

出國報告(出國類別：開會)

# 出席 2018 「Future Ready Airports」 論壇及發表專題演說 出國報告書

服務機關：桃園國際機場股份有限公司  
姓名職稱：廖振志 副處長  
派赴國家：新加坡  
出國期間：民國 107 年 7 月 22 日至 7 月 26 日

## 摘要

本次職代表本公司陳副總經理福將出席參加由 Marcusevans 公司在新加坡主辦「Future Ready Airports」7月23至7月25日論壇，主辦單位邀請桃園國際機場股份有限公司針對「Smart Terminal」主題進行專題性之演講，其本次於論壇講題是「Leveraging Smart Facilities to Ensure Seamless Terminal Operations: A Case Study of Taoyuan International Airport T3, Taiwan」。

另與澳洲機場、印度機場及美國機場等各國之代表，還有各國顧問公司代表與廠商代表進行相關經驗交流討論，議題集中在建置未來機場所須具備之備援，包括非航空收入，智慧綠色機場，智慧設施，數位環保等等，有助於後續作為第三航廈各項系統整合及設計優化之參考與借鏡。

**關鍵詞：智慧航廈、國際論壇、經營管理**

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## 壹、目的

本次「Future Ready Airports」論壇在新加坡舉行，由 marcusevans 公司邀請桃園國際機場股份有限公司針對「Smart Terminal」主題進行專題性之演講。本次演講原邀請陳副總福將出席參與演說，然因本公司刻正積極辦理「臺灣桃園國際機場第三航站區」各項設計與規劃，公務繁忙，故由職代理出席發表演說。

此次專題演說發表主題為「SMART TERMINAL Leveraging Smart Facilities to Ensure Seamless Terminal Operations: A Case Study of Taoyuan International Airport T3, Taiwan」，簡報內容主要針對智慧航廈相關設施建置來說明本公司「臺灣桃園國際機場第三航站區」設計規劃方向與執行情形，論壇間簡報相關系統內容說明如下所示：

1. Smart airport' s facilities architecture  
(智慧機場設施建構)
2. Smart security construction for good passenger experience  
(提供智慧安檢系統)
3. Build up new Baggage Handling System to solve existing

bottleneck

(建置行李處理系統以解決現有困境)

#### 4. Integrate all facilities for Airport Collaborative Decision Making

(利用機場整合決策系統(ACDM)串聯整體航廈設施系統)

本論壇亦邀請各國如澳洲、印度及美國等各國機場之官方代表分享該國機場基礎建設投資方向，還有各國顧問公司代表、民航單位與航空公司廠商，藉此寶貴機會與代表相互交流溝通，獲取許多國際標竿機場發展趨勢與相關營運經驗，未來可作為第三航廈各項系統整合及設計優化之參考與借鏡。

## 貳、行程說明

### 一、本次行程為整體規劃如下


日期	時間	行程說明	備註
107/07/22	0750-1225	桃園至新加坡	出發
107/07/23	0830-1700	抵達會場辦理報到事宜，論壇開幕儀式 參與 Future Ready Airports 論壇	
107/07/24	0830-1700	參與 Future Ready Airports 論壇	
107/07/25	0830-1700	參與 Future Ready Airports 論壇 發表演說	
107/07/26	1325-1820	新加坡至桃園	返台

### 二、本次出國成員如下


單位	姓名	職稱
工程處	廖振志	副處長

# 參、過程內容

## (一)、論壇行程



**FUTURE READY AIRPORTS**  
a marcusevans event




**LSE**  
LONDON SCHOOL OF ECONOMICS

### THE PROGRAMME - DAY ONE

**monday 23<sup>rd</sup> July 2018**

0830	Registration and Morning Coffee
0845	Opening & Welcome Remarks from the Chairperson <b>Brendan McRandle</b> , Executive Director, Aviation and Airports & Western Sydney Unit, Infrastructure, Regional Development and Cities, DEPARTMENT OF INFRASTRUCTURE, AUSTRALIA
0900	<b>COUNTRY SPOTLIGHT: AUSTRALIA</b> <b>Gaining an Overview of Airport Investments in Australia and the Infrastructure Plan of Western Sydney Airport</b> <b>Brendan McRandle</b> , Executive Director, Aviation and Airports & Western Sydney Unit, Infrastructure, Regional Development and Cities, DEPARTMENT OF INFRASTRUCTURE, AUSTRALIA
0940	<b>COUNTRY SPOTLIGHT: THE NETHERLANDS</b> <b>Upgrading Airport Infrastructure to Gain a Competitive Advantage as an International Hub: A Case Study of Amsterdam Airport Schiphol</b> <b>Gerard Geurtjens</b> , Project Director, Capital Programme, new Pier & Terminal, SCHIPHOL GROUP, THE NETHERLANDS
1020	Morning Refreshments
1050	<b>COUNTRY SPOTLIGHT: SOUTH KOREA</b> <b>Expanding Airport Infrastructure to Accommodate the Future Passenger Growth: A Case Study of Incheon International Airport</b> <b>Cheon Sung Han</b> , Deputy Director of Civil Engineering Group, INCHEON INTERNATIONAL AIRPORT, SOUTH KOREA
1130	<b>DESIGNING RESILIENCE</b> <b>Incorporating Flexible Airport Designs that Allow Facilities to be Reconfigured to Adapt to Change</b> <b>Ian Taylor</b> , Director of Aviation, Global Business Leader, ARUP, HK
<b>LEADERS LOUNGE: EN ROUTE TO ENABLING AIRPORT GROWTH</b>	
1210	<b>Dealing with Current and Future Airport Capacity Mismatch: What Needs to be Done?</b> Moderator: <b>Brendan McRandle</b> , Executive Director, Aviation and Airports & Western Sydney Unit, Infrastructure, Regional Development and Cities, DEPARTMENT OF INFRASTRUCTURE, AUSTRALIA Panellists: <b>Gerard Geurtjens</b> , Project Director, Capital Programme, new Pier & Terminal, SCHIPHOL GROUP, THE NETHERLANDS <b>Subir Hazra</b> , VP & Head of Strategic Planning, DELHI INTERNATIONAL AIRPORT, INDIA <b>Marc Houalla</b> , Executive Director & MD, PARIS-CHARLES DE GAULLE AIRPORT- GROUPE ADP, FRANCE
1250	Networking Lunch
<div style="width: 48%; background-color: #0056b3; color: white; padding: 5px;"><b>GATE ONE: DESIGN, DEVELOPMENT &amp; EXPANSION</b></div> <div style="width: 48%; background-color: #0056b3; color: white; padding: 5px;"><b>GATE TWO: OPERATIONAL EXCELLENCE &amp; INNOVATION</b></div>	
1350	Chairperson's Opening Remarks <b>Subir Hazra</b> , VP & Head of Strategic Planning, DELHI INTERNATIONAL AIRPORT, INDIA
1400	<b>GREEN AIRPORT</b> <b>Assessing Challenges in the Airport Business: A Sustainability Perspective</b> • Striking the right balance between regulatory and social forces to ensure sustainable growth • Identifying the key drivers in transforming the entire airport ecosystem to meet future passenger needs • Airport sustainability: Burden or benefit? <b>Jakrapop Charatiri</b> , VP, AIRPORTS OF THAILAND (AOT), Chairman-Regional Environment Committee, ACI-ASIAPAC
1440	<b>Exploring Innovative Future Flying Machines: Opportunities for Airports</b> • Introducing the L&B Lab: Helping airports define future technologies, seamless travel and planning for the airport of the future • Unleashing the transformative potential of urban air transport: How should airports respond? • What other flying machine technologies should airports prepare for? <b>Gary Gibb</b> , President - APAC, LANDRUM & BROWN, AUSTRALIA
1520	Afternoon Refreshments
1550	<b>Creating a Dynamic and Attractive Urban Environment that Fosters a Sense of Community Surrounding the Airport</b> • Assessing the role of airports as a catalyst to economic growth and infrastructure enhancements • Gaining insights into key community needs due to the evolution of airports into major business hub • Promoting collaboration between airports and community to achieve an inclusive growth and cater mutual needs <b>Subir Hazra</b> , VP & Head of Strategic Planning, DELHI INTERNATIONAL AIRPORT, INDIA
1620	<b>Designing Efficient Emergency Exit for a Modern Terminal Concourse</b> • Evaluating modern airport terminal concourse passenger occupant load densities • Case study on comparison of the actual peak period passenger or occupant load density versus codes prescribed occupant load density • Identifying alternative methods for exit facilities design <b>John Devlin</b> , VP & Practice Leader - Aviation, JENSEN HUGHES, USA
1700	Chairperson's Closing Remarks & End of Day One
1350	Chairperson's Opening Remarks <b>Paul Coughlan</b> , Project Director, New Parallel Runway, BRISBANE AIRPORT, AUSTRALIA
1400	<b>Optimising Airport Collaborative Decision Making (A-CDM) to Streamline Services and Improve Overall Airport Efficiency and Safety</b> • Achieving holistic optimisation of airspace, passenger and landside operations • Catalysing collective performance-based airport management strategies to improve predictability, punctuality, cost and operational efficiency • Utilising technology to enhance safety of high-performance operations <b>Marc Houalla</b> , Executive Director & MD, PARIS-CHARLES DE GAULLE AIRPORT, FRANCE
1440	<b>Harnessing the Power of Innovative Digital Business Solutions to Maximise Airport Performance</b> • Leveraging state-of-the-art technologies for process improvements and cost optimisation • Analysing starter kit for data acquisition • Introducing innovative softwares for optimal resource planning and enhanced passenger convenience <b>Hans de Jonge</b> , CEO, SIEMENS, SINGAPORE
1520	Afternoon Refreshments
1550	<b>RUNWAY TO NEW HEIGHTS</b> <b>Justifying Your Business Case for a New Runway: Costs vs. Benefits</b> • Highlighting the role of a new runway to better meet future demands • Reviewing the environmental concerns and measures implemented • Identifying and assessing key project challenges and ways to overcome them <b>Paul Coughlan</b> , Project Director, New Parallel Runway, BRISBANE AIRPORT, AUSTRALIA
1620	<b>INTERNET OF THINGS (IOT)</b> <b>Future Service Ready Airports: Strengthening the Digital Core</b> • Realising a stronger airport digital service core • Harnessing the power of combining asset management with service execution • Gaining insights on solving the downtime equation <b>Jay Shears</b> , Director, Product Marketing - Aviation & Transportation, GE DIGITAL, USA
1700	Chairperson's Closing Remarks & End of Day One



marcusevans large scale events

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Taoyuan Airport  
桃園機場

## THE PROGRAMME - DAY TWO

tuesday 24<sup>th</sup> july 2018

- 0830 Registration and Morning Coffee
- 0845 Opening & Welcome Remarks from the Chairperson  
**Graham Bolton**, Global Aviation Practice Leader, **MOTT MACDONALD**, UK, Chairman, **BRITISH AVIATION GROUP**
- 0900 **SERVICE EXCELLENCE**  
**Delving into Cultural Differences and the Future of Airport Customer Experience**
- What is a passenger persona?
  - Re-thinking customer service strategies to meet future passenger expectations and needs
  - Highlighting the importance of culture in customer experience management
- Steve Mayers**, Director of Customer Experience, **HARTSFIELD-JACKSON ATLANTA INTERNATIONAL AIRPORT**, USA
- 0940 **LANDSIDE ACCESSIBILITY**  
**Designing Improved Airport Surface Access Strategies to Deliver a Seamless Passenger Travel Experience**
- Assessing the importance of rail connections to the airport and how they will help support economic growth
  - Designing the right combination of services – the use of rail, tram and bus
  - Delivering an innovative transport plan that will deliver expansion in a sustainable way
- Graham Bolton**, Global Aviation Practice Leader, **MOTT MACDONALD**, UK, Chairman, **BRITISH AVIATION GROUP**
- 1020 Morning Refreshments
- 1050 **SECURITY OPTIMISATION**  
**Utilising a Multi-Agency System Approach to Deliver Enhanced Security for Modern Airports: A Case Study of Gatwick Airport, UK**
- Leveraging multiple agencies and networks to enhance security
  - Enhancing landside security against evolving threats
  - Shaping future security environment through innovation, procedures and technology
- Damien Trower**, Head of Airport Security, **GATWICK AIRPORT**, UK
- 1130 **REGIONAL OUTLOOK: ASIA PACIFIC**  
**Assessing the Best Practices and Lessons Learnt in Airport Privatisation**
- Gaining insights into the perceived benefits of airport PPPs
  - Evaluating the risks, perceptions and misconceptions with airport PPPs
  - Reviewing different types of airport privatisation models
- Neil Bentley**, VP, Aviation - APAC, **AECOM**, HK
- 1210 **COUNTRY SPOTLIGHT: SOUTH AFRICA**  
**Planning and Designing Airports and Airports Cities to Boost Regional Economic Growth**
- A look at Africa's potential as the last untapped market for global aviation
  - Sharing of insights and experience from two major airport projects
  - Exploring strategies for expanding the economic impact of airports via airport city developments
- Jonathan Manning**, Group MD, **OSMOND LANGE/IKEMELENG ARCHITECTS**, SOUTH AFRICA
- 1250 Networking Lunch
- 1350 **INTELLIGENT AIRPORT**  
**Advanced and Futuristic Smart Communication Solutions to Support Modernisation**
- Scaling up of communication solutions within existing infrastructure in a cost effective manner
  - Addressing challenges in providing a wireless communication network
  - Exploring new opportunities through the implementation of a smart communication platform
- Linoj K George**, CEO, **CELLCOM SOLUTIONS**, INDIA
- 1430 **A CITY WITHIN AN AIRPORT**  
**Creating a Sense of Place in Airports: A Case study of Abu Dhabi International Airport, UAE**
- Designing an iconic, state-of-the-art building that reflects the city's character
  - Creating interior spaces with urban characteristics to react to the scale of the building
  - Using technology innovatively, to deliver an organically shaped building form
- Mustafa Chehabeddine**, Principal, **KOHN PEDERSEN FOX ASSOCIATES**, UK
- 1510 Afternoon Refreshments
- 1540 **SEAMLESS CONNECTIVITY**  
**Assessing the Role of Airports in Multi-modal Integration in Developing a Collaborative Economy**
- Exploring the success stories and lessons learnt for integrated and intelligent multi-modal transportation solutions
  - Embracing innovation and emerging technology in creating seamless networks
  - Assessing the policy, planning, design and coordination for multi-modal integration
- Khair Mirza**, Associate Director, **MODALIS INFRASTRUCTURE PARTNERS**, MALAYSIA
-  **AIRLIVE CHATROOM**
- 1620 This session provides an engaging experience between panel members and in-house participants to address any questions regarding the challenges faced in existing and future airport development.  
*Moderator:*  
**Graham Bolton**, Global Aviation Practice Leader, **MOTT MACDONALD**, UK, Chairman, **BRITISH AVIATION GROUP**
- 1700 Chairperson's Closing Remarks & End of Day Two





## THE PROGRAMME - AIRPORT DIGITALISATION

wednesday 25<sup>th</sup> July 2018 | TOWARDS NEXT-GENERATION AIRPORTS

### REVOLUTIONISING PASSENGER TRAVEL EXPERIENCE THROUGH DIGITALISATION

0830 Registration and Morning Coffee  
0900 Opening & Welcome Remarks from the Chairperson  
**Michael Portier, MD, To70 AVIATION CONSULTING, SINGAPORE**

0910 **SMART TERMINAL**  
**Leveraging Smart Facilities to Ensure Seamless Terminal Operations: A Case Study of Taoyuan International Airport T3, Taiwan**

- Delving into the smart facilities architecture and smart security to enhance passenger experience
- Incorporating a new baggage handling system to overcome existing bottlenecks
- Adopting A-CDM through facilities integration

**Philip Liao, Deputy Project Director, TAOYUAN INTERNATIONAL AIRPORT, TAIWAN**

**DIGITAL ECOSYSTEM**  
**Unlocking Synergies for Airports and Airlines to Digitise Passenger Travel Experience and Improve Operations: A Case Study of Helsinki Airport, Finland**

- How airports and airlines can work together to provide a seamless travel experience enabled by digital?
- What are the key topics in developing airport processes as an ecosystem?
- Sharing data to enable digital development and innovation

**Heikki Koski, Chief Digital Officer, FINAVIA, FINLAND**

1030 Morning Refreshments

1100 **LEADERS XCHANGE: IS YOUR AIRPORT READY?**  
**Coping with the Revolutionary Technologies to Meet Today's Millennial Passenger Expectations**

*Moderator:*  
**Michael Portier, MD, To70 AVIATION CONSULTING, SINGAPORE**

*Panelists:*  
**Steve Mayers, Director, Customer Experience, HARTSFIELD-JACKSON ATLANTA INTERNATIONAL AIRPORT, USA**  
**Philip Liao, Deputy Project Director, TAOYUAN INTERNATIONAL AIRPORT, TAIWAN**  
**Khair Mirza, Associate Director, MODALIS INFRASTRUCTURE PARTNERS, MALAYSIA**

1200 **INTEGRATED AIRPORT**  
**Driving Excellence in ATM through System Wide Information Management (SWIM)**

- Diving into SWIM – Concept and scope
- Tapping into the benefits of SWIM
- Improving airport operational efficiency

**Michael Portier, MD, To70 AVIATION CONSULTING, SINGAPORE**

1240 Networking Lunch

**HALF DAY WORKSHOP**

1320 **ROLE OF DIGITALISATION IN MODERN AIRPORTS WITH COMPLEX ASSET MANAGEMENT REQUIREMENTS**

Modern airports are large facility complexes with many critical systems employing thousands of assets. It is cost-prohibitive and perhaps unwise to try to maintain all these assets at the same level of service regardless of where they sit. Airports are also faced with issues to anticipate changes in demand for different services in this changing economic and geo-political scenarios and contexts. Our workshop presents how digital asset investment platforms such as the Asset Investment Planning (AIP) tools can help in overcoming those challenges.

**Introduction of Asset Investment Planning (AIP) tools**

- How to generate multi-year forecasts of capital needs based on airport asset base and desired service levels?
- Utilising multiple parameters such as asset type, asset criticality, business importance, desired service levels, cost and impact of treatment, etc. for asset replacement or treatment
- Assessing the power of AIP tools in simulating likely scenarios for asset degradation and performance

**Assessing Top 3 requisites of AIP Digital Solutions and their Implementations in Modern Airports**

- Data frameworks
- Business rules
- Decision analytics

**Exclusive Scenario Planning Session**

Our workshop will take the participants through an anonymised yet real world scenario on how this can be put in practice. Participants will gain insights and a practical understanding of the key methodologies in assessing their airport capital planning needs that help in future business decision making.

**Tapping into the Benefits of AIP**

- Identification of time and type of right interventions – overhaul/refurbish, repair or replace assets
- Capturing Asset Replacement Value (ARV) after considering all relevant factors
- Delivering optimum cost investment plan by modelling the opportunities and impacts for the future (10,20,30 years)

*Afternoon Refreshments will be served at 1500*  
*Conference ends at 1700*  
*Workshop Facilitator:*  
**Kunal Virmani, Head of Digital, SNC-Lavalin's Atkins APAC**

職代表本公司發表演說

#### WORKSHOP FACILITATOR

**Kunal Virmani**, Head of Digital Sales, SNC-Lavalin's Atkins APAC  
Kunal Virmani leads Digital Asset Management Sales at SNC-Lavalin's Atkins business in Asia Pacific. He has experience in solutions around the EAM, IoT, AIP and APM space. Kunal has worked in different parts of the world including ASEAN, India and UK for last 18+ years while focusing on Asset Intensive industries like Travel & Transportation, Oil & Gas and Utilities. With his Engineering background and Business Studies from an esteemed school; Symbiosis from India, he has been able to set-up and expand new technology and companies in developing world.

#### BENEFITS OF ATTENDING THIS WORKSHOP

- Planning** capital budgets by generating multi-year forecasts of capital needs based on their asset base and desired service levels
- Generating** optimised multi-year intervention strategies for different business and funding scenarios
- Maximising** the value received from the capital expenditure while meeting the organisation's desired service levels



## (二)、 2018 「Future ready airport」國際論壇簡報

2018 「Future ready airport」論壇在新加坡舉行，舉辦主旨基於全球旅運量大幅成長，各國國際機場皆面臨巨大挑戰，如何載運量增長的同時，提供最佳設施以增進更好之服務品質，獲取更多非航空收入，為一相當重要之課題，因此提供此一平台與各國講者及與會者相互交流與經驗分享，研討會為期三天，針對機場之規劃設計、營運與機場維護三方面進行相關議程之研討，主要主題如下所示：

1. 澳洲、荷蘭、南韓、南非國際機場亮點介紹專題演講 Country Spotlight-Australia, The Netherlands, South Korea and South Africa
2. 機場設計開發與擴建 Design, Development & Expansion
3. 機場卓越營運與創新 Operational Excellence & Innovation
4. 機場設施最佳化 - 陸側無障礙、安檢最佳化 Landside accessibility & Security optimization
5. 智慧航廈 Smart Terminal
6. 數位科技與環保 Digital Ecosystem & environment



圖 1.論壇開幕主席專題演說



圖 2.論壇講者與與會者參與情形

本次在「智慧航廈」演說主題中，由本公司辦理第三航廈建立智慧航廈計畫發起：針對未來的不確定性提供彈性且具建設性之解決方案，尋找最適合之解決技術方案，以提供旅客最便捷舒適之服務品質。

以智慧航廈針對離境相關為例，要達成便捷快速通關為目標，需連結各航廈內之 ICT 系統、行李處理系統(自助報到及行李托運)、智慧安檢系統，提供更多人性化設施，及大量採用全/半自動或自助式設備，除大量減少機場所需之人力外，在科技領導的迅速進步下，著實提升旅客對於機場的體驗，亦於無形中增加機場好感度，其各系統之設備引用及相互配合為達成智慧航廈目標之重要要件。

另需整合機場相關作業單位(如航空公司、飛航管制單位、航警局與移民署等)，建立共同決策平台，利用機場整合決策系統(ACDM)串聯整體航廈設施系統進行整合。達成 ACDM 所定義之 16 項里程碑目標，本次也藉此發表演說有關第三航站區建置計畫機會，也讓台下之與會來賓認識台灣，會後有不少官方與相關顧問公司交流討論。



圖 3. 與各國機場公司代表、民航單位與航空公司等交流意見

### (三)、 參與 「Future ready airport」 專題研討

在論壇期間參與許多專題討論，包含許多國家機場之機場發展當前和未來挑戰的戰略、營運管理、規劃及機場通訊科技，獲取不同機場相關管理經驗，其中主要重點國際機場經驗分享研討如下：

## 荷蘭史基浦機場-升級機場基礎設施以因應未來成長趨勢

(Expanding Airport Infrastructure to Accommodate the Future Passenger Growth : A Case study of Amsterdam Airport Schiphol)

史基浦機場於荷蘭阿姆斯特丹，為歐洲主要樞紐機場，在 2013 年旅運量達約 5200 萬人次，而在 2016 年之旅運量更突破來到約 6300 萬人次，預計 2025 年後會突破 7000 萬人次，為了因應旅運爆炸性成長，未來 10 年機場會積極性進行擴建與設施更新改建，包含新建航廈進行，與升級機場基礎設施刻不容緩，主要分為四大主軸，可作為未來第三航廈因應旅運量成長之參考：

1. 航空公司與飛機：飛機旅運起降架次頻繁，為避免飛機調度安排與起降不順，造成時間浪費，建立相關掌控設施，例如 AVDGS，顯示機坪使用狀態與停靠班機大小，並提供飛行員即時停機引導，以利協調靠橋或起飛。
2. 旅客動線與服務：設置多項自助/半自助設施係統以利整體旅客安檢時程縮短，如設置智慧人體全身掃描儀，全面進行檢查，站定於正確檢查位置，花數秒時間即可分辨合格不合格旅客以進一步檢查。另較大空間設置智慧安檢行李流程及設備配置，並分流合格與不合格行李；自動回收安檢托盤於安檢完成後自動送回安檢起點供旅使用，減少人員走動來回收送安檢托盤，以縮短相對時間。
3. 不動產土地：徵收機場鄰近土地以利擴大未來旅運需求之設

施建設。

4. 機場內部各合作夥伴相互協調平台：民航機關、航空公司、與相關民間企業或商業設施等建立一協調平台，於突發緊急狀況可立即處理或預防，亦可在訂定目標進行整合與達成。



圖 4.史基浦機場專案人員簡報



圖 5.史基浦機場專案人員簡報內容

Facility	Phase 1	Phase 2	Phase 3	Sub Total	Phase 4
Period	1992-2001 (9 years)	2002-2008 (6 years)	2009-2017 (8 years)	-	-
Budget	USD 5.6 bil.	USD 2.9 bil.	USD 4.9 bil.	USD 13.4 bil.	-
Flights	330,000	170,000	-	500,000	560,000
Passengers	40 million	14 million	18 million	72 million	100 million
Cargo	2.7 mil. tons	1.8 mil. tons	0.5 mil. tons	5.0 mil. tons	6.3 mil. tons

圖 6. 史基浦機場專案人員簡報內容

## 法國戴高樂機場-利用 ACDM 使整體服務、效率與安全性提升

(Optimizing Airport Collaborative Decision Making (A-CDM) to Streamline Services and improve Overall Airport Efficiency and Safety)

在戴高樂機場 CDM 的核心管理單位為 CDG 營運者、飛航服務提供者及地面 OPS 營運者,其他利益相關單位包含地勤、政府服務者,透過 Eurocontrol 所設計的協調整合決策系統,運用 16 項航班各階段的重要里程碑,即時分享資訊,以協助利益相關單位可及早進行狀況評估及反應,達成的效益包含:資源運用與基礎建設調適最佳化,提升服務品質、交通流量預測及準確度、在不良情況下的管



理、機場與流量管理中心(CFMU)的管理效率，最終更好的整合Eurocontrol 計劃。

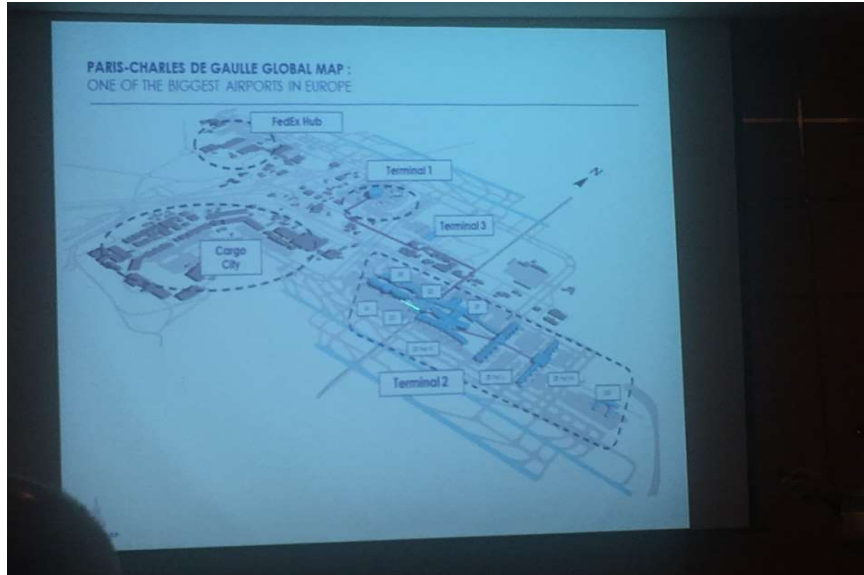


圖 6. 法國戴高樂機場專案人員簡報內容



圖 6. 法國戴高樂機場專案人員簡報內容

## 肆、心得及建議

經由本次論壇參與，體認到全球各國隨著航空業發展，旅客與物流經由空中運輸已是稀鬆平凡的事情，重點轉運樞紐國家機場也隨著這些脈動，旅運人次不斷的增長，為了因應這些變化，需要有更多的戰略去布局，提升整體航空產業鏈中經濟價值，創造更大的收益。

而論壇中也分「智慧航廈」、「航廈設施開發」、「經營管理營運創新與維護」等多種面向議題進行討論，下面就出席本次論壇中所學習及相關體悟之心得與建議，提出陳列如下：

### 一. 史基浦機場面臨旅運人口爆炸性成長因應策略-航廈「效率」面

**心得：**對於荷蘭史基浦機場而言，國際旅客運量成長率已讓該國機場公司需刻不容緩執行對策進行因應，在對策中提及以「效率」與「建設」作為優化，以打造智慧航廈之目標。

在「效率」方面，航站陸側區域中引進先進旅客導引系統，例如結合行動智慧 app 提供旅客即時航班動態系統、航廈內部動態查詢引導系統與連貫式旅客動線規劃等，提升旅客便利性及加速尖峰時段旅客動線消化；而在安檢系統方面引進先進自助/半自助行李及旅客安檢系統，短時間內判讀旅客及物品是否有問題，並進一步處理，加速處理旅客安檢效率，亦可節省一定人力。而效率亦不節省安全性，在科技結合下收集每位旅客生物辨識、照片與護照資訊回饋收集至民航機關，進一步將資

料進行比對，以排除危險，另外藉由先進安檢設備提升辨別危險物品之準確性，確保航空保安。

而在空側區域中引進航機管理系統，利用高效率及精準的自動化系統來引導飛機停靠機坪。以減少出錯機會，避免時間浪費，創建更安全的操作環境。且地勤人員可以更專注於準備飛機起飛，航管人員可進一步掌控飛機動態，確保飛航安全。

**建議：**在多種類利於提升效率與安全性之科技設施導入於航廈之經驗分享中，未來可回饋我國進行第三航站區建設之規劃，另外隨著航站區建設中，亦需隨時了解更新開發之設施，並比較其優缺點，與航空合作夥伴進行研討，購置最適宜之設備進行使用，提升「效率能量」。

另外如果資金許可下，甚至可結合我國企業，合作開發智慧航廈需求相關之軟硬體系統，以輔助提升我國機場航廈之營運效率，如推動成功，亦可進一步推廣至其他國際機場，創造更多利潤收益。

## 二. 史基浦機場面臨旅運人口爆炸性成長因應策略-航廈「建設」面

**心得：**在簡報中提及於史基浦機場未來航廈「建設面」中，因荷蘭本身地緣性，未來會加強投資建置生物辨識邊境管控，並加強緊鄰其他歐洲國家等服務，這些新建設施將利用數位方式加強與旅客的接觸連結，並提供高效率的服務。

另外，航廈建設最重要的是結合周邊土地徵收，其中需考量因應旅運成長規劃，土地徵收後各區域建造目的與使用性，(如航廈擴建區域、商業使用區、貨運處理中心、行政中心等)，另外通盤考量機場周邊主要交通幹道，引導週邊區域發展計畫。這些區域周邊發展計畫可結合航空產業，進一步拓展到相關產業連結區域，進一步創造就業機會。因此除考量機場本身的預定用地規劃，仍須考量並周邊如何連結，創造更高之非航空相關之收益。

**建議：**以史基浦機場之營運策略約 70%以上收益皆來自航空延伸之相關商業活動、物流產業，其中商場區域、貿易中心與在其 L 型之主航廈區域穿越其中，安排人流動線穿越，達成非常良好之商業基礎，也創造許多之就業機會，因此在整體商業與航空規劃需務實檢討，並進一步擴大去討論不同時程下我國整體機場鄰近用地規劃，俾利創造更大收益。

### 三. 戴高樂機場利用整合決策系統(A-CDM)

**心得：**透過法國戴高樂機場機場協調整合決策系統(A-CDM)之運用說明，瞭解機場導入 A-CDM 的效益，可促使機場合作夥伴能及時共享營運數據，包括航班起降管理即時資訊、氣候監測預報、其他機場即時情況掌握及機場營運監測等功能，而為了讓 ACDM 能夠精確的運作，任何變動都需要將資訊回饋給透

過 Eurocontrol 所設計的協調整合決策系統委員會等相關單位，避免臨時性之變動，衝擊秩序，以確保狀況掌握，做最妥善之決策，進而優化機場營運效率及服務品質。

**建議：**機場協調決策平台(ACDMP)之建置對機場營運效率之提升至關重要，宜吸取本次研討會的經驗持續精進到 T3 資訊通訊系統工程的設計與規劃，並務實檢討 ACDM 各項指標，有效整合 ACDM 16 個 Milestone 資訊源，對第三航廈各項特殊系統設計持續進行優化精進作業，以面對真實反映之運行模式。

最後，在多次出國參加論壇演講，開場白常常詢問有關台灣及桃園機場的印象，結果常常只是少數人知悉，建議應該藉各種機會出國宣揚，亦同時藉由參與國際場合機會，不但外語能力可以強化，亦可增加自己的視野，了解全世界的機場及相關工作者努力的趨勢及方向，也正是給我們一個非常寶貴的學習機會，回國以後也可將所見所聞傳遞給所有同仁。

## 伍、 附件(本次出席國際論壇簡報)