TOPICS

• THE AVIATION SYSTEM
• CHICAGO CONVENTION
• MASTER PLAN – WHY NEEDED
• THE TOOLS
• PAST & CURRENT PROVISIONS
• FUTURE PROVISIONS
• BIBLIOGRAPHY
….all flights commence and terminate at an aerodrome.....
International air transport
Funding, Financing and Investment

To foster this projected growth in a sustainable manner, a large number of investments in the modernisation and expansion of quality aviation infrastructure are required over a long period. The global investment needs for airport expansion and construction, for example, are estimated at USD 1.3 trillion from 2013 to 2032. Investment in aviation infrastructure ensures that the capacity of the global aviation system can meet future demand, generate gains such as reductions in travel time and improvement of service predictability and reliability, and, at the same time, maintain public confidence that aviation is safe, secure and environmentally responsible.

Although aviation’s socio-economic benefits, its cross-cutting nature and multiple links to other economic sectors are widely recognised, this has never been stated as the level of investment which is necessary to truly derive these benefits. It is estimated that an investment of 4.3 per cent (USD 4.8 billion) of the total Official Development Assistance (ODA) provided by all donors for economic infrastructure and services for the past decade (2005-2012). In comparison, road transport was allocated a share of 5.7 per cent, which amounts to USD 55 billion. Unlike other modes of transport, the aviation industry has been paying for a vast majority of its own infrastructure costs (airports, runways, air traffic control), rather than being financed through taxation, public investment or subsidies. Infrastructure costs are recovered through payments of user charges, most of which are added to airfares. In 1976, airlines and passengers were estimated to have paid USD 7.1 billion to airports and navigation services.

Not only has the sector not received fair funding, but when it did, the value was understated significantly. A lack of accurate data on spending and investment in aviation infrastructure leads to misallocation of resources and underestimation of the role of aviation in socio-economic development. A more accurate and comprehensive assessment of future infrastructure needs is therefore necessary. Without proper accounting for the value of aviation infrastructure, there is a risk that countries will underinvest in new facilities and experience an unnecessary decrease in productivity. It is therefore important to utilise investment models that are based on accurate cost estimates and consider the full range of benefits that aviation infrastructure investments can deliver.
the aerodrome within a total system concept...
AERODROME - AIRSIDE

Runways, Taxiways, Aprons, Operations, Control Towers, Obstacles, etc. (Annex 14)

Local ATM
Annex 11
PANS-ATM

Local MET
Annex 3

Local AIS/MAP
Annex 3
Annex 15

FLT OPS
Annex 6
PANS-OPS

Local CNS
Annex 10

ENVIRON
Annex 18
AERODROME - LANDSIDE

- Terminals, Cargo, Ground Transport, Parking, Support Elements, etc.
  
- Facilitation
  - Annex 9

- Local AIS/MAP
  - Annex 3
  - Annex 15

- Security
  - Annex 17

- FLT OPS
  - Annex 6
  - PANS-OPS

- Local CNS
  - Annex 10

- ENVIRON
  - Annex 18

NO COUNTRY LEFT BEHIND
# NEW LARGE AIRCRAFT

<table>
<thead>
<tr>
<th></th>
<th>Boeing 747-400</th>
<th>Airbus A380-100</th>
<th>Boeing 747-8/8F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Passengers</td>
<td>416</td>
<td>555</td>
<td>467</td>
</tr>
<tr>
<td>Wingspan</td>
<td>64.40 m</td>
<td>79.75 m</td>
<td>68.40 m</td>
</tr>
<tr>
<td>Length</td>
<td>71.00 m</td>
<td>72.60 m</td>
<td>76.40 m</td>
</tr>
<tr>
<td>Height</td>
<td>19.40 m</td>
<td>24.00 m</td>
<td>19.50 m</td>
</tr>
<tr>
<td>MTOW</td>
<td>400 tons</td>
<td>560 tons</td>
<td>440 tons</td>
</tr>
</tbody>
</table>
AEROPLANES WITH FOLDING WINGTIPS

https://www.boeing.com/777x/reveal/video-777x-Folding-Wingtip/
Today’s aviation environment....

• Large, global & complex industry
• Highly sophisticated technologies
• Reduced capacity of regulators to be THE expert across a whole range of disciplines/ specialties
• Highly complex, automated & integrated systems
Today’s aviation environment....

- Increased failures: technology/human interface
- Greater commercial pressure – costs & time
- Greater public expectations on safety issues
- Greenfield airports – opening day issues
International obligations

The Chicago Convention
The Chicago Convention

- Signed on 7 December 1944
- Currently 192 States ratified – one of world’s most widely accepted international treaties
- Only global set of principles/rules governing international civil aviation
The Chicago Convention (cont’d)

- Contains 96 Articles in 22 Chapters
- Provides for the establishment of the International Civil Aviation Organization (ICAO)
- Gives Contracting States certain “RIGHTS” in exchange for meeting certain “OBLIGATIONS”
States “Rights”

- Uphold fundamental principles of Sovereignty of Contracting States (Art. 1)
- Grants transit & landing rights for non-scheduled traffic (Art. 5)
- Grants each State the right to reserve the traffic within its borders to its own airlines (Art. 7)
States “Rights” (cont’d)

• Grants each “User” State the right to equitable treatment from a “Provider” State in terms of rules of entry to, transition, through and departure from that State’s airspace and airports (Art.11&15)

• Provides for mutual recognition of certificates of airworthiness, personnel licences, etc. (Art. 33)
States “Obligations”

- Each State agrees to give uniform treatment to aircraft from other States when in their airspace or using their airports (Art. 11 & 15)
- Each State agrees to provide airports and air traffic services in conformance with standards and practices established under the Convention (Art. 28)
States “Rights” (cont’d)

• Each State agrees to implement in their national regulations the International Standards and Recommended Practices (SARPs) and Procedures adopted by ICAO in order to ensure the highest practicable degree of uniformity (Art. 37)
States “Rights” (cont’d)

- Each State is required to notify ICAO immediately if it finds it impracticable to comply in all respects with any International Standard or Procedure (Art. 38) – “filing of differences”
ICAO Annexes directed to the state

Contents of ICAO annexes must be transposed into national regulations

License personnel, certify aerodromes & organizations

Monitor licensed subjects for continued compliance
Two complementary roles

ICAO

• Develops principles and techniques to be adopted in Annexes
• Approves regional air navigation plans

STATES

• Apply Annex Standards
• Carry out oversight responsibilities
• Implement infrastructure according to regional plans
Annex 14, Volume I
Aerodrome Design and Operations
FOREWORD

Historical background

Standards and Recommended Practices for Aerodromes were first adopted by the Council on 20 May 1931 pursuant to the provisions of Article 37 of the Convention on International Civil Aviation (Chicago 1944) and designated as Annex 14 to the Convention. The Standards and Recommended Practices were based on recommendations of the Aerodromes, Air Routes and Ground Aids Division at its third session in September 1947 and at its fourth session in November 1948.

Table A shows the origin of subsequent amendments together with a list of the principal subjects involved and the dates on which the Annex and the amendments were adopted by the Council, when they became effective and when they became applicable.

Action by Contracting States

Notification of differences. The intention of Contracting States is shown in the obligations imposed by Article 38 of the Convention by which Contracting States are required to notify the Organization of any differences between their national regulations and practices and the International Standards contained in this Annex and any amendments thereto. Contracting States are invited to extend such notification to any differences from the Recommended Practices contained in this Annex and any amendments thereto, when the notification of such differences is important for the safety of navigation. Further, Contracting States are invited to keep the Organization currently informed of any differences which may subsequently occur, or of the withdrawal of any differences previously notified. A special request for notification of differences will be sent to Contracting States immediately after the adoption of such amendments to this Annex.

The intention of States is also shown in the provisions of Annex 15 related to the publication of differences between their national regulations and practices and the related ICAO Standards and Recommended Practices through the Aerodromes Information Service, in addition to the obligations of States under Article 38 of the Convention.

Protocolization of information. The establishment and withdrawal of all changes to facilities, services and procedures affecting aircraft operations provided in accordance with the Standards and Recommended Practices specified in this Annex should be notified and take effect in accordance with the provisions of Annex 15.

Status of Annex components

The Annex is made up of the following component parts, not all of which, however, are necessarily found in every Annex; they have the status indicated:

1. Nonstandardizing the Annex proper:

a) Standards and Recommended Practices adopted by the Council under the provisions of the Convention. They are defined as follows:

Standard: Any specification for physical characteristics, configuration, material, performance, personnel or procedure, the uniform application of which is recognized as necessary for the safety or regularity of

ANNEX 14 — VOLUME I
“Any specification for physical characteristics, configuration, material, performance, personnel or procedure, the uniform application of which is recognized as necessary for the safety or regularity of int’l air navigation and to which Contracting State will conform in accordance with the Convention; in the event of impossibility of compliance, notification to the Council is compulsory under Art. 38”.
RECOMMENDED PRACTICE

“Any specification for physical characteristics, configuration, material, performance, personnel or procedure, the uniform application of which is recognised as desirable in the interest of safety, regularity or efficiency of int’l air navigation and to which Contracting State will endeavour to conform in accordance with the Convention.”
• Notes included in the text, where appropriate, to give factual information or references bearing on the Standards or Recommended Practices in question, but not constituting part of the Standards or Recommended Practices.

• Attachments comprising material supplementary to the Standards and Recommended Practices, or included as a guide to their application.
Airport Master Planning

Why Needed?
ICAO Council President: African airport capacity critical to continent’s sustainable prosperity

Airport Planning and Development - Airports Can Do Much Better!

The Heathrow Forecast: Growth, Expansion and New Markets

Infrastructure for the Future: Passenger Growth Sector as Passenger Numbers Continue to Climb

Invest in Infrastructure for the Future

Address Infrastructure Crisis to Secure Aviation’s Future

Construction & Design

Develop quality aviation infrastructure (including air navigation systems) and airports commensurate with the level of predicted traffic growth and based on ICAO’s global plans.

ICAO News Release

Singapore - The Secretary-General of the International Civil Aviation Organization (ICAO) presented a global plan for infrastructure development, emphasizing the importance of sustainable growth for the aviation sector.

B

Expanding on the challenges facing the industry, the plan aims to ensure that airports and air navigation systems are capable of accommodating future traffic demand.

A discussion on the challenges facing the industry was presented, highlighting the need for significant investments in infrastructure to support sustainable growth.

ICAO News Release

Singapore - The Secretary-General of the International Civil Aviation Organization (ICAO) presented a global plan for infrastructure development, emphasizing the importance of sustainable growth for the aviation sector.

B

Expanding on the challenges facing the industry, the plan aims to ensure that airports and air navigation systems are capable of accommodating future traffic demand.

A discussion on the challenges facing the industry was presented, highlighting the need for significant investments in infrastructure to support sustainable growth.

ICAO News Release

Singapore - The Secretary-General of the International Civil Aviation Organization (ICAO) presented a global plan for infrastructure development, emphasizing the importance of sustainable growth for the aviation sector.

B

Expanding on the challenges facing the industry, the plan aims to ensure that airports and air navigation systems are capable of accommodating future traffic demand.

A discussion on the challenges facing the industry was presented, highlighting the need for significant investments in infrastructure to support sustainable growth.

ICAO News Release

Singapore - The Secretary-General of the International Civil Aviation Organization (ICAO) presented a global plan for infrastructure development, emphasizing the importance of sustainable growth for the aviation sector.

B

Expanding on the challenges facing the industry, the plan aims to ensure that airports and air navigation systems are capable of accommodating future traffic demand.

A discussion on the challenges facing the industry was presented, highlighting the need for significant investments in infrastructure to support sustainable growth.
Airport Master Planning

Why Needed?

- Assembly Resolutions
- PIRGS - regional activities paper
- ADOP/3 paper
ASSEMBLY RESOLUTIONS

- A23-14 Systems planning – new aircraft types
- A27-11 Airport & Airspace Congestion
- A39-1 Appendix F: Land Use Planning & Management
- A39-15 Appendix C: Airports charging policy
- A39-15 Appendix E: Forecasting, planning & economic analysis
- A39-18 Appendix C: Security
- A39-20 Facilitation
- A39-22 Appendix J: Provision of adequate aerodromes
The Tools
(in chronological order)
Airport Planning Manual (Doc 9184)

• First edition - 1967
• General review - 1976
• Second edition - 1987
Purpose & principle of Doc 9184 - Part 1

• Exclusively informational and advisory in character.
• Provide advice & guidance to responsible authority on methods to follow in developing the solutions to design problems, rather than presenting typical solutions for consideration.
• Emphasis on:
  – harmonizing airport master plan with plans for the future development and total transportation system.
  – inter-relationship of all elements of the airport design – movement areas, including aprons, passenger and cargo loading system, terminal building design, car parking areas and access roads etc – and ensuring that the master plan will permit expansion of any of its elements as requirements increase during the life of the plan.
Purpose & principle of Doc 9184 - Part 1 (cont’d)

- It would be restricted to state-of-the-art material and would not present theoretical or unproven concepts, except as may prove necessary in connection with new types of aircraft not yet in service.
- Advisory and informational rather than regulatory
- Deal with practice rather than policy
Cycles of amendments

- Since 1967, most Annexes had undergone series of amendments:
  - Annex 14: 33 cycles of amendments
  - Annex 3: ??
  - Annex 6: ??
  - Annex 9: ??
  - Annex 17: ??
  - Annex 18: ??
Amendment 1 to Annex 14 Vol I (1995)

• Consequential to Amendment 8 to Annex 17

  Recommendation.— Architectural and infrastructure-related requirements for the optimum implementation of international civil aviation security measures shall be integrated into the design and construction of new facilities and alterations to existing facilities at an aerodrome.

Note.— Guidance on all aspects of the planning of aerodromes including security considerations is contained in the Airport Planning Manual (Doc 9184), Part 1.

• Upgraded to a Standard via Amendment 3 (1999)
Amendment 7 to Annex 14 Vol I (2005)

- Arising from Recommendation 3/5 CAEP/6

**Recommendation.**— The design of aerodromes should take into account, where appropriate, land-use and environmental control measure.

Note.— Guidance on land-use planning and environmental control measures is contained in the Airport Planning Manual (Doc 9184), Part 2.
That was the past...

...now the future
Aerodrome Design and Operations Panel

• First meeting, 9 - 13 Feb 2015
• Job card on airport master planning created
• Airport Master Planning Task Force (AMPTF)
Good airport planning, including master planning, is vital in building the airport capacity timely in a phased approach, thus avoiding significant delays in the future due to capacity constraints. Airport capacity will be increased; and airport delays will be reduced through more precise and up-to-date airport planning.

Airport capacity will be increased and delays reduced through more precise and up-to-date airport planning techniques.
Aerodrome Design and Operations Panel

- Third Meeting, 26 – 29 March 2018
- See ADOP/3 – WP/9
- Provisions developed
- Supported by updated guidance in Doc 9184 Part 1 (work ongoing)
Airport Planning Manual (Doc 9184)

• 1st Edition - 1967
• 2nd Edition - 1987
• 3rd Edition - 2019 (expected)
  – SECTION 1
  – SECTION 2
  – SECTION 3
  – SECTION 4
Airport Planning Manual (Doc 9184)

- **Job card Leader:** David Stewart (IATA)
- **Section 1:** Airport Planning Process : Hendrik Orsinger (PASCALL & WATSON)
- **Section 2:** Airside Development : Marco Plarre (JACOBS)
- **Section 3:** Landside Development : Martin Landry (ARUP)
- **Section 4:** Airport Ops & Support Elements : Russell Blank (LANDRUM & BROWN)
ICAO publications related to Aerodrome Master Planning

- Appendix B of Doc 9184 Part 1
- 5 Annexes
- 1 PANS
- 35 Manuals: aerodromes, facilitation, CNS, Env, Sec, traffic forecasting, statistics, charges, etc.
Where do we go from here..

- ANC Preliminary Review (Oct 2018)
- State letter consultation (Q4/2018)
- Secretariat analyses (Q2/2019)
- ANC Final Review (Q3/2019)
- Council adoption (Q1/2020)
- SARPs applicable (Q4/2020)
MUCHAS GRACIAS

jccheong@icao.int