/DWC are for peak day.

Exhibit 3 - AUH, DXB and SHJ Departures by Region

2010



2015



2020

2030

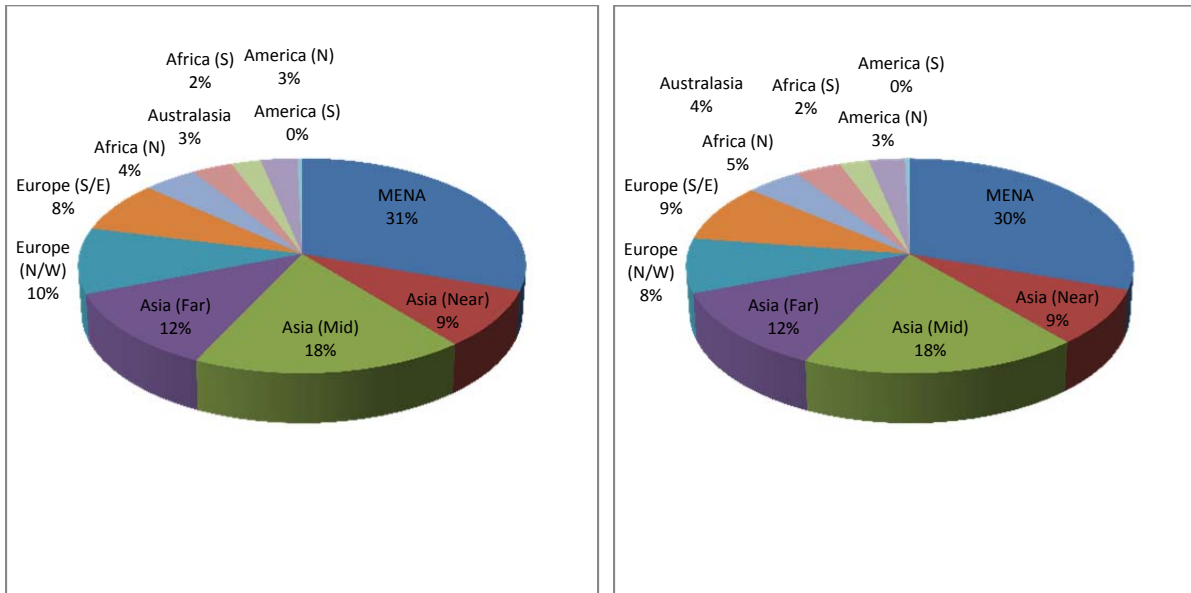
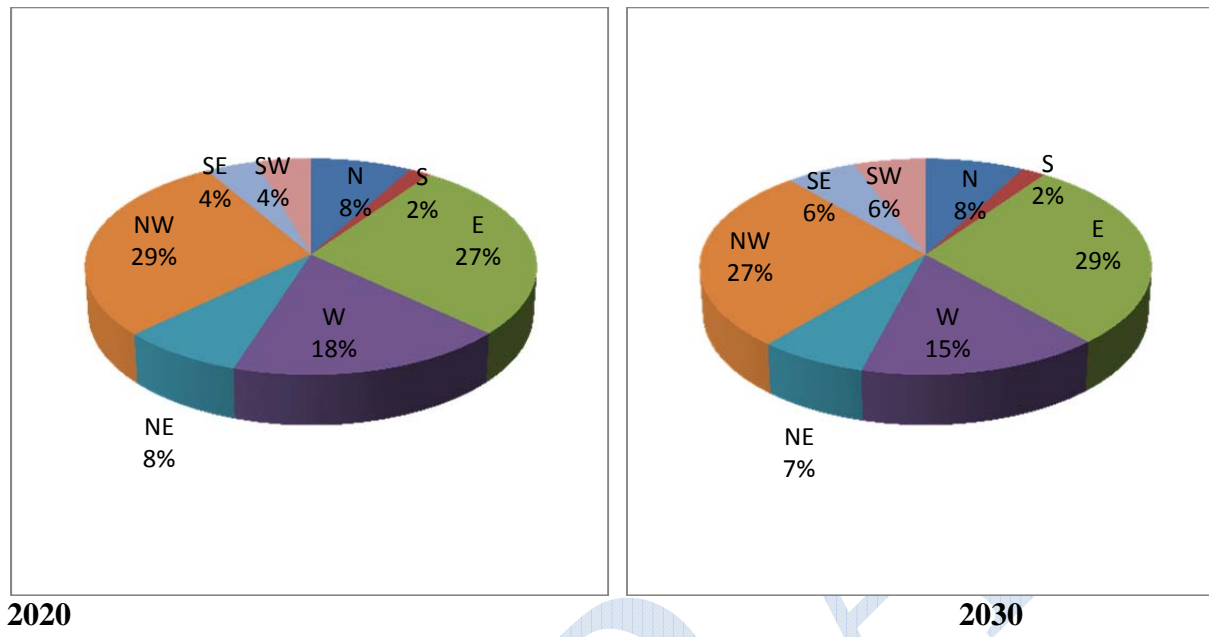


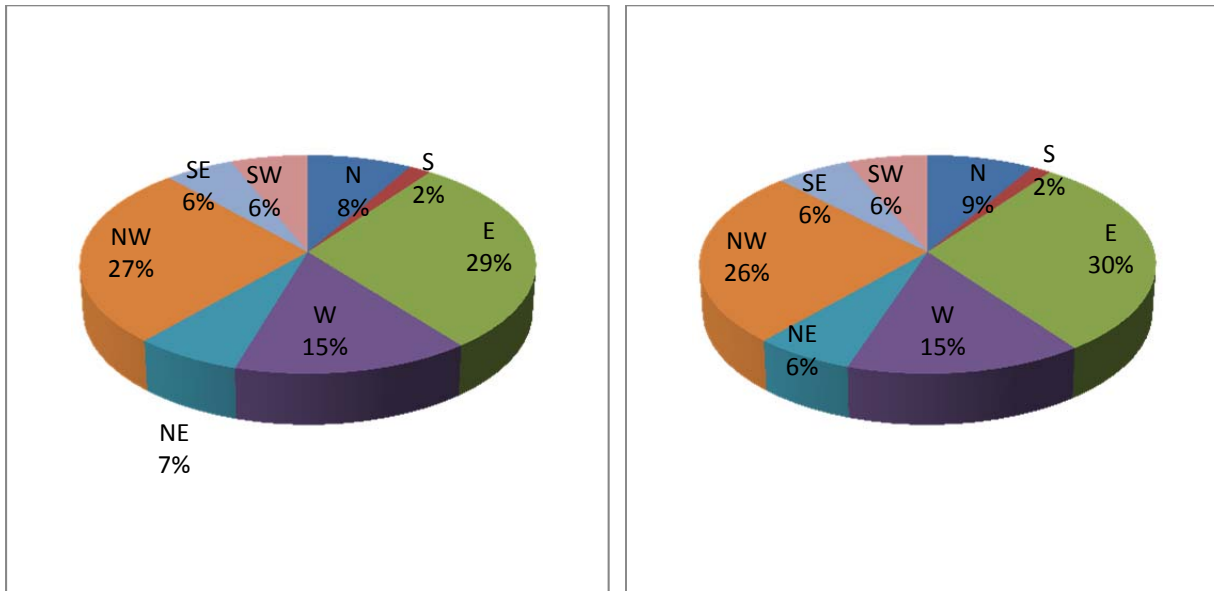
Exhibit 4 - AUH, DXB and SHJ Departures by Quadrant
 2010

2015

UAE Air Traffic Management Strategic Plan 2012 – 2030
Schedule 1



UAE Air Traffic Management Strategic Plan 2012 – 2030
Schedule 1



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AUH, DXB and SHJ Airspace Entry/Exit Gate Usage

Table 4,5 and 6 shows the number of aircraft operations (arrivals and departures) using the various entry and exit airspace fixes in 2010 and forecast of 2015, 2020 and 2030.

Table 4 - Airspace Fixes Used by Abu Dhabi International Airport Arrival and Departure Operations

	2010	2015	2020	2030
Arrivals				
BOXAK	62	88	112	152
ASROM	9	13	16	22
ROVOS	56	79	101	138
NOBTO	26	35	45	62
Total	153	215	274	373
Departures				
DASLA	14	20	26	35
NIBAX	61	86	110	149
EMERU	19	27	34	47
KANIP	58	82	104	142
Total	153	215	274	373

Table 5 - Airspace Fixes Used by Dubai International Airport Arrival and Departure Operations

	2010	2015	2020	2030
Arrivals				
BUBIN	124	219	273	421
DARAX	40	67	93	144
DESDI	206	316	372	537
MIADA	36	63	80	123
Total	406	664	817	1225
Departures Including PAPAR				
DARAX	43	51	70	104

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LALDO	86	142	180	269
MIADA	24	41	50	74
PAPAR	0	141	174	260
RANBI	208	199	232	348
TARDI/GIDIS	46	91	113	169
Total	406	664	817	1225
Departures Without PAPAR				
DARAX	43	72	94	144
LALDO	86	142	180	272
MIADA	24	41	50	76
RANBI	208	319	381	552
TARDI/GIDIS	46	91	113	182
Total	406	664	817	1225

Table 6 - Airspace Fixes Used by Sharjah International Airport Arrival and Departure Operations

	2010	2015	2020	2030
Arrivals				
BUBIN	31	36	48	73
DARAX	15	17	23	34
DESDI	48	56	74	111
MIADA	3	4	5	8
Total	97	113	150	225
Departures				
DARAX	9	11	15	22
LALDO	27	31	41	62
MIADA	3	4	5	8
RANBI	48	56	74	111
TARDI/GIDIS	9	11	15	22
Total	97	113	150	225

Schedule 2 Serial Number/year MIDANPIRG Ref	What	Why	KPI	Metrics	Strategic Actions
1/2012 12- 5.5D	Enhance Civil/Military Coordination and Cooperation	<ul style="list-style-type: none"> • Improve safety through better understanding of airspace user requirements. • Improve efficiency through more direct routes. 	<ul style="list-style-type: none"> • Number of ATS routes not implemented due to Military restrictions. • Number of Conditional Routes (CDR) implemented in accordance with user requirements. • Number of reported incidents related to uncoordinated flights operating over high seas. 	<ul style="list-style-type: none"> • Reduction of the number of ATS routes not implemented due to Military restrictions. • Increase the number of Conditional Routes (CDR) implemented in accordance with user requirements. • Reduction of the number of reported incidents related to uncoordinated flights operating over high seas. • Improved coordination and cooperation between military and civil ATC units. 	<ul style="list-style-type: none"> • Collaborative review of military’s airspace requirements. • Improve civil access to military airspace during low military activity periods. • Develop FUA concept to maximum level possible. • Enhance Civil Military ATS cooperation and understanding. • Review the size and operational hours of Restricted and Danger Areas.

2/2012	Improve Demand and Capacity Balancing	<p>Improve efficiency through traffic management and removal of chokepoints. Improve safety. Reduction of fuel consumption and emissions.</p>		Reduction in holding delays	<ul style="list-style-type: none"> • Develop methods to establish demand/capacity forecasting • Coordinate capacity improvement plans with adjoining FIRs and liaise with ICAO (MIDANPIRG) as required. • Queue Management (Demand and Capacity Balancing); including Arrival Management; Departure Metering; and Departure Management. • Continue to increase capacity ahead of demand based on regular and accurate demand/capacity forecasting.
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<p>3/2012 12-5.5D</p>	<p>Optimization of the ATS Route Structure in en-route Airspace</p>	<p>Improve efficiency</p>	<p>Status of implementation of RNAV 1 in UAE airspace.</p> <p>Status of implementation of MID ATS Route Catalogue routes in UAE airspace.</p> <p>Status of implementation of RNAV 5 in the level band FL 160-FL 460 in UAE Airspace.</p> <p>Status of duplicated 5LNCs in UAE airspace.</p> <p>Status of deficiencies related to non implementation of ATS Routes in UAE airspace.</p> <p>Status of implementation of 20NM longitudinal separation in UAE airspace.</p>	<p>Percentage of RNAV 1 routes implemented, in accordance with the MID Basic ANP</p> <p>Percentage of ATS routes implemented, against those listed in the MID Basic ANP</p> <p>Degree of implementation of RNAV 5 in the level band FL 160-FL 460 in UAE Airspace.</p> <p>Number of duplicated 5LNCs in UAE airspace.</p> <p>Number of eliminated deficiencies related to non implementation of ATS Routes in UAE airspace</p> <p>Percentage of routes where 20NM longitudinal separation not implemented in UAE airspace</p>	<p>Development of UAE Airspace Concept based on PBN Implementation Plan</p> <p>Plan for the introduction of civil access to/from military airspace in the Western Region of the Emirate of Abu Dhabi</p> <p>Identify and analyse traffic flow problems and develop methods for improving efficiencies</p> <ul style="list-style-type: none"> • Point to point navigation including UPRs. • Introduce CDO and CCD. • Continue to increase capacity ahead of demand based on regular and accurate demand/capacity forecasting. • Review ATS Contingency plans in coordination with adjoining FIRs and ICAO.
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<p>4/2012 12-5.5D</p>	<p>Optimization of the ATS Route Structure in Terminal Airspace</p>	<ul style="list-style-type: none"> • Improve efficiency • Reduce ATS Workload 	<ul style="list-style-type: none"> • Status of implementation of PBN routes in terminal airspace in UAE • Status of implementation of SIDs and STARs 	<ul style="list-style-type: none"> • Percentage of possible PBN routes established in terminal airspace • Percentage of airports where SIDs and STARs are implemented 	<p>Development of UAE Airspace Concept based on PBN Implementation Plan</p> <p>Plan for the introduction of civil access to/from new Airports established within the Western Region of the Emirate of Abu Dhabi</p> <p>Identify and analyse traffic flow problems and develop methods for improving efficiencies</p> <ul style="list-style-type: none"> • Point to point navigation including UPRs. • Introduce CDO and CCD. • Continue to increase capacity ahead of demand based on regular and accurate demand/capacity forecasting. • Review ATS Contingency plans in coordination with adjoining FIRs and ICAO.
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<p>5/2012 12-5.5D</p>	<p>Implementation of RNAV and Vertically Guided RNP Approaches</p>	<ul style="list-style-type: none"> • Improve capacity, safety and efficiency at aerodromes • Reduction in fuel emissions 	<ul style="list-style-type: none"> • Status of implementation of RNAV/RNP approaches in UAE • Status of implementation of PBN approaches in UAE 	<ul style="list-style-type: none"> • Percentage of runways provided with RNAV /RNP approaches • Percentage of runways provided with PBN approaches 	<p>Development of UAE Airspace Concept based on PBN Implementation Plan</p> <ul style="list-style-type: none"> • Design and implement RNPAPCH with Baro-VNAV in accordance with the UAE PBN Implementation Plan • Design and implement RNP AR APCH procedures where required
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<p>6/2012 12-5.5E</p>	<p>ATM Infrastructure Strategy for the UAE</p>	<ul style="list-style-type: none"> • Improved coordination • Reduced ATC workload • Better information management • Enhance introduction of technology into ATM solutions • Identify the CNS infrastructure required to support ATS throughout the UAE FIR and cognizant of regional interoperability requirements. • Develop single ANSP concept 	<p>Protection of the current aviation frequency spectrum</p> <p>Status of use of allocated SSR codes in UAE .</p> <p>Minimise improper use of 5LNC in UAE airspace</p>	<p>Reduce number of times SSR codes not available or issued improperly</p> <p>Reduction in number of conflicts in 5LNC within UAE airspace.</p>	<p>Strategy for the implementation of GNSS within the UAE</p> <ul style="list-style-type: none"> • SSR Code Management • 5 Letter Code allocations, to Regulator and review of fix naming policy. • Radio Spectrum Management and processes to protect the aeronautical spectrum • Improvement of communication infrastructure related to ATN implementation • Implementation of advanced technologies to support data link services • Implementation of advanced technologies to support data link services • Phase out Navigation aids not required for Precision Approach procedures.
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7/2012	Improve ATM Situational Awareness	<ul style="list-style-type: none"> • Reduce ATC workload • Improve route efficiency • Improve safety 	<ul style="list-style-type: none"> • Status of Surveillance plan • Status of data sharing 	<ul style="list-style-type: none"> • UAE Participation in MID Surveillance road map • Percentage of possible States with whom UAE shares surveillance data 	<ul style="list-style-type: none"> • Improve ATM Situational Awareness, including Surveillance Infrastructure (Multi-Lateration; ADS-B; etc.)
8/2012 12-5.5D	Implementation of the new ICAO FPL Form	<ul style="list-style-type: none"> • Improved information management 	<ul style="list-style-type: none"> • Status of implementation of ICAO new FPL provisions at aerodromes and ANSPs in UAE • Status of UAE updates in the FITS 	<ul style="list-style-type: none"> • Implementation according to schedule of new IFPL requirements • Percentage of aerodromes and ANSPs implemented the new IFPL 	<ul style="list-style-type: none"> • Meet ICAO timetable for introduction. • Completion date 12 November 2012

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<p>9/2012 12-5.5B</p>	<p>Improvement of the quality and efficiency of Aerodrome Facilities, Services and enhancement of Safety of Runway Operations</p>	<ul style="list-style-type: none"> • Improve Aerodrome efficiency and capacity. • Reduction in noise and emissions. • Reduction in delays • Safer operations in all weather conditions • Reduced runway incursions/excursions. 	<ul style="list-style-type: none"> • Status of readiness for new aircraft at UAE airports. • Status of Runway safety programmes at UAE airports. 	<ul style="list-style-type: none"> • Number of unresolved aerodrome deficiencies/findings at UAE aerodromes. • Number of runway excursions/incursions at UAE airports. • 	<ul style="list-style-type: none"> • Evaluate aerodrome infrastructure to accommodate fleet changes • Implement aerodrome infrastructure changes to accommodate fleet changes • Annual review of Aerodrome infrastructure to accommodate fleet changes • Maximise Aerodrome capacity in all weather conditions(according to the Airport Capacity Enhancement – ACE principles defined by Eurocontrol) • Improve safety of aerodrome operations • Improve runway incursion prevention(according to the European Action Plan for the Prevention of Runway Incursions - EAPPRI) • Improve runway excursion prevention(according to the European Action Plan for the Prevention of Runway Excursions - EAPPRE) • Develop, implement and make available to ATM at aerodromes, a positioning system for all vehicles and aircraft operating on the movement area, on a cost benefit basis. • Implement collaborative aerodrome operational procedures with ATM, ground service providers and associated operations support services.
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<p>10/2012 12-5.5C</p>	<p>Transition from AIS to AIM and eventually SWIM</p>	<ul style="list-style-type: none"> • To achieve a uniform and efficient aeronautical information management structure, based on system wide information management, to support all phases of flight. • Improve planning and management of flights. • Improve safety. 	<ul style="list-style-type: none"> • Status of adherence to AIRAC in UAE. • Status of QMS in UAE AIS. • Status of automation in AIS in UAE. 	<ul style="list-style-type: none"> • Number of AIS related deficiencies in UAE AIS. • Status of QMS at AIS. • Status of eAIP in UAE. 	<ul style="list-style-type: none"> • Define the requirements of aeronautical KPI Metrics, MIDANPIRG Ref information databases forming part of AIM • Define the human resource requirements • Plan transitional training and recruitment • Developing requirements for competency management related to all AIM functions • Licensing or other formal means of assessment for safety related AIM functions. • Legislate the QMS requirements for AIM • Implement the QMS requirement as part of AIS certification • Support the Eurocontrol CHAIN deliverables • Incorporate meteorological data within the scope of AIM • Implement Annex 15 Amendment 33-36 e-TOD • Harmonization and integration of civil and military Aeronautical Information • Ensure that CDM is fully supported by AIM • Define how AIM can provide support to the FDM concept • Expand the means of access to Aeronautical Information
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11/2012 UAE 1/2012	Development of SMS at UAE airports and ANSPs	<ul style="list-style-type: none"> • Improve Efficiency of Aerodromes and ANSPs • Improve safety 	<ul style="list-style-type: none"> • Status of aerodromes and ANSPs' SMS documentation. 	<ul style="list-style-type: none"> • Percentage of Aerodromes and ANSPs whose SMS have been accepted by Regulator. 	
12/2012 UAE 2/2012	Develop NASAC working paper on establishment of UAE air-space management and planning organization.	<ul style="list-style-type: none"> • Improve efficiency • Reduce fuel consumption • Improve safety of route structure • Increase in airspace efficiency 	<ul style="list-style-type: none"> • Development and presentation of proposal to GCAA 		Development of proposal Acceptance of Proposal by GCAA
13/2012 UAE 3/2012	Develop UAE policy, Regulations and guidance on management of UAS activities in UAE airspace.	<ul style="list-style-type: none"> • Improve safety 	<ul style="list-style-type: none"> • Status of Policy development. • Status of Regulation development. • Status of development of guidance material. 		Prepare Regulation regarding UAS access to civil controlled airspace. Revise CAAP 16.

Schedule 3 Strategies:

short term (ST) – 2012 – 2015,

medium term (MT) – 2016-2020

long term (LT) – 2021-2030

Ongoing indicates the action crosses from one time frame into the next.

S/N	Strategic Action	Who	UAE Timeframe	Block number/Date	Status Open Review—(Yr) Closed Ongoing
1.1/2012	<ul style="list-style-type: none"> Collaborative review of military’s airspace requirements. 	Regulator, ANSP, Military	ST	0-05, -10, -35, 1-10, -25 2-05, -15, -25 3-05,	Ongoing
1.2/2012	<ul style="list-style-type: none"> Improve civil access to military airspace during low military activity periods. 	Regulator, ANSP, Military	MT	0-05, -10, -35, 1-10, -25 2-05,-15,-25, 3-05	
1.3/2012	<ul style="list-style-type: none"> Develop FUA concept to maximum level possible. 	Regulator, Military,	MT	0-05, -10, -35, 1-10, -25 2-05,-15, -25, 3-05	
1.4/2012	<ul style="list-style-type: none"> Enhance Civil Military ATS cooperation and understanding. 	ANSPs, Military	ST	0-05, -10, -35, 1-10, -25 2-05, -15, -25, 3-05	Ongoing

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1.5/2012	<ul style="list-style-type: none"> Reduce the size and hours of operation of the Danger and Restricted areas as much as possible 	Regulator, Military	MT	0-05, -10, -35, 1-10, -25 2-05,-15, -25, 3-05	
2.1/2012	Develop methods to establish demand/capacity forecasting.	Regulator, ANSPs, Airlines, Aerodromes	ST	0-35, -65, -70,	
2.2/2012	Coordinate capacity improvement plans with adjoining FIRs and liaise with ICAO (MIDANPIRG) as required.	ANSPs, Regulator	ST 2015	0-10, -20, -35, 1-35, 2-35	
2.3/2012	Queue Management (Demand and Capacity Balancing); including Arrival Management; Departure Metering; and Departure Management.	ANSPs, Aerodromes, Airlines.	ST	0-05, 15, 20, 25, 35, 80 1-05, 15, 25, 35, 80 2-05, 15, 25, 35, 3- 15,	
2.4/2012	Continue to increase capacity ahead of demand based on regular and accurate demand/capacity forecasting.	ANSPs, Aerodromes, Airlines.	MT	0-05, 15, 20, 25, 35, 80 1-05, 15, 25, 35, 80 2-05, 15, 25, 35, 3- 15,	
3.1/2012	Development of UAE Airspace Concept based on PBN Implementation Plan.	Regulator, ANSPs.	ST	0-05, 10, 1-05, 10.	Ongoing
3.2/2012	Plan for the introduction of civil access to/from military airspace within the Western Region of the Emirate of Abu Dhabi.	Regulator, UAE Military, ANSPs.	ST	0-05, 10, 1-05, 10.	Ongoing

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3.3/2012	Identify and analyse traffic flow problems and develop methods for improving efficiencies.	Regulator, ANSPs, Airlines, Aerodromes.	ST	0-35, -65, -70,	Ongoing
3.4/2012	Develop point to point navigation including UPRs.	ANSPs, Airlines.	MT	0-05, 10, 20, 1-05, 102-05	
3.5/2012	Introduce CDO and CCD.	Regulator, ANSPs, Airlines.	ST	0-05, 20 1-05. 2-05	
3.6/2012	Continue to increase capacity ahead of demand based on regular and accurate demand/capacity forecasting.	Airlines, ANSPs, Aerodromes.	MT	0-05, 15, 20, 25, 35, 80 1-05, 15, 25, 35, 80 2-05, 15, 25, 35, 3- 15,	
3.7/2012	Review ATS Contingency plans in coordination with adjoining FIRs and ICAO.	ANSPs, Regulator.	ST	0-40	
4.1/2012	Development of UAE Airspace Concept based on PBN Implementation Plan.	Regulator, ANSPs.	ST	0-05, 10, 1-05, 10.	Ongoing
4.2/2012	Plan for the introduction of civil access to/from military airspace within the Western Region of the Emirate of Abu Dhabi.	Regulator, UAE Military, ANSPs.	ST	0-05, 10, 1-05, 10.	Ongoing
4.3/2012	Identify and analyse traffic flow problems and develop methods for improving efficiencies.	Regulator, ANSPs, Airlines, Aerodromes.	ST	0-35, -65, -70,	
4.4/2012	Develop point to point navigation including UPRs.	ANSPs, Airlines.	ST	0-05, 10, 20, 1-05, 10 2-05	Ongoing

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4.5/2012	Introduce CDO and CCD.	Regulator, ANSPs, Airlines.	ST	0-05, 20 1-05. 2-05	
4.6/2012	Continue to increase capacity ahead of demand based on regular and accurate demand/capacity forecasting.	Airlines, ANSPs, Aerodromes.	MT	0-05, 15, 20, 25, 35, 80 1-05, 15, 25, 35, 80 2-05, 15, 25, 35, 3- 15,	
4.7/2012	Review ATS Contingency plans in coordination with adjacent units and ICAO.	ANSPs, Regulator.	ST	0-40	
5.1/2012	Development of UAE Airspace Concept based on PBN Implementation Plan.	Regulator, ANSPs.	ST	0-05, 10, 65 1-05, 10, 65	
5.2/2012	Design and implement RNP APCH with Baro-VNAV in accordance with the UAE PBN Implementation Plan.	Regulator, ANSPs.	MT	0-05, 65 1-05, 65	
5.3/2012	Design and implement RNP AR APCH procedures where required.	Regulator, ANSPs.	MT	0-05, 65 1-05, 65	
6.1/2012	Confirm Strategy for the implementation of GNSS within the UAE.	Regulator and ANSPs.	ST	0-05, 10, 20, 35, 65 1-05, 10, 35, 65 2-05, 35,	Ongoing
6.2/2012	Improve SSR Code Management.	Regulator, ANSPs.	ST	Nil	
6.3/2012	Improve 5 Letter Code allocations and review of fix naming policy.	Regulator, ANSPs.	ST	Nil	
6.4/2012	Review Radio Spectrum Management and processes to protect the aeronautical spectrum	Regulators (GCAA and TRA)	MT	Nil	

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6.5/2012	Review and improvement of communication infrastructure related to ATN implementation	ANSPs, Regulator	ST	0-25, 30, 40, 80 1-25, 30, 40, 80 2-25	Ongoing
6.6/2012	Implementation of advanced technologies to support data link services.	Regulator, ANSPs.	MT	0-30, 40, 80 1-30, 40, 80	
6.7/2012	Phase out terrestrial navigation aids which are not required for precision approach procedures.	ANSPs.	ST	0-05, 10, 20 1-05, 10	Ongoing
6.8/2012	Develop protocols for single ANSP	ANSPs	ST 2015		
7.1/2012	Improve ATM Situational Awareness, including Surveillance Infrastructure (Multilateration; ADS-B; etc.)	ANSPs, Regulator, Aerodromes	ST	0-35, 40, 75, 100, 1-35, 40, 75, 2-35, 75, 100	Ongoing
8.1/2012	Meet ICAO timetable for introduction of new IFPL	GCAA and Regulator	11/2012	Nil	
9.1/2012	Annual Evaluation aerodrome infrastructure to accommodate fleet changes.	Aerodromes and Regulator	ST 2012	0-15, 75, 1-15, 75 2-15, 75 3-15	Ongoing
9.2/2012	Implement aerodrome infrastructure changes to accommodate fleet changes.	Aerodromes	MT 2020	0-15, 75, 1-15, 75 2-15, 75 3-15	
9.3/2012	Maximise Aerodrome capacity in all weather conditions according to the Airport Capacity Enhancement – ACE principles defined by Eurocontrol.	Aerodromes, ANSPs.	MT	0-15, 75, 1-15, 75 2-15, 75 3-15	

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9.4/2012	Improve safety of aerodrome operations.	Aerodromes, ANSPs.	ST	0-15, 20, 25, 40, 65, 70, 75, 100 1-15, 25, 40, 65, 70, 75, 105, 2-15, 25, 70, 75, 100,	Ongoing
9.5/2012	Improve runway incursion prevention according to the European Action Plan for the Prevention of Runway Incursions - EAPPRI.	Aerodromes, ANSPs.	MT	0- 40, 75, 1-40, 75 2-75	

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Schedule 4 Activities:

S/N	Strategic Action Activity	Organisation	Target date/ Complete	Block reference/date	Reference
2.1/2012	Develop methods to establish demand/capacity forecasting.	ANSP, Airline, Aerodrome, Regulator		0-35, -65, -70,	
a	Establish protocols for forecasting methodology				
b	Establish means of predicting short term peaks				
c	Measure capacity v demand on agreed periodicity				
d	Scheduling v capacity conflict management				
etc					
2.2/2012	Coordinate capacity improvement plans with adjoining FIRs and liaise with ICAO (MIDANPIRG) as required.	ANSPs, Regulator			
2.3/2012	Queue Management (Demand and Capacity Balancing); including Arrival Management; Departure Metering; and Departure Management.	ANSPs, Aerodromes, Airlines.			

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2.4/2012	Continue to increase capacity ahead of demand based on regular and accurate demand/capacity forecasting.	ANSPs, Aerodromes, Airlines.			
3.1/2012	Development of UAE Airspace Concept based on PBN Implementation Plan.	Regulator, ANSPs.			
3.2/2012	Plan for the introduction of civil access to/from military airspace within the Western Region of the Emirate of Abu Dhabi.	Regulator, UAE Military, ANSPs.			

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3.3/2012	Identify and analyse traffic flow problems and develop methods for improving efficiencies.	Regulator, ANSPs, Airlines, Aerodromes.			
3.4/2012	Develop point to point navigation including UPRs.	ANSPs, Airlines.			
3.5/2012	Introduce CDO and CCD.	Regulator, ANSPs, Airlines.			
3.6/2012	Continue to increase capacity ahead of demand based on regular and accurate demand/capacity forecasting.	Airlines, ANSPs, Aerodromes.			

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3.7/2012	Review ATS Contingency plans in coordination with adjoining FIRs and ICAO.	ANSPs, Regulator.			
4.1/2012	Development of UAE Airspace Concept based on PBN Implementation Plan.	Regulator, ANSPs.			
4.2/2012	Plan for the introduction of civil access to/from military airspace within the Western Region of the Emirate of Abu Dhabi.	Regulator, UAE Military, ANSPs.			

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4.3/2012	Identify and analyse traffic flow problems and develop methods for improving efficiencies.	Regulator, ANSPs, Airlines, Aerodromes.			

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