Air Navigation Projects in OMAN

الهيئة العامة للطيران المدني
Public Authority for Civil Aviation

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Future Air Navigation Systems

As part of the Muscat & Salalah Airports project, two special packages were dedicated for the purpose of improving the ANS services within the Oman FIR (Flight Information Region).

Objectives of the Project

Developing a seamless, globally coordinated system of air navigation services that will cope with worldwide growth in air traffic demand while improving upon the present levels of :

- **Air Traffic :**
  - Safety of Air Navigation,
  - Regular, Efficient and Economical operation of air services,
  - Availability of user preferred Flight Schedules & Profiles.
- **Airspace & Airports :**
  - Efficiency,
  - Capacity.
- **ATM Systems :**
  - System Harmonization : Minimizing differing equipment carriage requirements between regions,
  - Nationwide Standardization,
  - Operation and Maintenance Cost Reduction.

Oman Map : Airport Locations

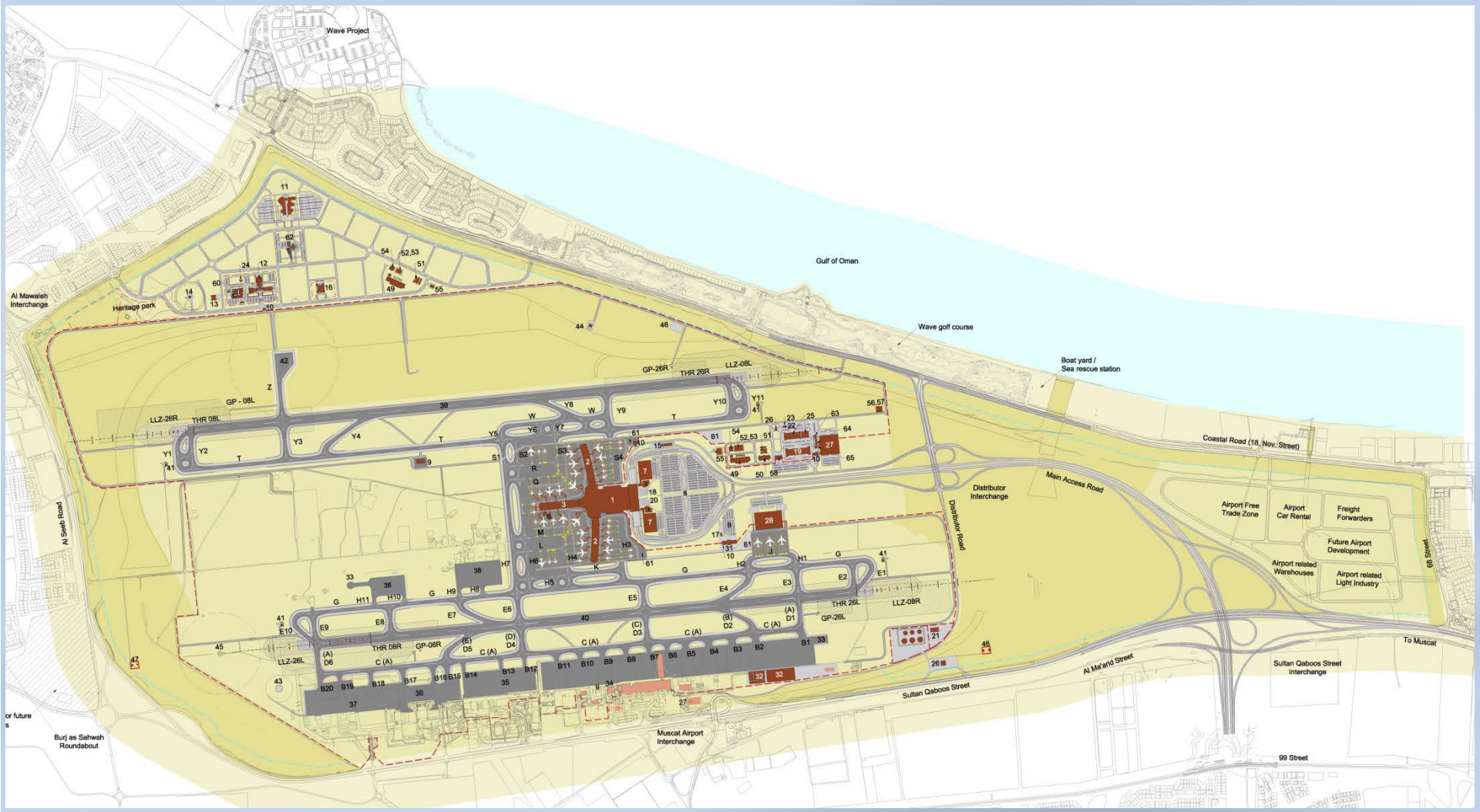
Target Airport Capacity

- Developing Muscat Intl Airport : 12, 24, 36 & 48 MPax (4 Development phases).
- Developing Salalah Airport : 1 MPax.
- Building 4 new Regional Airports : Adam, Sohar, Ras Al Had, Duqum.
- First Phase Total capacity : 14 MPax
- 5 Coastal Airports + 1 Interior Airport

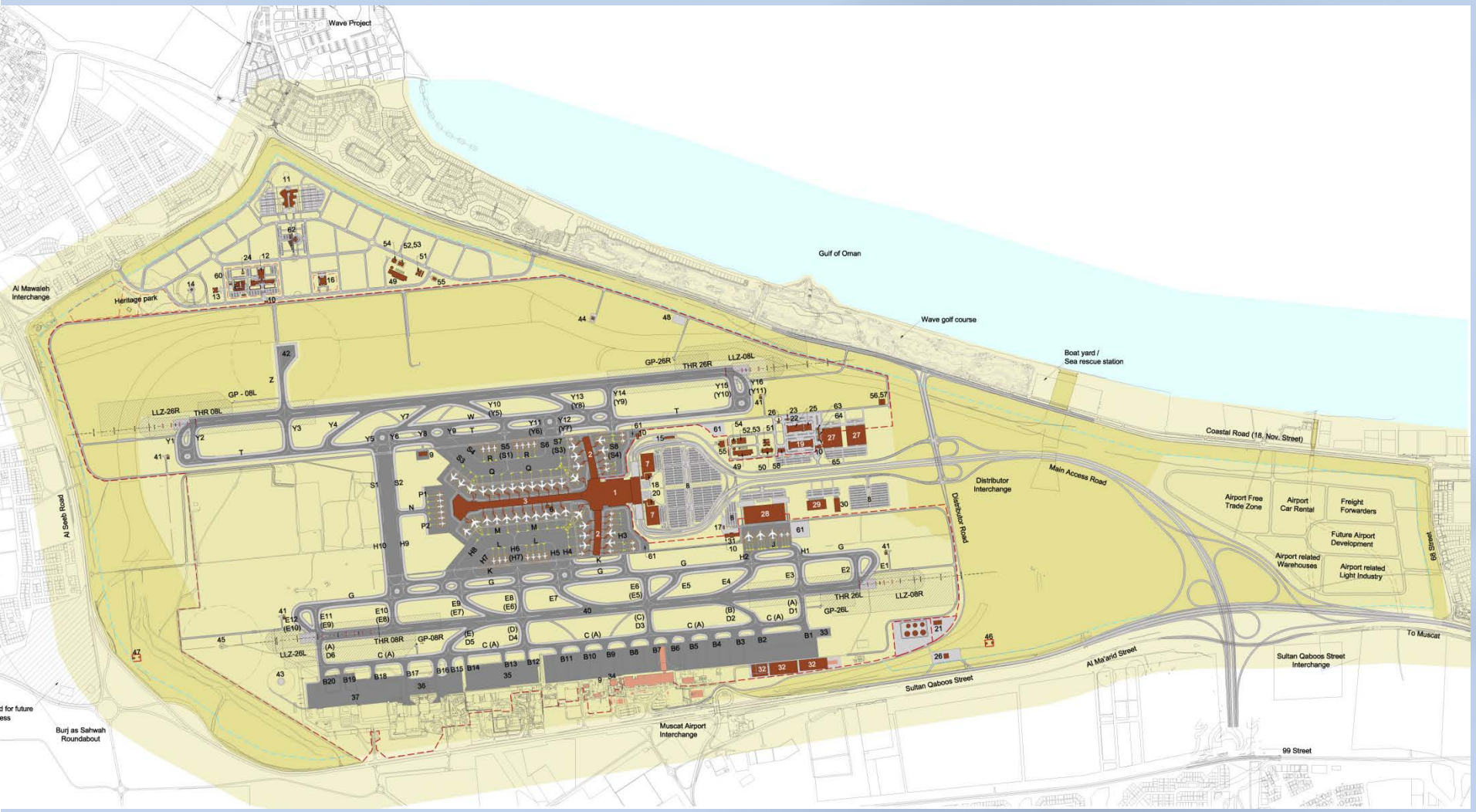
Development of Oman Airports

	Muscat	Salalah	Sohar	Ras Al Had	AL Duqum	Adam
PTP Capacity (Million Pax)	12 , 24 ,36 48	1	0.5	0.5	0.5	0.25
Expected Opening date	End 2014 (Phase 1 A)	End 2014	TBA	TBA	TBA	TBA
Operator	OAMC : Oman Airport Management Company					
ANSP	DGMAN : Directorate General of Meteorology & Air Navigation					
Airport Category	4F	4F	4F	4F	4F	4F
Location						
Runway dimensions	4000 x 60 m 2 Para. RWY	4000 x 60 m	4000 x 60 m	4000 x 60 m	4000 x 60 m	4000 x 60 m
Gateway	30	16	1	0	2	1
Ramp (Apron)	30	16	1 VIP	0	2	1 VIP
A/C Remote Stands	25	4 Cargo	4	4	2	4
ILS Approach	Operation : Precision Approach Cat. I Performance : ILS Cat II					
Safety Level	10	10	10	10	10	10

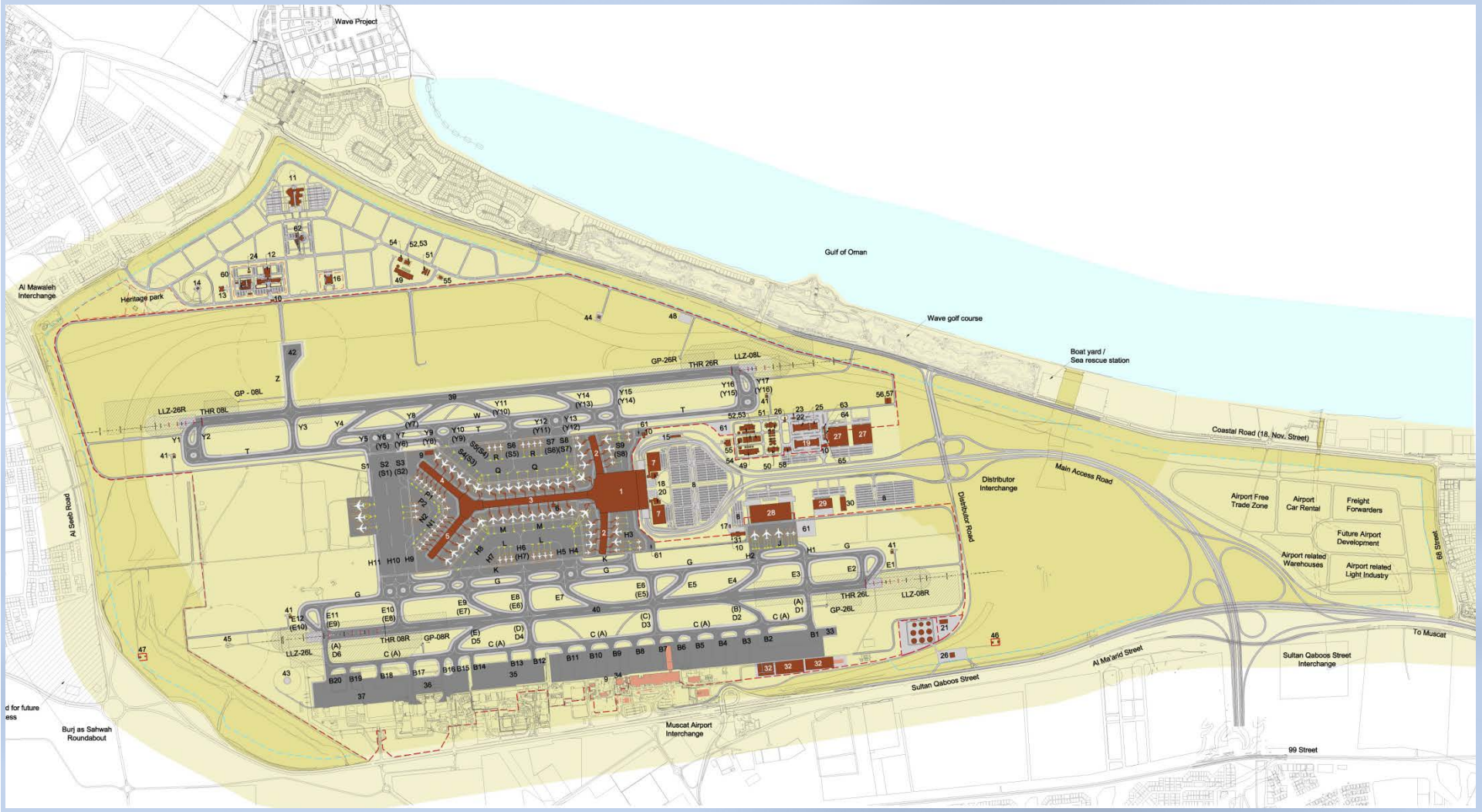
Muscat : Airport Layout Plan 12 MPax



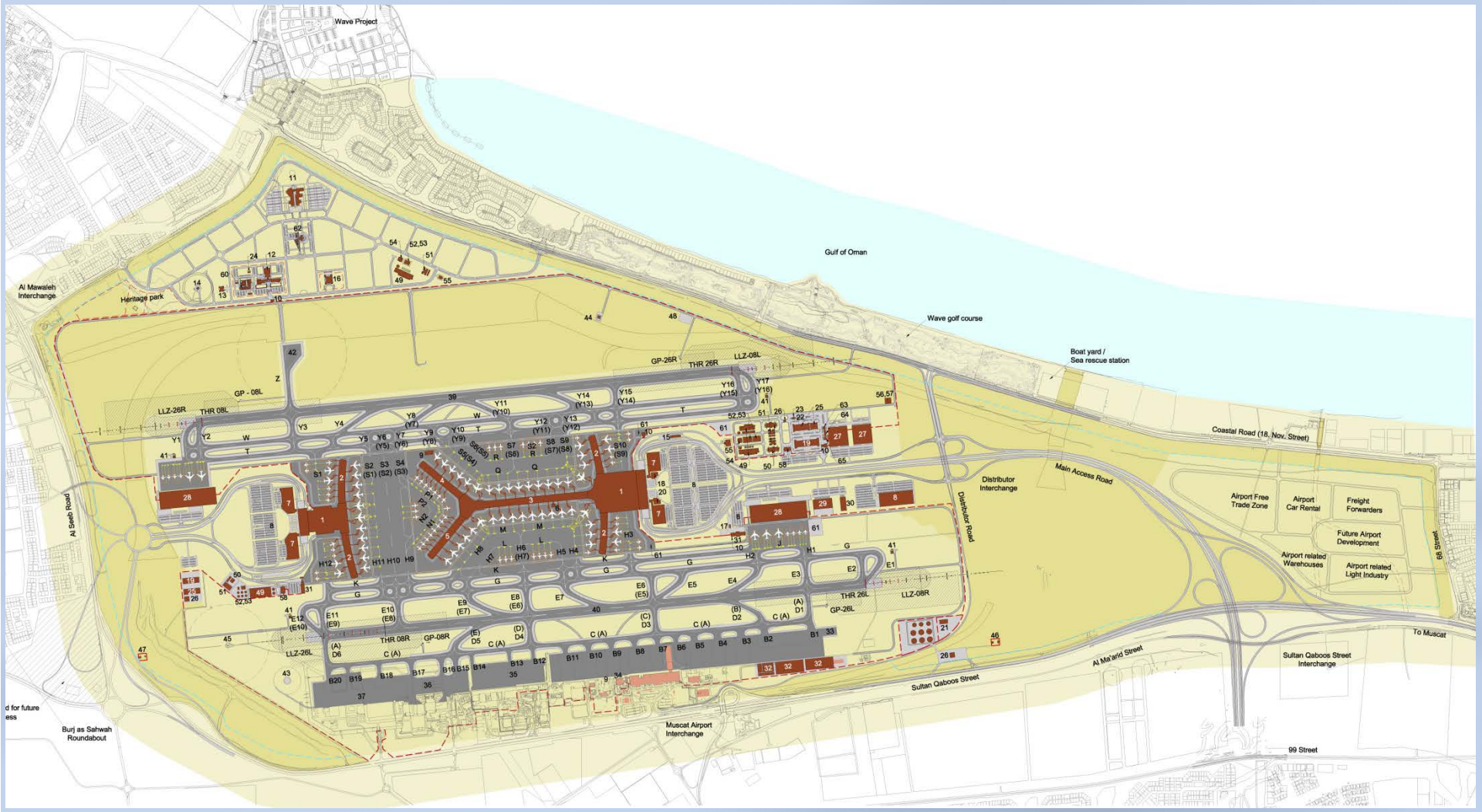
Muscat : Airport Layout Plan 24 MPax



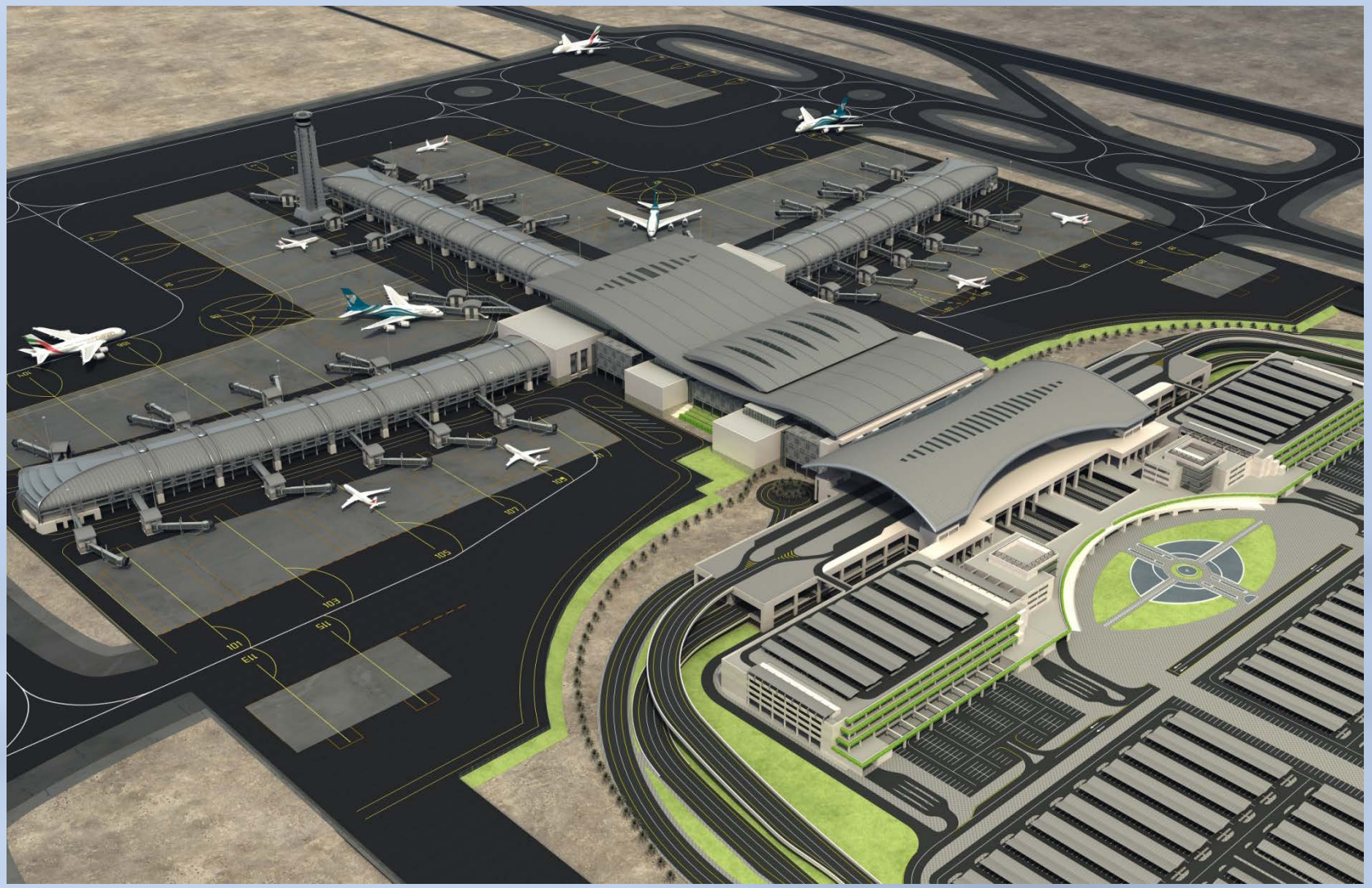
Muscat : Airport Layout Plan 36 MPax



Muscat : Airport Layout Plan 48 MPax



Muscat Airport Aerial View 12 MPax



Muscat : Future Main ATM Facilities

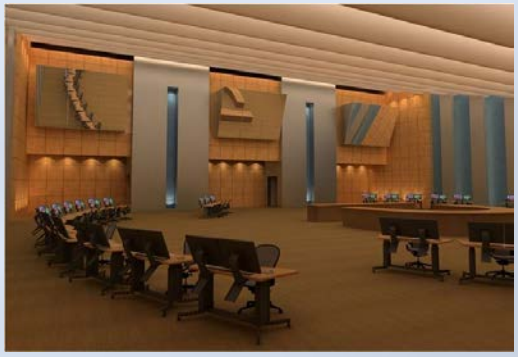
ATCT

H : 97 m

T.A. : 2,871 m^2

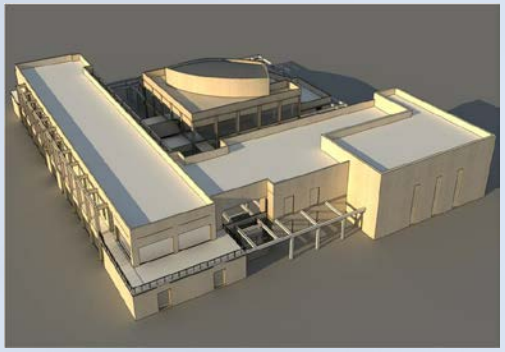
ATM COMPLEX

T.A. : 14,813 m^2



ACC : 600 m^2

CTC



T.A. : 4,986 m^2

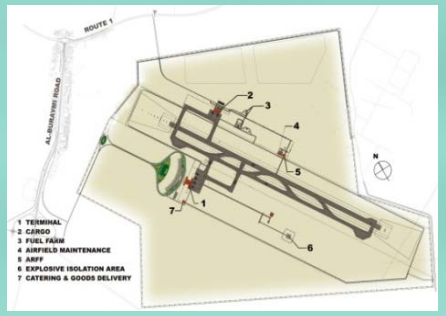
TWR SIM : 1,662 m^2

Salalah : Aerial View

Regional Airports

Sohar

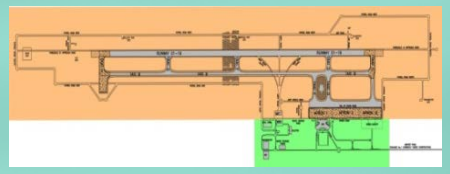
Cap. : 500,000 PAX
RWY : 4000 x 60 m
ATCT : 41 m



Expect. Opening Date : 05/2013

Ras Al Had

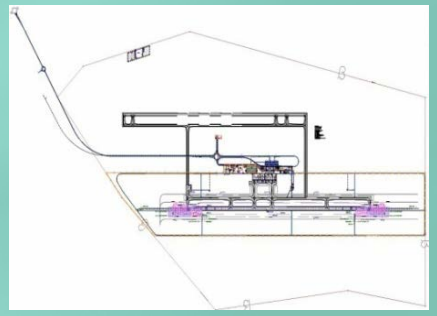
Cap. : 500,000 PAX
RWY : 4000 x 60 m
ATCT : 43 m



Expect. Opening Date : 09/2013

Al Duqum

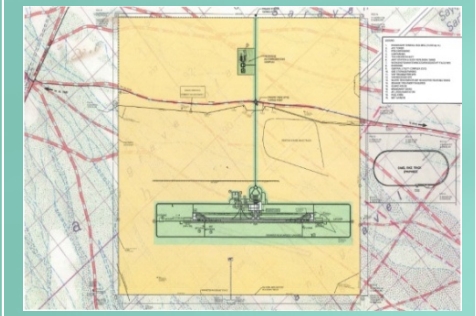
Cap. : 500,000 PAX
RWY : 4000 x 60 m
ATCT : 38 m



Expect. Opening Date : 09/2013

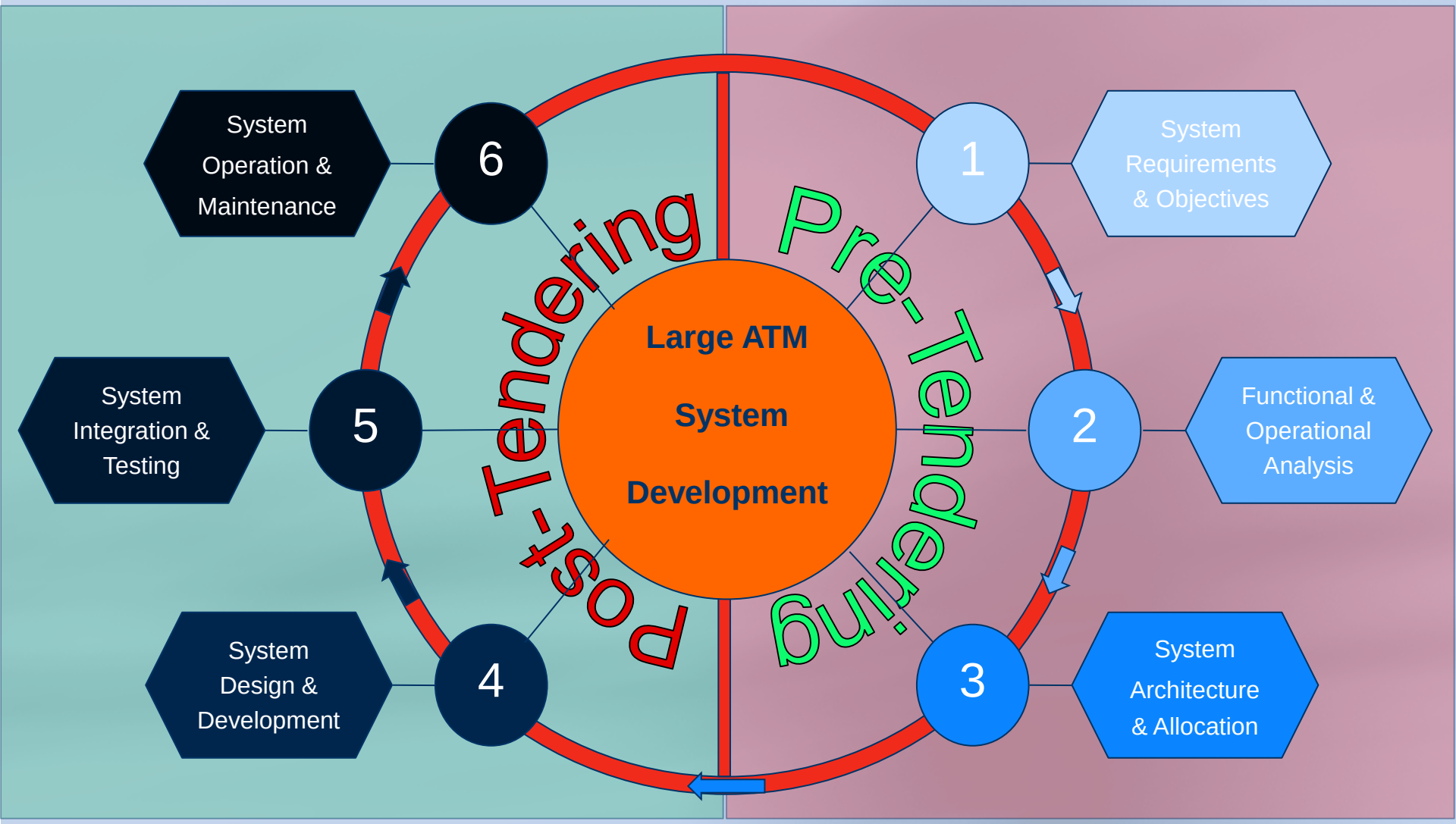
Adam

Cap. : 250,000 PAX
RWY : 4000 x 60 m
ATCT : 25 m



Expect. Opening Date 12/2012

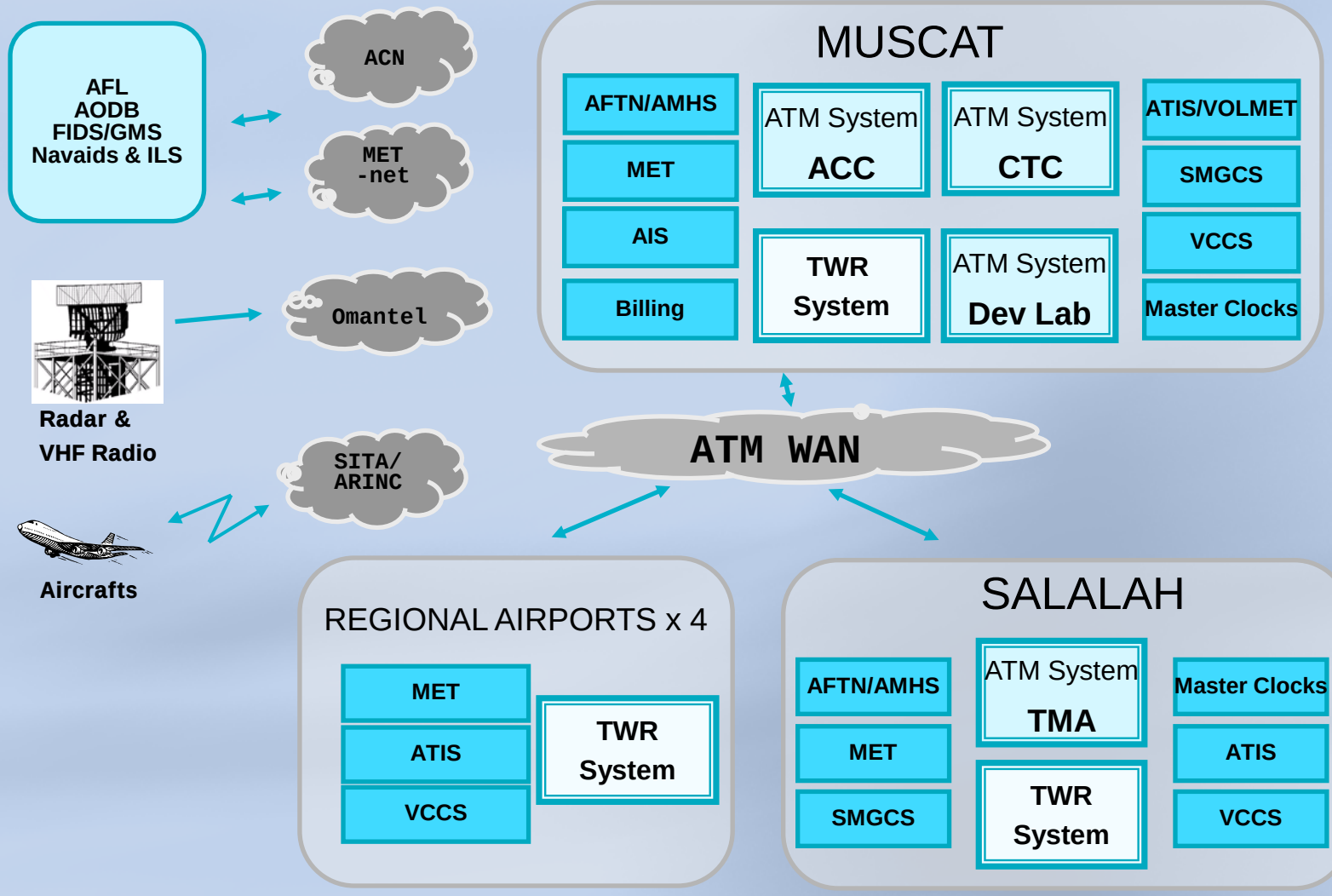
Project Phases



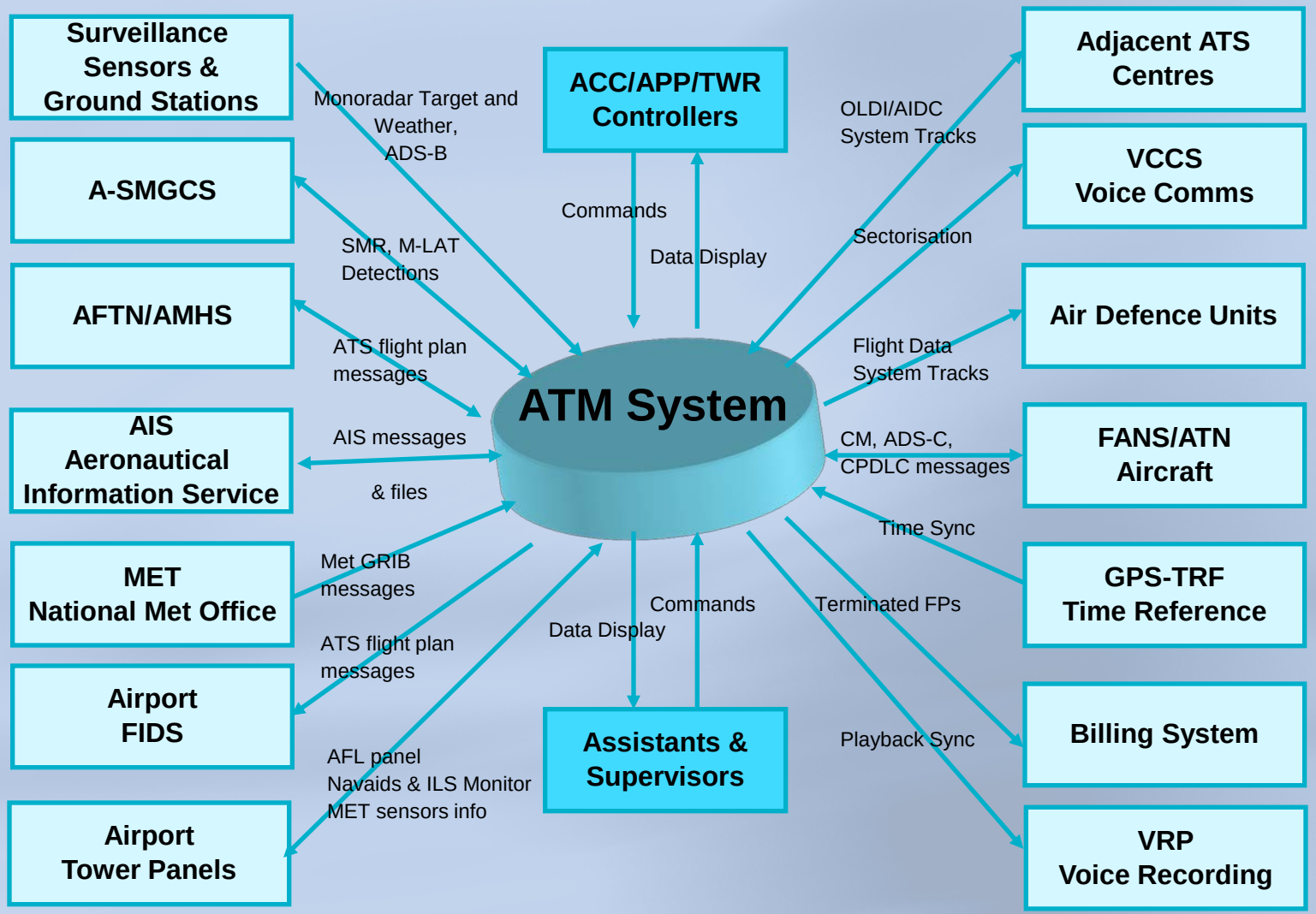
Scope Of Supply : CNS/ATM Systems

SYSTEM	FUNCTION	SITE
ATC Automation System	Surveillance data Processing and Display System	All Airports
VCCS & VHF radios	Ground/Air & Ground/Ground Comm.	All Airports
AFTN/AMHS/AIS	Aeronautical Information and Message Processing and Display System.	All Airports
ATIS/VOLMET Systems	**ATIS** : Broadcast essential information (Met. Info., App. Procedure, Runway In Use, Notam ….) **VOLMET** meteorological information for aircraft in flight (Enroute)	ATIS : All Airports VOLMET : MCT
A-SMGCS	Advanced Surface Movement Guidance and Control System (SMR+ MLAT)	Muscat, Salalah
Recording System	ATM data and Voice Recording	All Airports
ATC & Tower Simulators	Ab-initio & Refresh ATCO Trainings + ATC Procedure Validation	Muscat, Salalah
Billing System	Flight Information Collect ion and Processing for aeronautical billing	Muscat
Fiber Optic & Microwave	Connect different ATM/ATC facilities to the ATM Complex	FOC: All Airports MW: Muscat & Salalah
Global Monitoring & Control Systems	Centralize the Control of all ATM systems	All Airports
Wide Area Network	Connect all Airports to Muscat for RMM	All Airports
Met Systems	Provide General and Aeronautical Meteorological Information .	All Airports
NAVAIDS	Cat II ILS (Localizer, Glide Path, Low Power DME) , D-VOR/ High Power DME	MCT + Sal : All RWY THRs Reg. Airports : Main RWY THR

CNS/ATM Systems: Overall View



CNS/ATM Systems: Interaction



ATM Automation System Functions

1. SDP :

- Single & Multi Radar Processing, Multi sensor Data Fusion : MLAT, ADS-B, Radars, WAM, SMR, PSR weather data.
- Safety Nets, RVSM, MTCD, Adherence Monitoring

2. FDP :

- Flight Data Processing,
- FPL Associated Messages,
- OLDI & AIDC Messages,
- AFTN Interface.

3. DLS :

- ADS-C Reports,
- CPDLC Messages
- SITA / ARINC Routing.
- DCL/DATIS

4. Data Recording & Playback :

- Air Situation Display Recording,
- Playback,
- Time Synchronization with Voice,
- Archiving.

5. Direct Radar Access (Bypass) :

- SDP Bypass Mode,
- Single Radar Processing,
- Sensor Selection.

6. System Time Synchronization :

- Dual GPS Receiver,
- Network Time Protocol,
- Node Time Update.

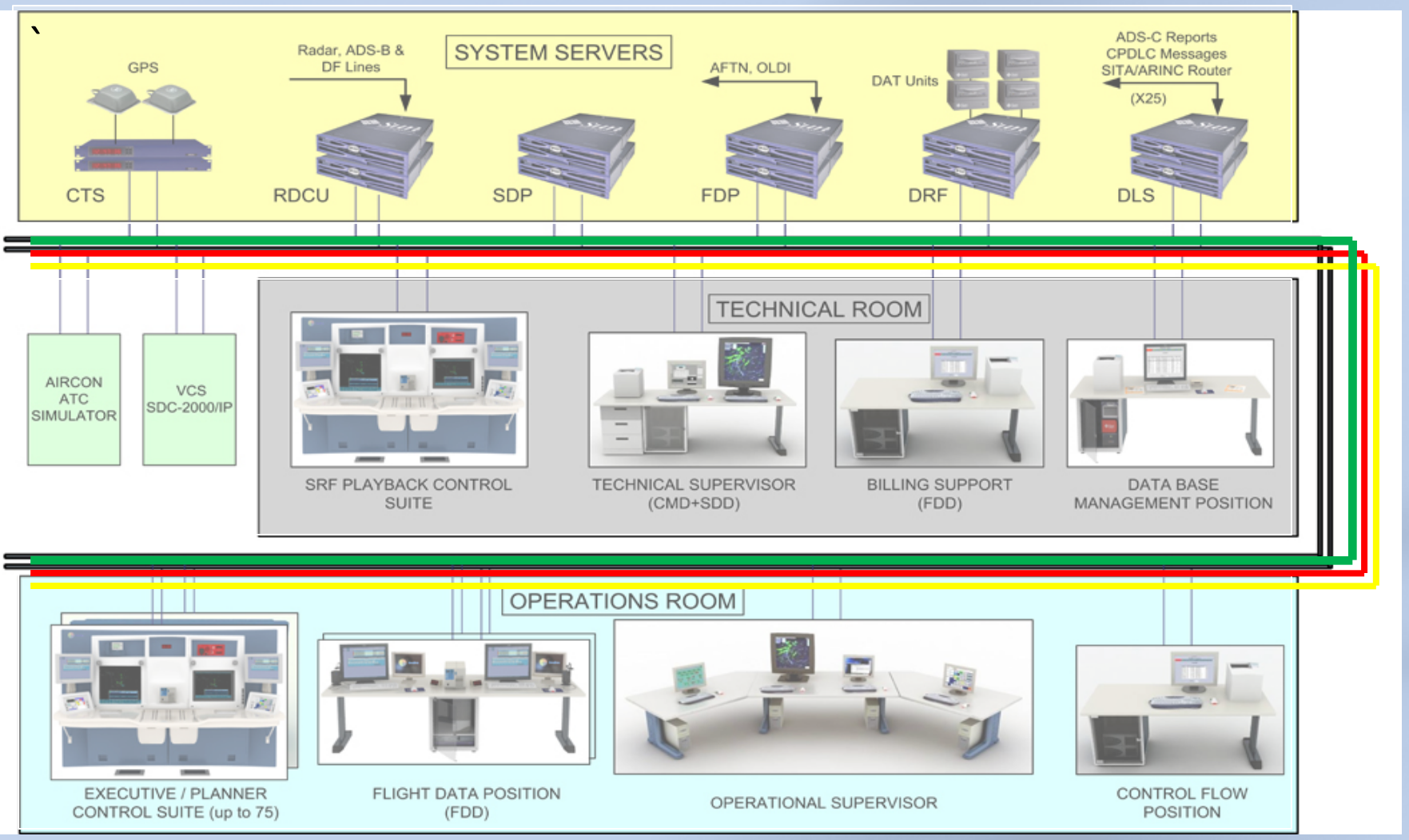
7. CWP :

- Air Situation Display,
- SDP HMI
- Track Manual Update.

8. Flight Data Operator:

- FPL List / Retrieve,
- FDP HMI
- FPL Manual Update,

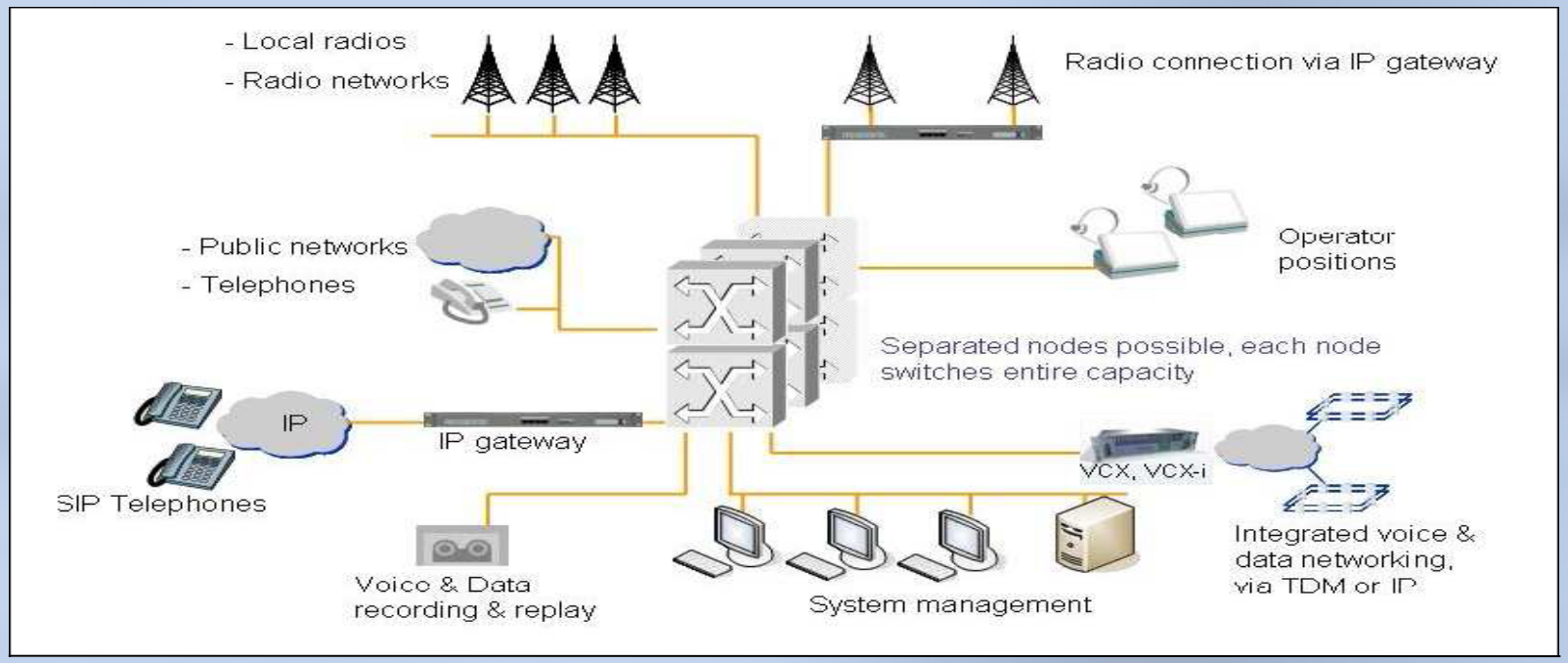
ATM Automation System Functions



VCCS : Voice Communications Control System

Main features

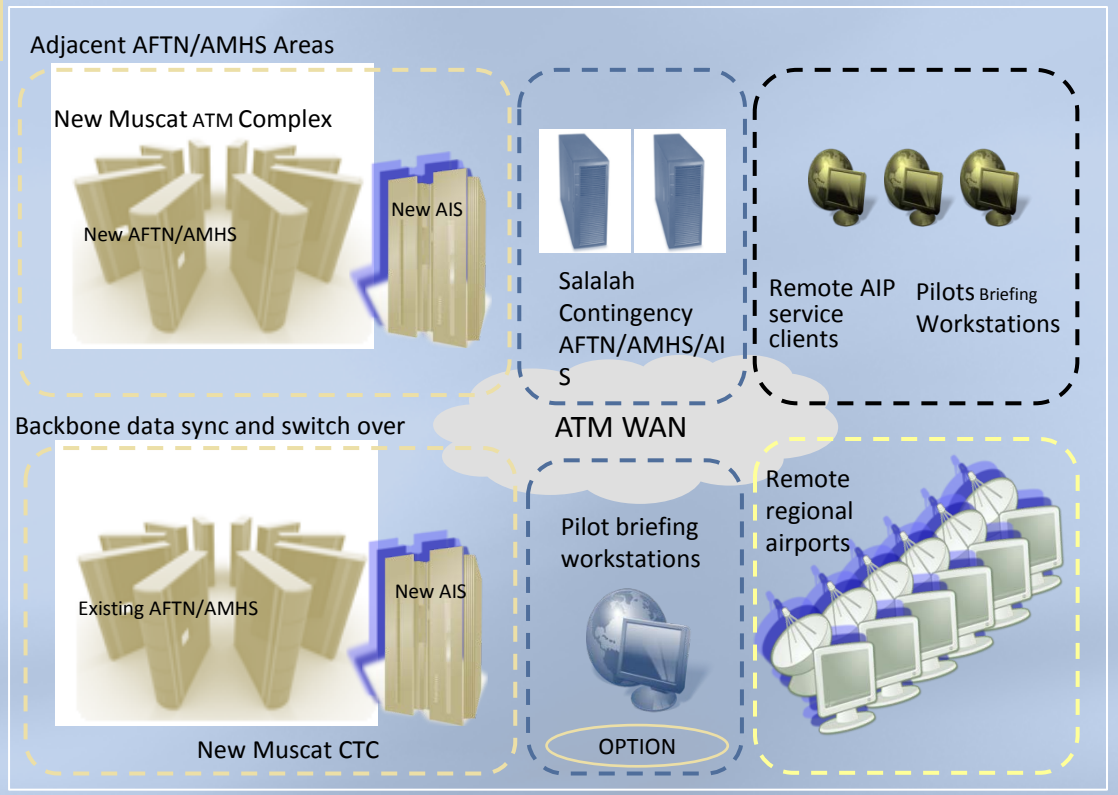
- 11 VCCS
- More than 140 Operator Positions
- 146 Radio Transceivers : Main Systems
- 25 Radio Transceivers : Standby systems .

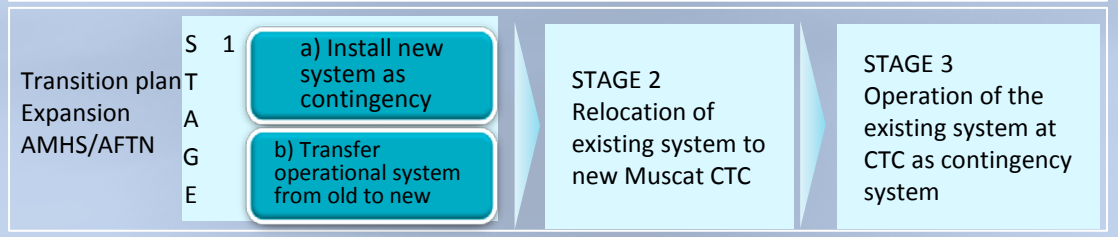


AFTN / AMHS / AIS (AIM)

Main Features

- The solution maintains today's AFTN/AMHS DGMAN system operative as the Contingency System at Muscat CTC
- A new AFTN/AMHS system is installed at Muscat New ATM Complex and Salalah ATM Complex
- New AIS systems installed at Muscat ATM Complex and CTC
- Client position at each DGMAN facility
- Smooth AFTN to AMHS transition
- Very high overall availability
- Highest integration level allowing AFTN and AMHS in one system
- Aeronautical Charting software
- Fully automated eAIP production (Publication on the Net www)
- Continuous database synchronization between main and contingency sites
- Automatic switchover in case of disaster

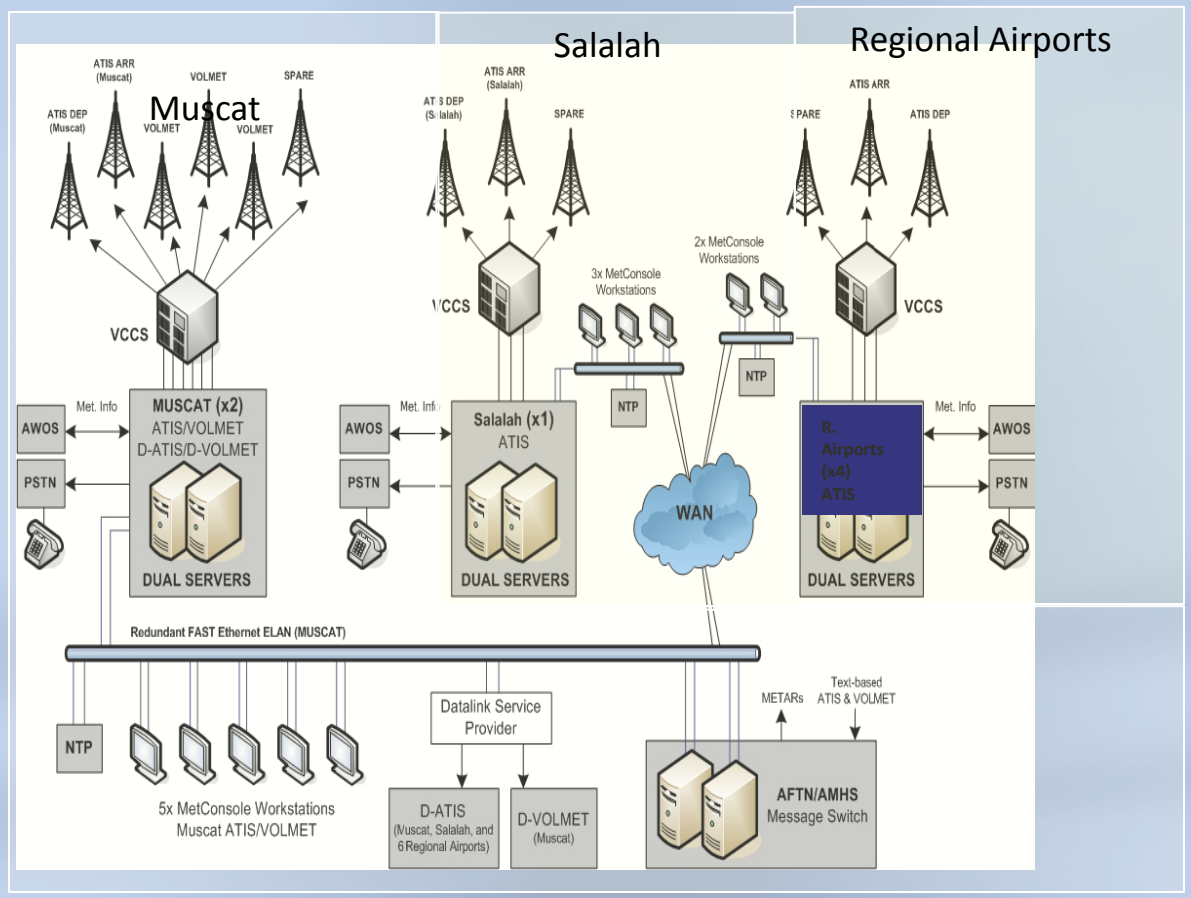




ATIS / D-ATIS / VOLMET / D-VOLMET

Main Features

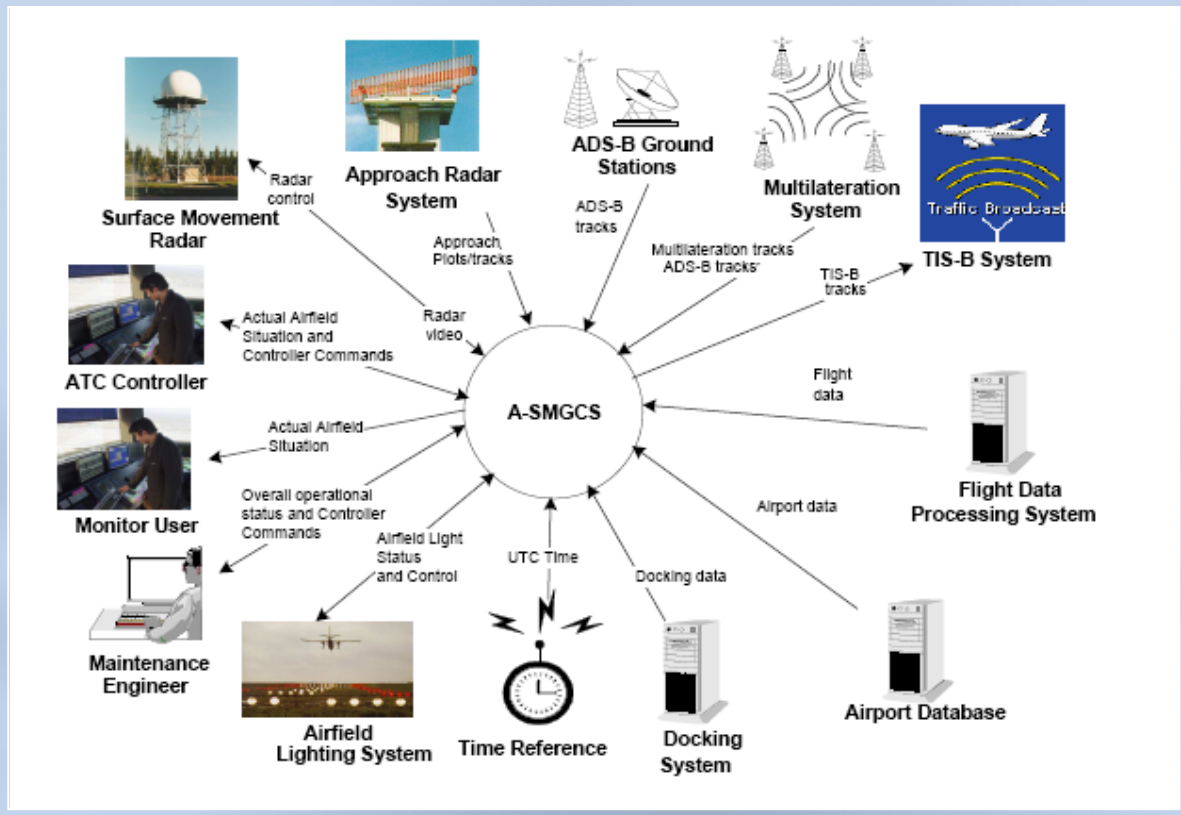
- ATIS/VOLMET and D-ATIS/D-VOLMET complete system for the Muscat International Airport and Muscat CTC
- ATIS system for the Salalah International Airport
- ATIS system for the Sohar, Duqum, Ras al Had, and Adam.
- Dual redundant configuration, with two servers in a hot stand-by configuration
- Continuous ATIS/VOLMET signal broadcasting
- Real-time message update when significant changes occur
- All ATIS and VOLMET reports are broadcasted through VHF transmitters via the Voice Communication Control System



A-SMGCS

Main Segments

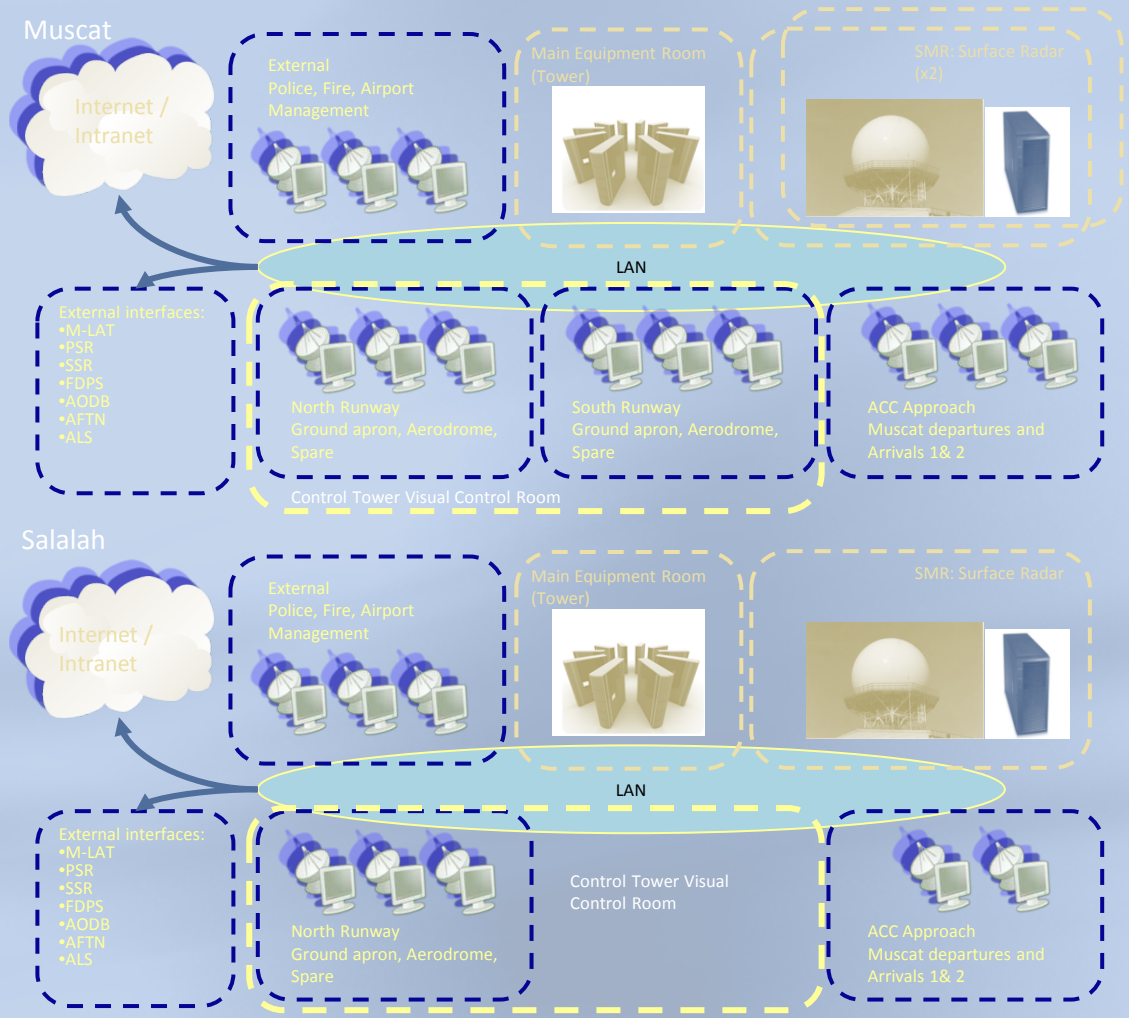
- Sensors : SMR (INDRA) , M-LAT (ERA)
- Processing & Display System : NOVA9000 (Park Air System)
- Airports : Muscat + Salalah.



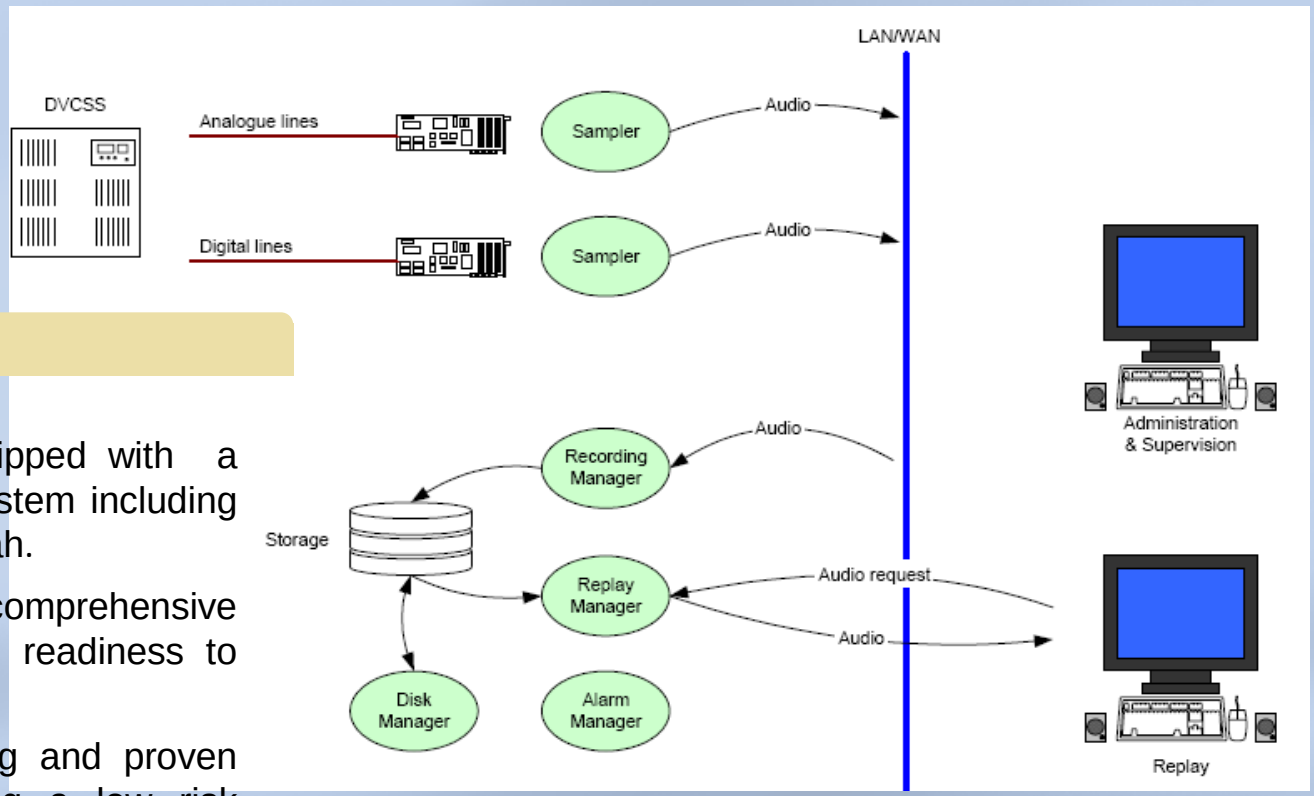
A-SMGCS

Main Features

- Three surface radars for Muscat runways (existing and projected) and Salalah runway
- Ergonomic traffic displays
- High system availability ensured through the use of dual redundant system design
- Easy maintenance through ergonomic rack space layout and special accessibility features
- Fast response to support queries through a dial-in connection



Voice Recoding & Replay System



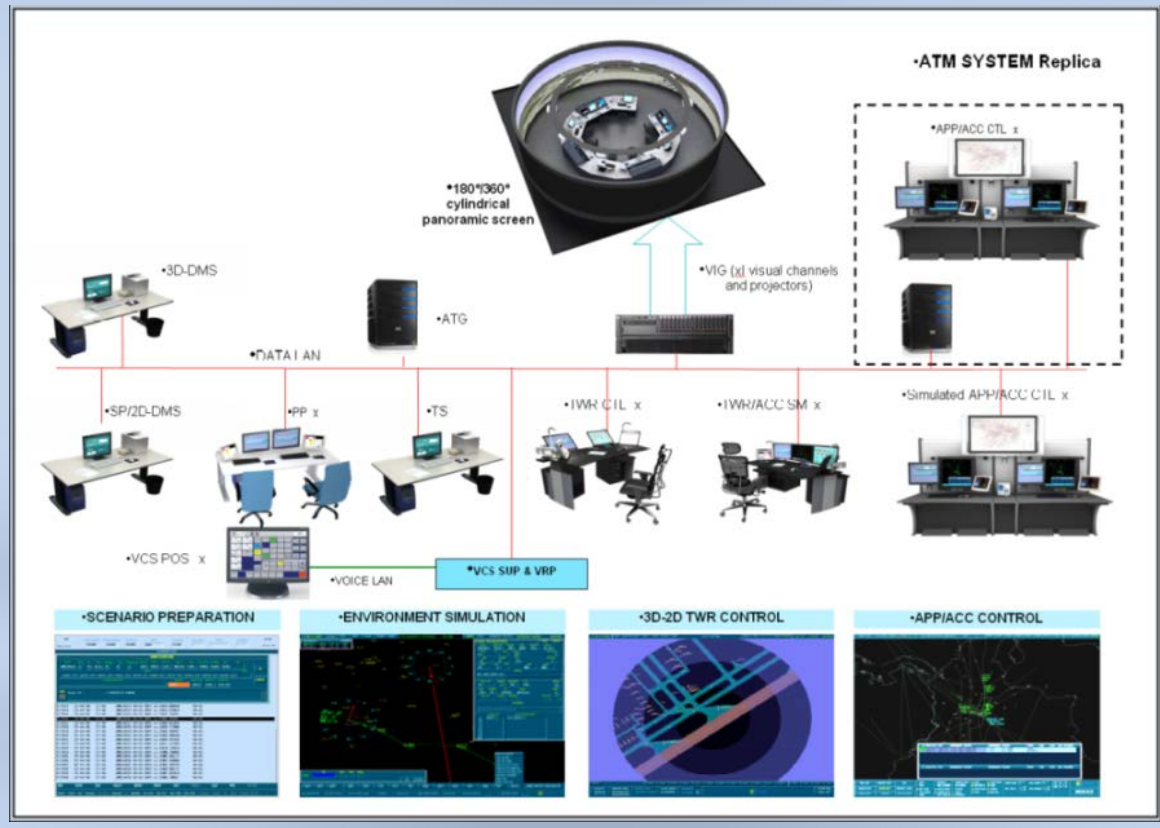
Main Features

- Each Airport will be equipped with a dual Voice Recording System including CTC in Muscat and Salalah.
- End-to-End Digital audio, comprehensive networking capability and readiness to take on future needs
- Solution proposes existing and proven COTS products, providing a low risk solution
- Integrated VHF/VCCS/Voice Recording solution through a single supplier

3/D ATC Tower Simulator

Main features

- Conceived for abs-Initio and advanced training as well as development of new Airport and Air Space methods and procedures
- Includes 3 Airdrome Tower Simulators for the Muscat Contingency & Training Centre and Salalah
- Simulator integrates :
  - Data processing and Display System (DPS): replicates and simulates operational environment
  - 3D-Aerodrome Visual Image System (VIS): image generation
  - Digital Voice and Communication Control System (VCS): Voice communications
  - Digital Voice Recording/Playback Multichannel System(VRP



3/D ATC Tower Simulator

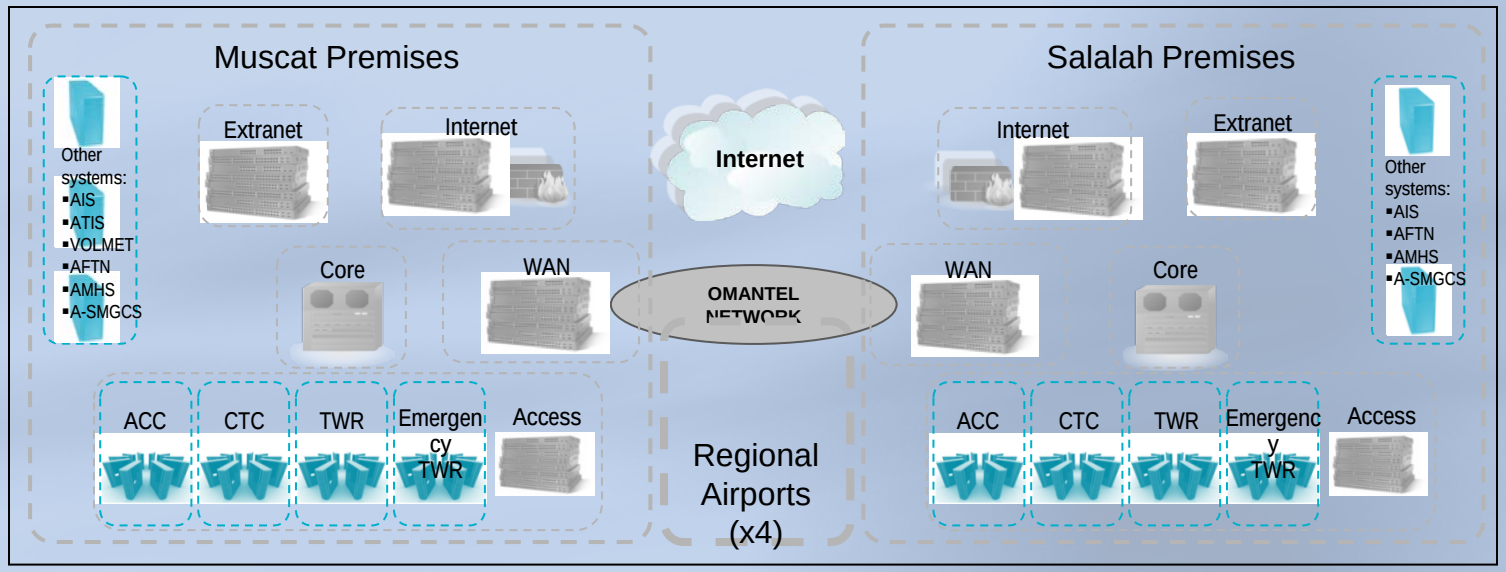
Main features

- System aims at enhancing integrated or separated training of TWR/APP/ACC Controllers
- Provides with 2D information of air/ground movements from : Radars, ADS, Flight plans, External centers , CPDLC messages, Meteorological and aeronautical info ,3/D images of aerodrome
- Simultaneous TWR/APP/ACC on 2D/3D Aerodrome and Air Space
- Three Simulators : 3/D 360 Degree, 6 Controller Positions, 4 Pseudo- Pilot, 1 Supervisor

WAN : Wide Area Network

Main features

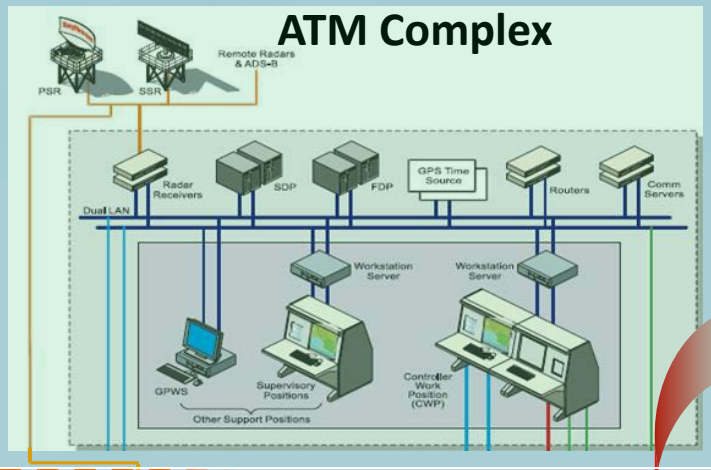
- All the network solution is based on Cisco Systems equipment
- Availability and reliability: dual redundant equipment
- Wide range of security features: encryption, firewalling, intrusion detection, access control, etc.
- Robust and efficient Multicast (as well as Unicast) distribution of the data.
- Multiservice network
- Non-proprietary solutions: the network will be build based on industry standards.



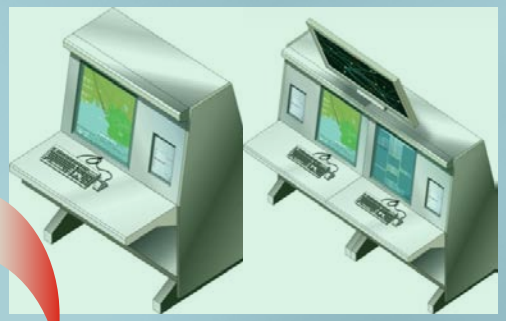
ATC Normal & Contingency Operations

Normal Operation

Contingency



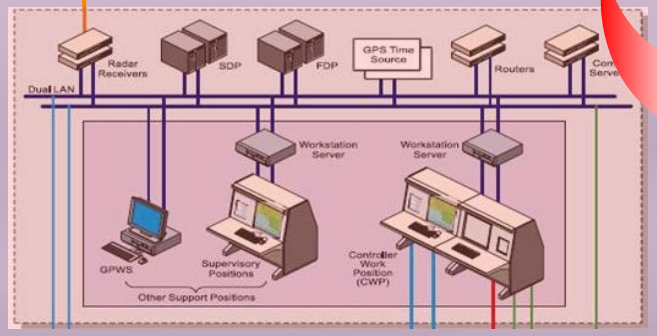
New ATC TWR



DUAL LAN

Fiber Optic

Ring



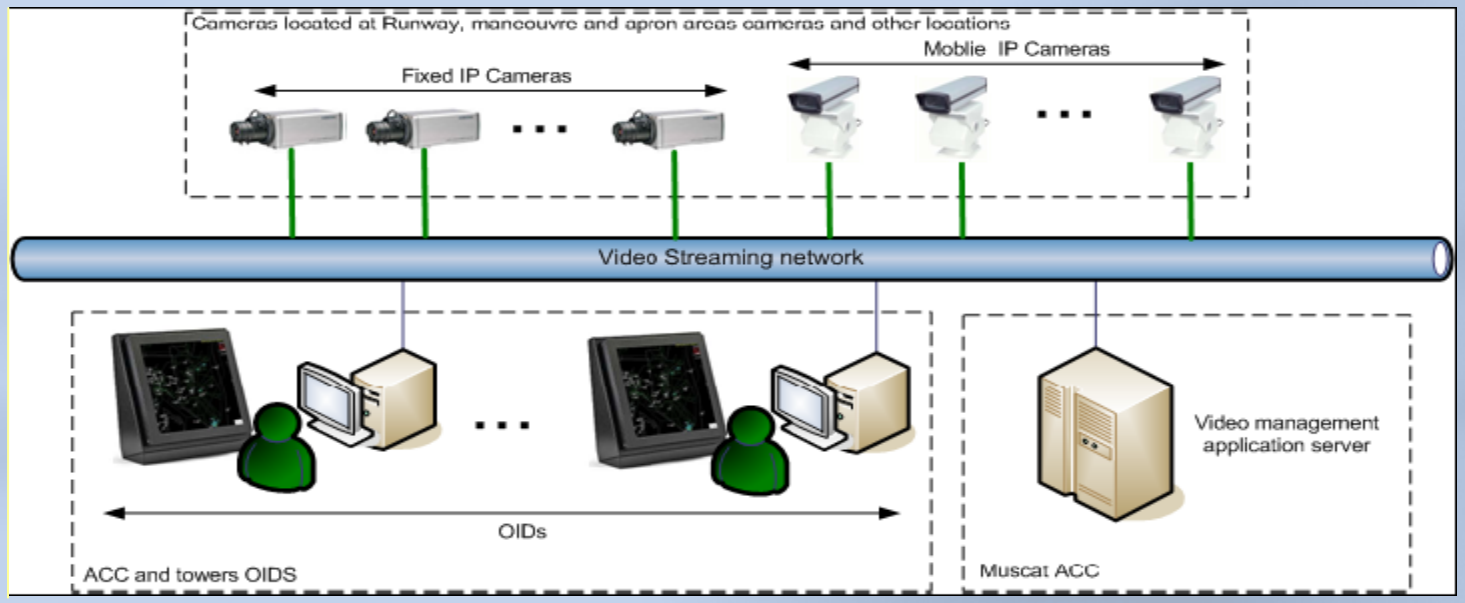
Contingency &Training Center

Existing ATC TWR

OIDS & CCTV

Main features

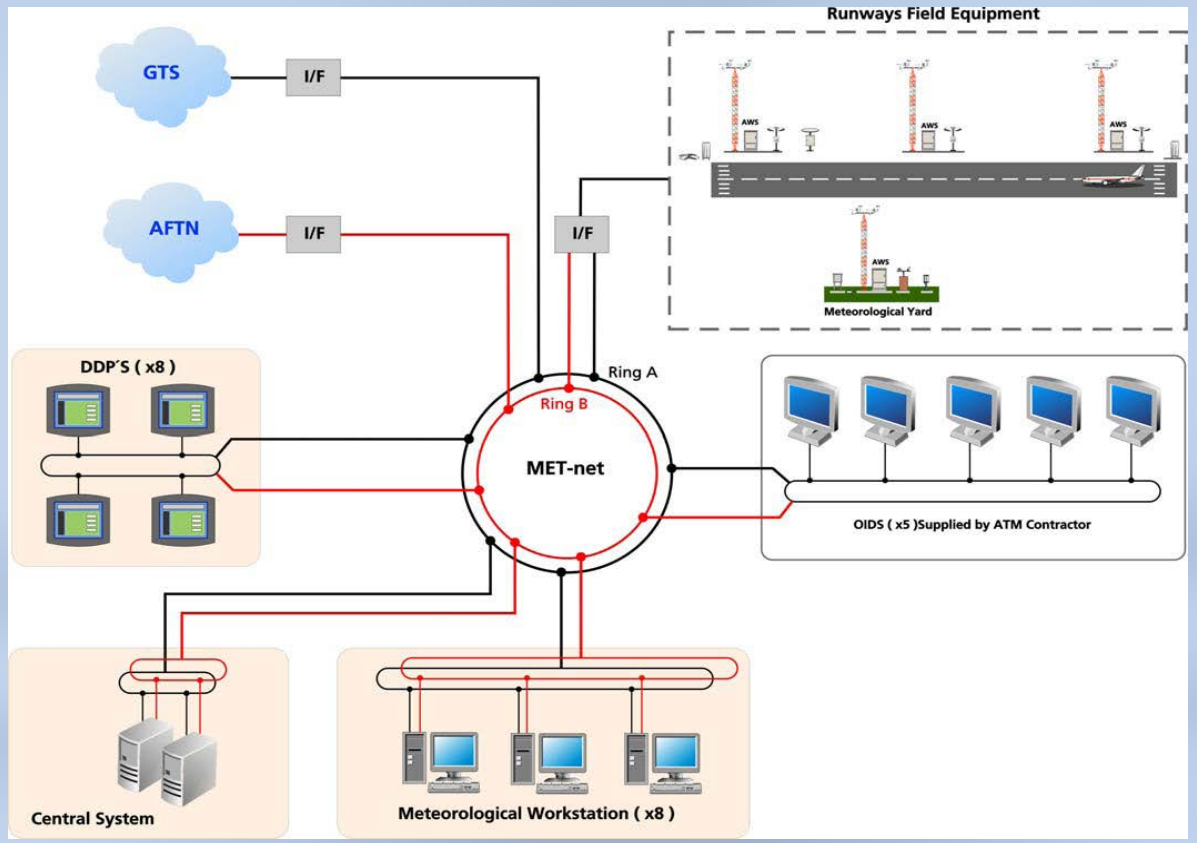
- OIDS : Operational Information Display System.
- CCTV : Closed-Circuit Television
- Provides the integration of the visualization of CCTV devices from different heterogeneous manufacturers through a single visualization interface.



Meteorological Systems

Main features

- The Meteorological Systems (MET) covers both Airport Meteorological (A-MET) and the General Meteorological (G-MET) independent Systems,
- MET Systems includes : Sensors, Processing & Display Systems
- One A-MET will be installed in each airport
- One G-MET system for Muscat
- Met Garden and full set of MET sensors in each airport
- Radar based wind profiler will be installed in each runway threshold
- Video Back Projection wall for Forecasting Center.



Navigation Aids (NAVAIDS)

Main features

- One D-VOR will be installed in each airport
- Each D-VOR will be collocated with High Power Enroute DME
- Each threshold will be equipped with Cat. II ILS (LOC, GP)
- Each Glide Path will be collocated with the GP.

PACA OMAN OFFER

PACA OMAN ARE PREPARED TO SHARE THEIR EXPERIENCE WITH ANY STATE ON ANY OF THE ANS (ATM/CNS) PROJECTS BEING IMPLEMENTED