

# **KENYA AIRSPACE MASTER PLAN 2015-2030**

**PRESENTATION TO GAP ABUJA  
19<sup>th</sup> -21<sup>st</sup> March 2019**

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- a) Deliverables
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a) Deliverables

Organizational Review and Status of Current Kenya Airspace

Economic and Financial Analysis

Preliminary Environmental Impact and Benefit Assessment

## a) Deliverables

Institutional, Legal and Regulatory Issues

Developmental Impact and Project Implementation Plan

Final Report for approval

## b) Objectives

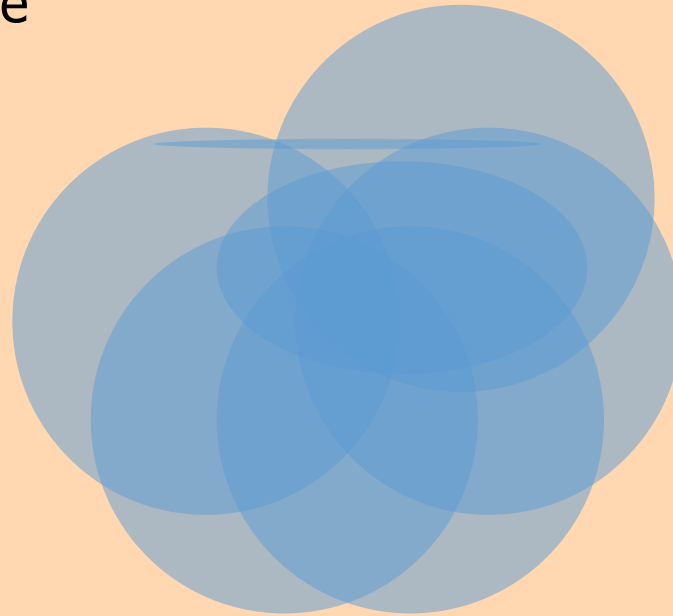
To plan evolutions and associated investments to be made by KCAA in ANS over next 15 years

To ensure consistency at global and regional levels

To be implementable

To consider Airspace Users' expectations

To anticipate any legal/regulatory issue



To ensure consistency of planning with other major stakeholders (Airport SVC Provider, Airline Operators)

To take account of the current situation in Kenya (strengths, weaknesses, ongoing projects)

## b) Objectives: Global and Regional consistency

ICAO Doc 9750 GANP 4<sup>th</sup> Edition (ASBUs) 4 Blocks (0,1,2 & 3).

The four (4) Performance Improvement Areas (PIA)  
(Airport Operations, Global Inter operability, Capacity and Flexibility of Flights and Efficient Flight Paths)

50 modules each having several elements with threads from Block 0 to Block 3 offering implementation choices

## b) Objectives: Global and Regional consistency

Technology Roadmaps (in Communication, Navigation, Surveillance, Information Management and Avionics)

Gradual improvement in Operations

APIRG AFI Implementation Action Plan Priorities

## **b) Objectives: KPA**

Access/Equity

Capacity

Cost Effectiveness

Efficiency

Environment

Flexibility

Global Interoperability

Participation of Stakeholders

Predictability

Safety



# c) Scope

ANS part of KCAA

## Operational evolutions

- *ATM*
- *AIS*
- *SAR*

## Technical improvements

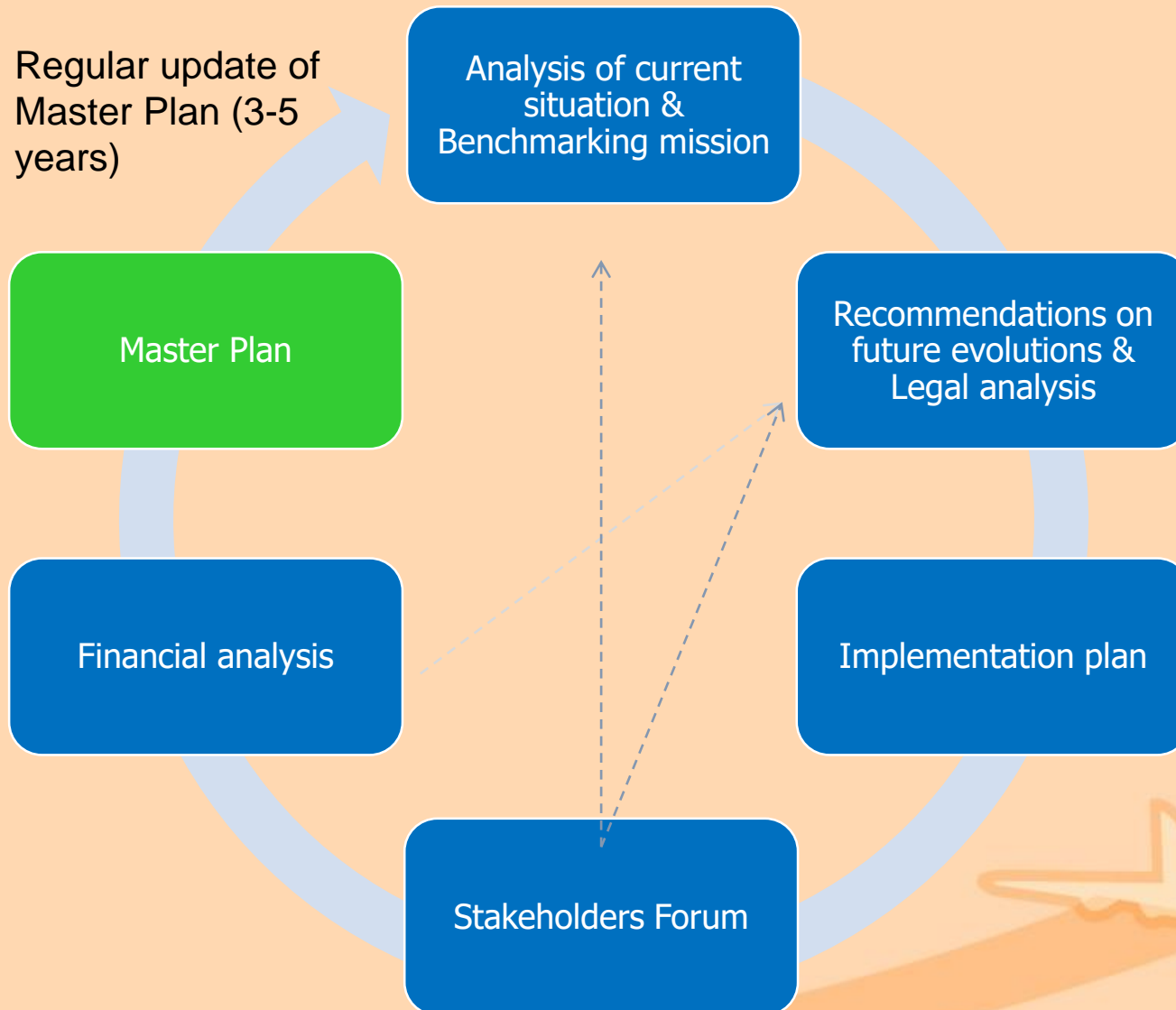
- *CNS*
- *Automation*

## Human resources evolutions

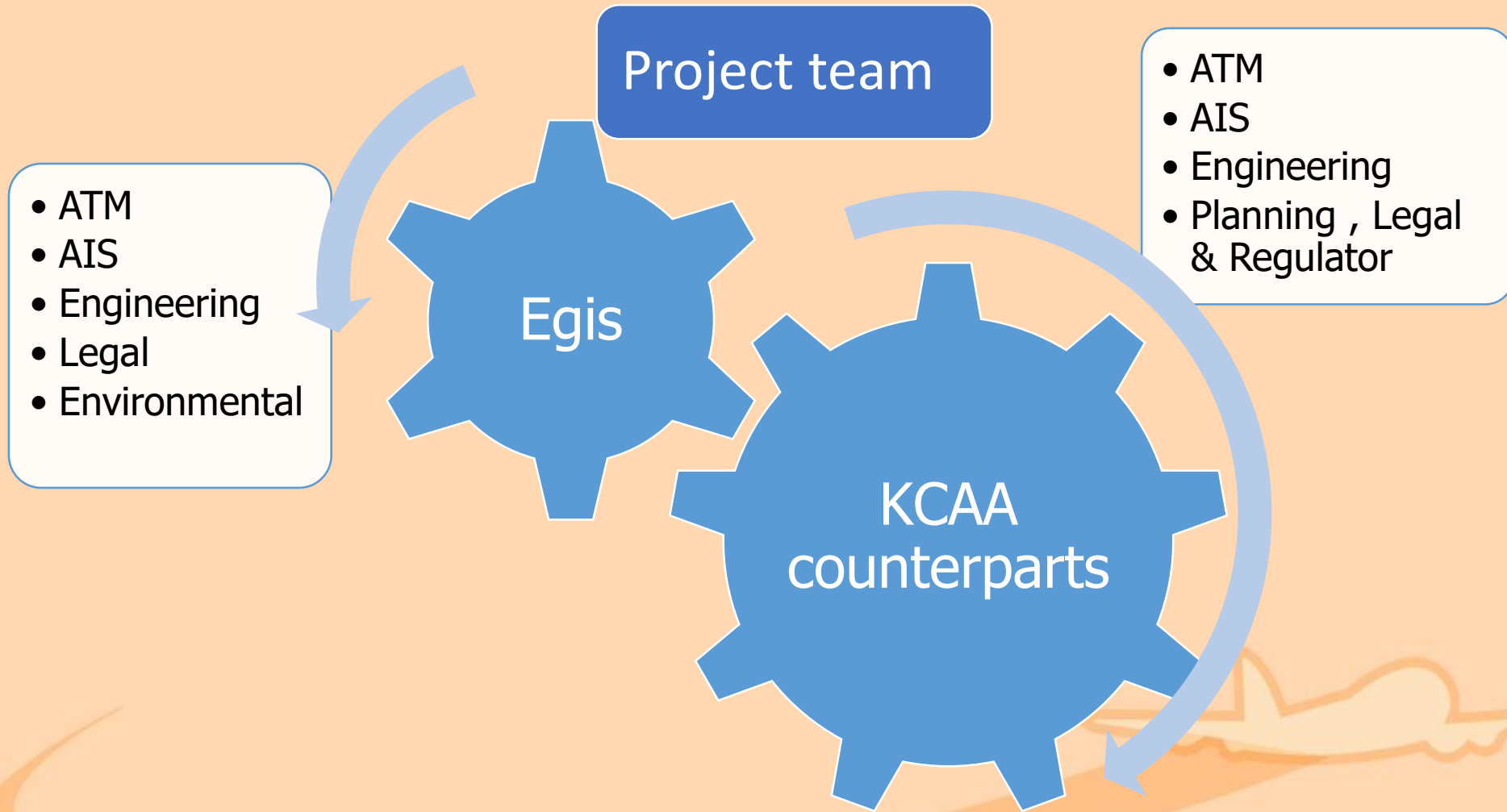
- *Staffing*
- *Training*

## Legal/regulatory aspects

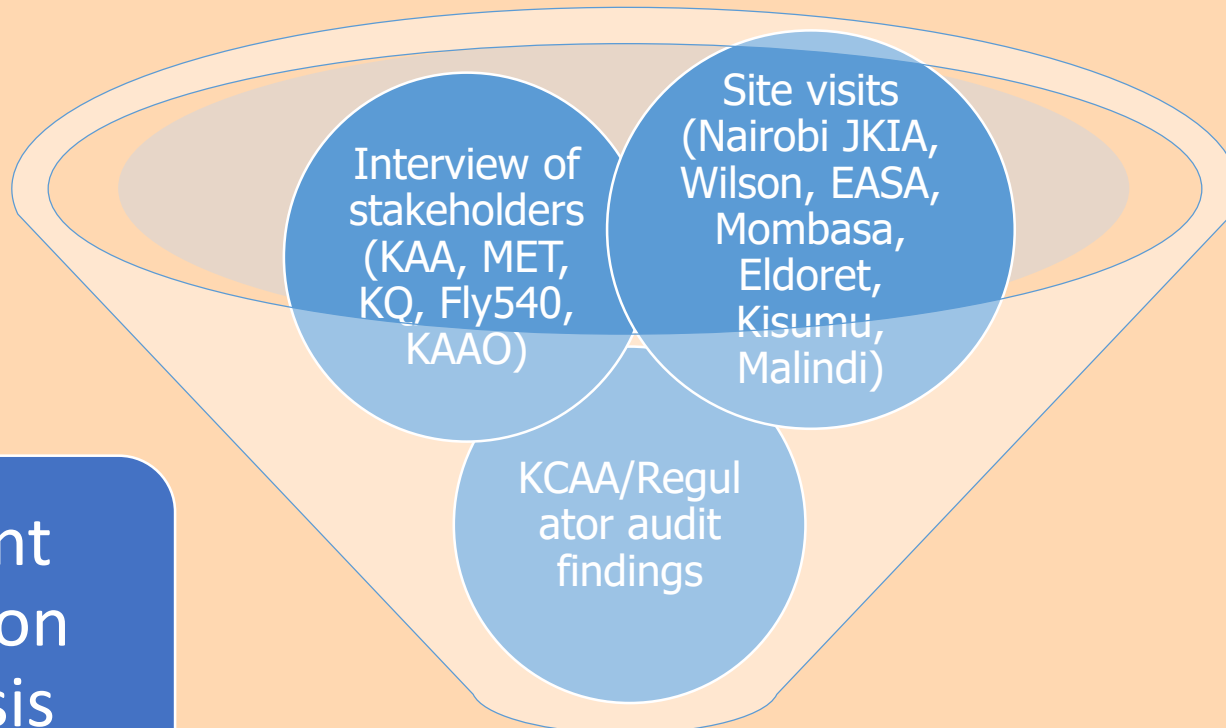
# d) Methodology



# d) Methodology



# d) Methodology



Identification of strengths and weaknesses  
& Airspace Users expectations

# d) Methodology

## Stakeholders Forum

Air Kenya

East African Civil  
Aviation  
Academy

Fly540

IATA

ICAO

Kenya Air Force

Kenya Airways

KAAO

KCAA/Regulator

KCAA/ANS

KCAA/EASA

KCAA/Corporate

Kenya Defense  
Forces

Kenya Maritime  
Authority

Kenya  
Meteorological  
Department

Kenya School of  
Flying

Mission Aviation  
Fellowship

Rudufu Ltd

SAC K Ltd

Uganda Civil  
Aviation  
Authority

## e) Evolutions

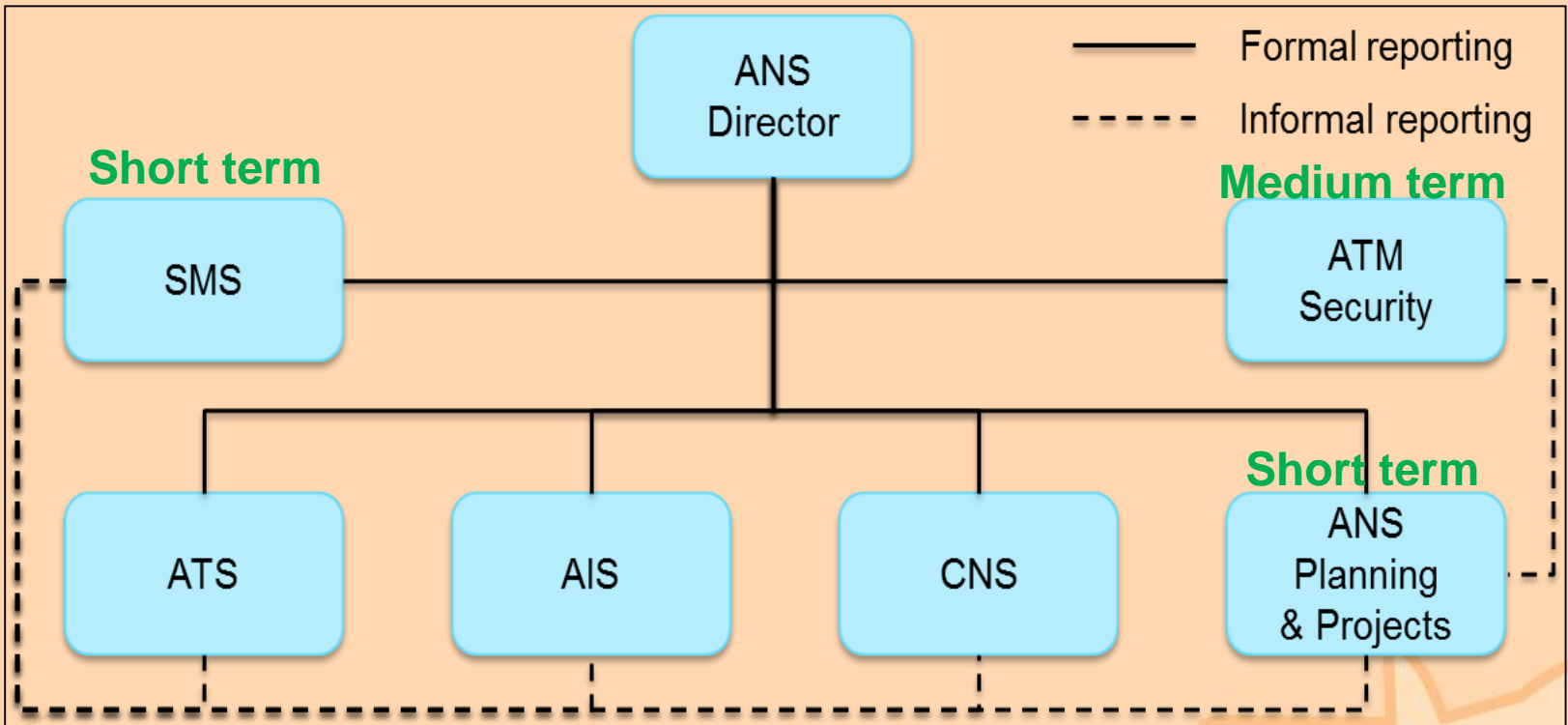
Classified over three five year periods of:

- ✓ 2016-2020 short term
- ✓ 2021-2025 medium term
- ✓ 2026-2030 long term

Major finding: SMS & R&D

# e) Evolutions

## ANS General



# e) Evolutions

## ATM En-route

### Short term

- FUA extension to include HKR10 area
- Routes network improvement using PBN
- ADS-C and CPDLC operational use
- Free Route concept implementation (oceanic area)
- Local ATFM implementation
- AIDC operational use between Nairobi and Mombasa

### Medium term

- AIDC operational use with neighboring countries
- Free Route extension (continental airspace)
- New ACC implementation
- New En-route sectorisation

### Long term

- ATFM implementation at regional level (if not done earlier)
- Free Route extension (regional level)



# e) Evolutions

## ATM Approach & Tower

### Short term:

- (AMAN and DMAN implementation in Nairobi TMA)
- Continued PBN implementation, enabling CCO/CDO.
- Point Merge concept implementation in Nairobi, supporting CDO
- New Nairobi APP sectorisation
- JKIA tower cab reorganisation (additional positions and TWR position arrangements)

# e) Evolutions

## ATM Approach & Tower

- Short term:
- Apron and Vehicle management improvement on maneuvering area
- Provision of Air Traffic Control at Lamu airport and Aerodrome Flight Information Services (AFIS) at other smaller airports
- Nairobi JKIA Airport Collaborative Decision Making (A-CDM) development
- JKIA 2nd runway ANS adaptations
- **Medium term-** Continuation of PBN implementation and Provision of ANS at other small Airports

## e) Evolutions

SAR

### Short term

- RCC upgrade (integrated ASAR software)
- Provision of dedicated frequency for communications with search aircraft

# e) Evolutions

## AIS

### Short term

- AIS system renewal (priority), on-line services to file flight plans
- Integration of “AMHS/AFTN management and operations” with AIS NOTAM Office
- Relocation of AIS offices (Kisumu, Wilson)

### Medium and long terms

- SWIM implementation at national level
- AIM System extension to integrate new functions enabled by SWIM

# e) Evolutions

## CNS & Automation

### Short term

- Communication links improvement
- HF equipment replacement (for back-up)
- ADS-B operational transition
- MLAT systems extension (e.g. Kisumu)
- Airport MLAT system at JKIA
- A-SMGCS operational transition

### Medium term

- Preparation of transition from MSSR to ADS-B
- EUROCAT system upgrade /replacement (SWIM, Free Route, additional positions for 3<sup>rd</sup> ACC sector, Disaster Recovery concept with new ACC, ATN B2)

### Long term

- ATN Baseline 2 implementation
- NAVAIDs rationalization
- GBAS Cat II / SBAS
- Transition to full ADS-B in En-route

# e) Evolutions

## Training

### Short term

- Training plans /programs for the different categories of personnel and the different stations
- AIS proficiency check tools
- OJTI and OPSUP training to ATCOs
- Specialized training to AIS staff in Aeronautical Chart
- Specialized and refresher training to PANS-OPS Officers
- Training on instructional techniques and refresher and advanced technical training for ATSEP

### Medium term

- Continued training for the main categories of personnel (ATCO/AFISO, ATSEP and AIS)

### Long term

- 3D Tower simulator at JKIA

# e) Evolutions

## Staffing

<b>CNS (Engineering)</b>		
July 2015	Required (without new sites)	Required (with new sites)
90	122	140

<b>ATM (ATCOs)</b>		
July 2015	Required (without new sites)	Required (with new sites)
162	230	248

- Aeronautical communication officers will be re-assigned to other functions (e.g. SMS data collection)

<b>AIS</b>	
July 2015	Required
55	72

<b>SMS</b>	
July 2015	Required
1	13

<b>ANS Planning &amp; Projects</b>	
July 2015	Required
0	5

<b>ATM Security</b>	
July 2015	Required
0	1

# f) Environmental Impact Assessment

Applicable ASBU modules having environmental impacts identified

Both Qualitative and Quantitative analysis of the environmental impacts conducted

Kenya target of average annual improvements in aviation fuel efficiency : at least 2 percent per year until 2020 from a 2010 baseline taken into consideration.



# f) Environmental Impact Assessment

## Prepare an Environmental Policy and Management System

- Monitor stakeholders compliance to commitments and environmental legislation.
- Advice NEMA on this master plan and request if Strategic Environmental Analysis will be required.

## g) Financial Analysis

Identification of investments grouped together (73 Projects)

Estimated costs and benefits for each project.

- ✓ (Total capital expenditure up to 2030 amounts to US\$36.8 million)
- ✓
- ✓ (US\$18.5m relates to projects that are required in the Base Case assuming no Master Plan)

Note: Safety benefits are extremely important, but difficult to quantify

# g) Financial Analysis

Between 2016 and 2030

- ✓ Additional operating costs of between US\$0.3m to US\$1.9m per annum in the Base Case and
- ✓ US\$0.3m to US\$4.6m per annum in the Master Plan Scenario

Projects will incur total quantifiable benefits amounting to US\$45.5 million.

Last 10 years, KCAA has spent an average of US\$5.6m per annum on capital projects.

## g) Financial Analysis

Capital cost of the Master Plan projects is estimated at US\$36.8m (or an average of US\$2.5m per annum)

Lower than the previous investment levels.

Operating costs predominantly staff costs, amount to US\$45.3m for 2015-2030.

Total cost will therefore be US\$82.1m or an average of US\$5.5m which is comparable to historic values

## g) Financial Analysis

2015 revenue of US\$35.0m may increase due to traffic growth generating an additional US\$24m per annum by 2030.

Many of the projects are inter-dependent so careful planning and monitoring of projects is required.

**Thank you**  
**Asante**  
**Merci**