出國報告(出國類別：考察及國際會議)

# Passenger Terminal Expo 2017 會展暨英國、荷蘭機場參訪

服務機關：桃園國際機場股份有限公司
姓名職稱：曾大仁董事長
王天湘特別助理
廖振志副處長
林東茂高級專員
馮子秋事務員
林柔佑事務員
王引彤事務員
派赴國家：荷蘭阿姆斯特丹
出國期間：民國 106 年 3 月 10 日至 18 日
報告日期：民國 106 年 5 月 16 日

# 公務出國報告提要

| | |
|---|---|
| 出國目的 | 「參加 Passenger Terminal Expo 2017 會展暨參訪英國、荷蘭機場」 |
| 服務機關 | 桃園國際機場股份有限公司 |
| 出國人員 | 曾大仁、王天湘、廖振志、林東茂、馮子秋、林柔佑、王引彤 |
| 人員職稱 | 董事長、特別助理、副處長、高級專員、事務員、事務員、事務員 |
| 出國類別 | □實習(訓練) ■其他 （ □研討會 ■會議 □考察、觀摩、參訪 ） |
| 出國地區 | 英國倫敦及荷蘭阿姆斯特丹 |
| 出國期間 | 民國 106 年 3 月 10 日至 3 月 18 日 |
| 報告日期 | 民國 106 年 5 月 16 日 |
| 關鍵字 | 旅客、航廈、機場、機場設備、會展 |
| 報告頁數 | 91 |
| 報告內容摘要 | 本次公務出差行程為參加 Passenger terminal 會展，會展包括主題演講、展覽展示及 Skytrax 頒獎，民航局及本公司於本次會展中共有 4 篇簡報：「透過促參於機場裝設太陽能光電系統」、「桃園機場第三航站區設計規劃」、「桃園機場藝文展覽合作」、「桃園機場計程車管理(現在與未來)」，不同場次中與國際各機場管理單位亦或是航空相關企業分享與討論。<br>並且把握出差期間赴鄰近標竿機場參訪，針對英國希斯洛機場、荷蘭史基浦機場各機場突出部分重點參訪，例如史基浦機場的航廈規劃、智慧安檢設備及行李自動分檢系統。 |

# 目錄

# 壹、目的

一年一度的「Passenger Terminal EXPO」論壇會展為全世界機場及航空業提供了一個可以互動並分享所面臨之共同問題、未來目標及各種解決方案的國際平台，因此每年論壇會展皆吸引許多國家的眾多活動參與者及參展廠商，並匯集來自世界各地的機場、航空公司、權威機構、監管機構和政府團隊的專業人士，以及機場航業各領域的顧問、建築師和供應商等。

而此次 20 週年論壇會展在荷蘭阿姆斯特丹舉行，論壇主題眾多且會展廠商豐富且可看度高，又本公司受邀於本次論壇大會中進行三項專題演說，並且桃園國際機場獲得 2017 SKYTRAX World’ s Best Airport Staff Award 獎項殊榮，故本次論壇會展由本公司董事長代表領取 SKYTRAX 獎項，並且藉由演說及領獎之機會向全世界各機場代表與航空相關業者宣揚本公司發展之企圖與目標。

另桃園國際機場在 2016 年底正式突破年旅客量 4,000 萬人次大關，已邁入 ASQ 不同的評比級別，同時，桃園國際機場第三航站區設計作業持續推進中，因此特地藉由本次論壇會展地利之便，就近參觀英國及荷蘭境內標竿樞紐機場，以吸取他國機場建設營運成功經驗，並予以優化改良符合本國運用，使桃園國際機場往國際標竿機場邁進。


圖 1 - Passenger Terminal EXPO 2017 Logo

# 貳、參訪行程

| 日期 | 行程 | 人員 |
|---|---|---|
| 3/10(五) | 去程 CI 0073 轉機 CI 9365 桃園-倫敦 | 廖振志 |
| 3/11(六) | 參訪英國希斯洛機場 | 廖振志 |
| 3/12(日) | 搭乘 KL 0994 倫敦-阿姆斯特丹 | 廖振志 |
| 3/13(一) | 去程 CI 0073 桃園-阿姆斯特丹<br>參訪荷蘭史基浦機場 | 曾大仁<br>王天湘<br>廖振志<br>林東茂<br>馮子秋<br>林柔佑<br>王引彤 |
| 3/14(二) | Passenger Terminal Expo 會展第 1 天<br>SKYTRAX 2017 World's Best Airport Staff Awards 董事長領獎 | |
| 3/15(三) | Passenger Terminal Expo 會展第 2 天 | |
| 3/16(四) | Passenger Terminal Expo 會展第 3 天 | 廖振志<br>馮子秋<br>林柔佑<br>王引彤 |
| | 回程 CI 0074 阿姆斯特丹-桃園(3/17 抵達) | 曾大仁<br>王天湘<br>林東茂 |
| 3/17(五) | 回程 CI 0074 阿姆斯特丹-桃園(3/18 抵達) | 馮子秋<br>林柔佑<br>王引彤<br>廖振志 |

# 參、 Passenger Terminal Expo 2017

## 3.1 研討會

Passenger Terminal Expo自1997年成立以來，是國際上有關機場規劃、營運及相關技術發展最具規模的會展之一，今年有來自100個國家、超過1,650位與會者及375位演講者參加，今年的會議在荷蘭史基浦舉行，在為期3天的會展中仍依其慣例分為航空城、機場設計規劃及發展、航空保安、機場商業發展、顧客服務及旅客感受、機場環保與永續發展、機場營運與管理、機場IT系統、增加機場容量等多達11個主題，26場討論會；在展覽部分，吸引超過7,000位與會者及225個參展單位參加，展示機場所需各項相關產品與技術，例如航廈內的座椅、行李處理、安檢設備、螢幕顯示看板、監控管理系統等，以及因應未來可能發展的智慧整合系統均來參展。此外Skytrax對世界機場年度調查評鑑的結果，於會展中頒發，因此每年的Passenger Terminal Expo會展均有來自世界各地機場同業熱列參加。桃園機場今年也於Skytrax評鑑中獲得全世界最佳服務人員及亞洲區最佳服務人員兩項金獎。

桃園國際機場延續在 2016 年的會議中有 4 個簡報之成果，於 2017 年也接獲大會邀請在會中發表了 3 個報告，今年並和民航局一同與會發表。報告主題分別是「桃園機場第三航站區設計規劃」、「桃園機場藝文展覽合作」、「桃園機場計程車管理(現在與未來)」，獲得與會人士之好評，對外行銷桃園機場，並藉此與國際間各機場專業的交流。

「Passenger Terminal Expo」航廈博覽會，每年在不同城市與機場合辦。在為期 3 天的博覽會中，分為設備展及研討會兩大區域，設備展的展場內由與航廈內相關的設備供應商、建築師及顧問公司設置相關攤位，介紹展示最新之產品與軟體服務。

本次 Passenger Terminal Expo會議主題可分為下列11項：

1. 航空城交通及觀光 Airport Cities, Transport Connections& Tourism
2. 機場設計及規劃 Airport Design, Planning and Development
3. 航空保安及邊境管理 Aviation Security, border control and facilitation
4. 商業特許權及零售與媒體 Commercial Concessions, Retail & Media
5. 顧客服務及旅客體驗 Customer Service and Passenger Experience
6. 能源與環境永續發展 Energy, Environmental & Sustainability
7. 機場設施維持及管理 Facilities Maintenance & Management
8. 機場未來 Future Airports
9. 增加機場容量 Increasing Airport Capacity
10. 機場營運管理 Management & Operations
11. 科技Technology

上述 11 大主題研討會共 26 場討論會，分別在不同的會場同步展開，由大會邀請航空界資深經驗之主持人主持，並於簡報發表後，開放與會者討論。

桃園機場今年發表三個報告分別是：

(1) 「科技」主題：Taiwan Taoyuan International Airport T3 Smart Airport Architecture由本公司工程處廖副處長振志報告「桃園機場第三航站區設計規劃」。說明桃園機場第三航廈的設計規劃，未來第三航廈將提供全新的商業服務，並朝綠建築、智慧航廈的方向前進，且現行規劃階段將面對的各項挑戰，包括將第三航廈的未來規劃與第一航廈、第二航廈現有設施設備及營運管理之整合。


圖 3.1.1 本公司工程處廖副處長振志報告

⑵「顧客服務及旅客體驗」主題：Exhibits of Cultural and Artistic Cooperation at Taoyuan International Airport由本公司業務處林柔佑及王引彤報告「桃園機場藝文展覽合作」。說明旅客服務除了硬體設施的精進外，在桃園機場的文化體驗和感受也是我們致力提供給旅客的要項。從櫥窗、機場角落、候機室和行李轉盤的文化佈置，讓旅客更了解台灣。除了主流文化外，尋找特定及獨特的藝術作品，呈現台灣更多面向的特色。與藝術家、藝術團體、公司企業、地方政府合作，提供更豐富，多樣的文化藝術美學體驗。


圖 3.1.2 本公司業務處林柔佑及王引彤報告

(3)「航空城交通及觀光」主題：The Management of Taxis at TTIA (present vs. future)由本公司業務處馮子秋報告「桃園機場計程車管理(現在與未來)」。說明桃園機場雖然是機場管理者但非計程車公會的主管機關，並試圖透過修法來改善計程車的管理方式，以提供旅客更好的服務，提升旅客搭乘計程車的滿意度。

圖 3.1.3 本公司業務處馮子秋報告

## 3.2 Skytrax 機場評鑑頒獎典禮

英國非營利獨立調查機構 Skytrax 是全球最權威的航空評比機構，於 1999 年開始，調查旅客對於機場報到、出入境、安檢、購物等意見。旅客自行於該公司網上填寫問卷。2000 年調查收集了 100 萬份全球旅客問卷，之後每年問卷數持續成長，本年度評比共收集 105 國 1,382 萬份旅客問卷，調查範圍包括世界 550 座機場。Skytrax 調查與頒獎過程都由該公司獨立出資，因不受外部贊助或影響，評比結果客觀，被譽為「旅客的選擇」(Passenger's Choice Awards)，極受業界重視。

該機構也與本會展結合，於會中舉行年度機場頒獎典禮。今年桃園機場因獲得「世界最佳機場服務人員(World's Best Airport Staff

Service)」及「亞洲最佳機場服務人員(Best Airport Staff in Asia)」兩項冠軍，本公司董事長曾大仁親自出席頒獎典禮，領取雙料冠軍獎牌。

桃園國際機場獲得此兩項大獎，除了表示服務水準已達世界標竿，更代表台灣擅長的軟實力備受國際肯定。除了機場服務人員兩大首獎之外，桃園國際機場在 Skytrax 世界最佳機場名列第 21 名，世界最乾淨機場名列第 4 名。

Skytrax 2017 獎項與排名詳見官網：

http://www.airlinequality.com/news/best-airports-of-2017-unveiled-at-world-airport-awards/


圖 3.2.1 本公司董事長曾大仁從 Skytrax CEO 手中接下全球最佳機場服務人員大獎

## 3.3 展覽會場概況

今年會展的展覽區共有225家廠商參展，從航廈內的各式椅子、自助行李託運、智慧安檢系統、電子看板、吸菸室、安檢盤自動回收設備等，有硬體設備也有軟體整合系統。越來越多與手機結合的APP無線運用系統或設施，也吸引全球各航空產業及機場單位來此蒐集市場上

最新的發展科技，並尋找適合採購的設備。


圖3.3.1用於航廈內各式椅子


圖3.3.2遠端遙控機器人（左）及供旅客使用之睡眠艙（右）


圖3.3.3內設獨立空調之吸菸室（左）及安檢托盤自動回收設備（右）


圖3.3.4電子看板（左）多功能旅客資訊互動式看版（右）

圖3.3.5智慧自動安檢系統設備

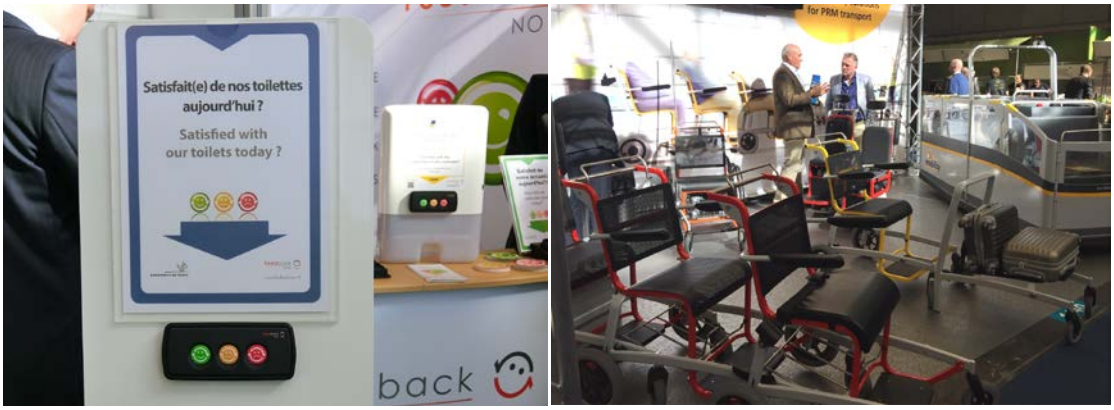


圖3.3.6滿意度調查簡易按鈕（左）及附行李架之輪椅設備（右）

# 肆、英國希斯洛機場

## 4.1 緣由

本次目的地是協同業務處同仁赴荷蘭出席「Passenger Terminal EXPO 2017」 會展專題發表，向國外廣為宣傳我們機場正在興建第三航廈，並適時展示目前設計進度及成果，希望國外所有潛在廠商能來參與未來競標，尤其在特殊系統及資通訊系統方面。同時，亦希望藉由此次機會看看目前最新科技潮流趨勢以及了解全世界各大機場目前建設進程，並與他們作適當資訊交流並建立良好友誼關係。

由於第三航廈建築結構的細設顧問是由英國RHSP建築師事務所及ARUP奧雅納工程顧問負責設計，而英國HEATHROW (希斯羅)機場亦是RHSP建築師事務所設計，因此特別向公司申請順道赴英國HEATHROW機場參訪，看看他們過去的作品，期望未來第三航廈完成的時候，在國際建築大師的操刀下，亦能產生曠世鉅作。以下簡單報告此次英國參訪時之所見所聞。

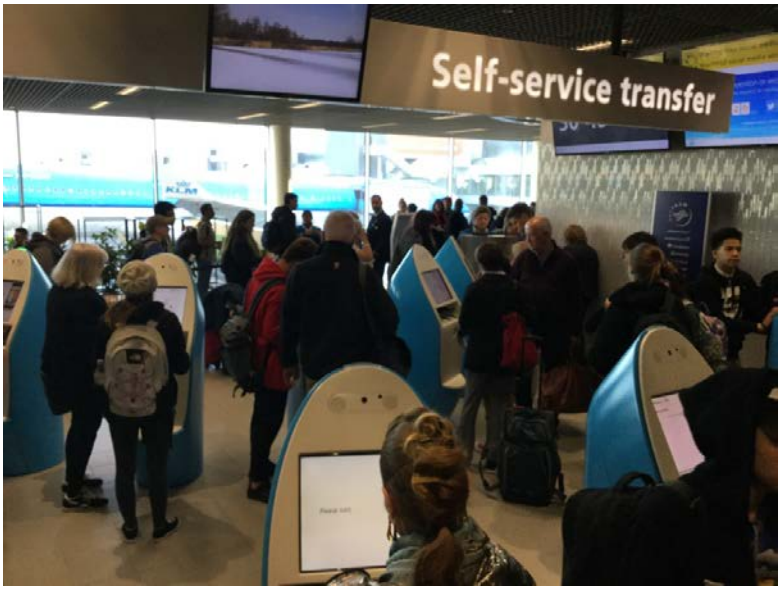


圖4.1.1荷蘭轉機至英國

## 4.2 荷蘭轉機


圖 4.2.1 荷蘭轉機櫃台

現在很多標竿機場對旅客體驗均很用心，舉凡荷蘭 Schiphol 機場，英國 Heathrow 機場等，如上圖所示，旅客不但可以自己利用 Kiosk 自助印出機票，亦可以人工排隊辦理轉機，牆壁上 FIDS 就會顯示出從該處到人工櫃台所需排隊等候時間，好讓旅客心裡有所準備，亦或讓旅客可以改採使用 Kiosk 自助機器，可以適度分散排隊等候的旅客人流。

## 4.3 Heathrow 機場配置

Heathrow機場位於倫敦西南方，目前除第一航廈封閉整建外，第二航廈至第五航廈均正常營運，航廈間均有免費機場快捷(Heathrow Express)及倫敦地鐵串連(如下圖)，約每15分鐘一班，與我們桃園機場捷運的班距相當，仍屬便捷。

目前第二航廈主要航空公司為星空聯盟(Star Alliance)，第三及第五航廈主要為英國航空(British Airways)進駐，第四航廈則主要是天合聯盟(SkyTeam)在經營，屬於一航廈一聯盟配置，營運上相對較有效率。

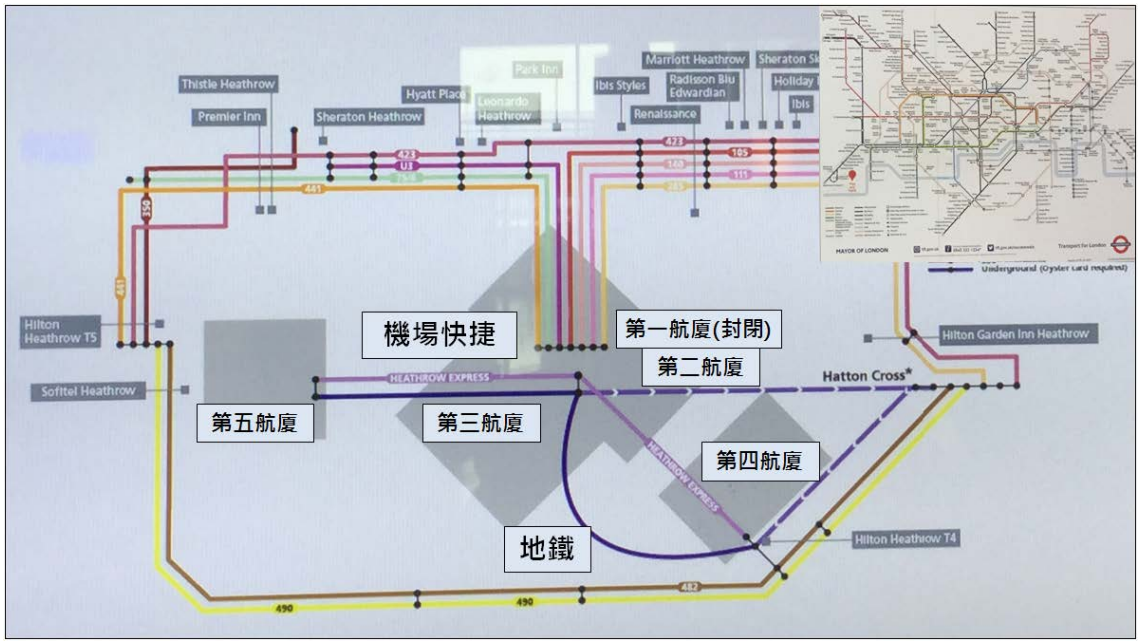


圖 4.3.1 Heathrow 機場全區配置圖

## 4.4 Heathrow 機場資通訊系統(ICT)之資料結構

此次參訪Heathrow機場主要希望能達到三項目的，第一是拜訪機場公司ICT人員，以瞭解他們在ICT方面資料結構處理過程，第二是參觀他們的空橋以及橋氣橋電方面的使用經驗，第三則是參觀各航廈，希望藉此了解先進機場當初航廈是如何規劃。

首先，在資料處理方面，Heathrow 機場具有7300萬年旅客量，亦是歐洲最繁忙機場，機場共有3000多FIDS設備，1000多個BRS scanner，為80多個航空公司提供行李服務。光是T5航廈每天就超過10個樓控管理系統(BSI)資料傳輸。他們資料結構是採用SOA (Service Oriented Architecture)架構，也就是以服務為導向，機場所有業務數據採模塊化及標準化。

為什麼他們要採用這種架構呢？因為約十二年前，他們發現系統越來越多，越來越亂而且繁雜，越來越無法管理、擴充或增加新功能。

所以他們決定將後台AODB與前台用戶端關係由緊密耦合(close couple)轉為中間加上SOA平台來負責所有數據分發及管理的鬆耦合(loose couple)結構，通過這個結構，使得機場擴充，新舊系統對接變得容易，並解決機場業務擴大後，系統複雜性問題，進而有效管理這麼大的機場而不出錯。

而資料結構建立應以機場角度，自上而下考慮用戶端需求，以達到最有效率的分配及管理。

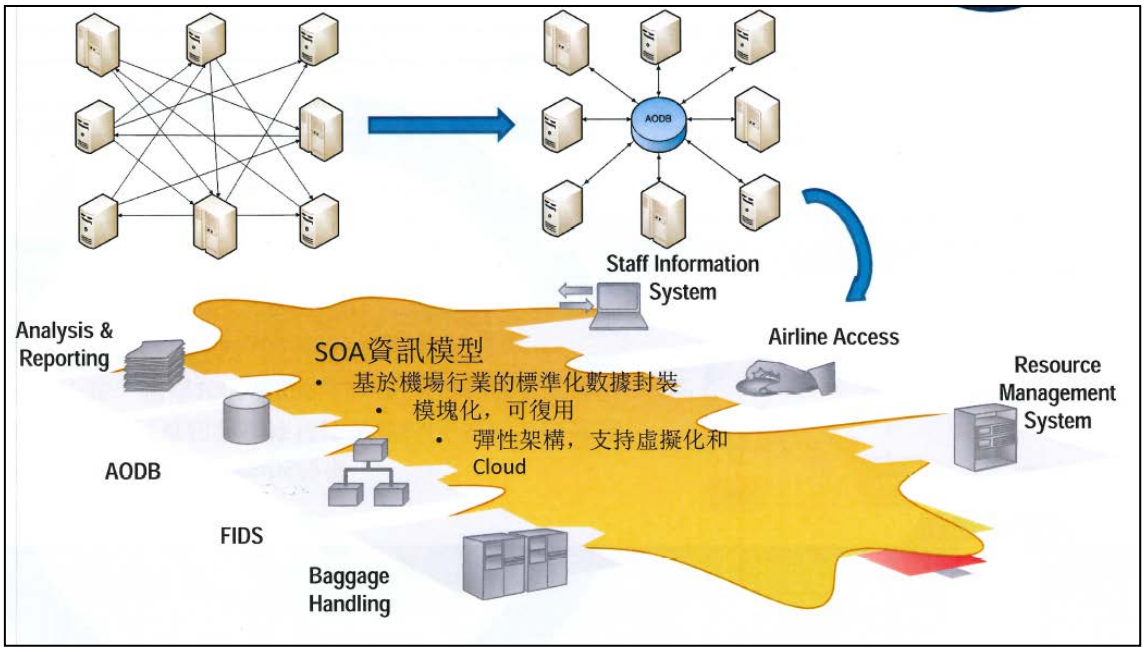


圖 4.4.1 ICT-資料結構探討

## 4.5 Heathrow 機場旅客空橋設備及橋氣橋電裝置

由於目前我們機場的風管屬於軟管，並未金屬加勁，根據操作人員經驗，往往風速超過20KTS就無法操作或須出動大批人力方能完成，而我們在設計T3航廈過程中，聽取機場公司維護處的經驗，因為清潔不易的考量，排除了於機坪底下埋管方式(日本機場常用)，而採用金屬

線圈加勁軟管設置於空橋下之方式設計，以防止操作時受風力影響。參訪完後可以確認的是，我們設計的方向應是可行的，未來尚待統包商進來後再進一步優化。

因為英國機場位於高緯度，平均溫度偏低，所以並非所有空橋均配有橋氣裝置，且空橋升降柱採用油壓式，而我們因位於亞熱帶，目前升降柱採機械式，未來升降柱是否可採用油壓式仍須進一步詳細探討。

另外，歐洲因雨季比較少，所以對空橋設備防護亦比較少，我所關注的空橋防鏽處理則尚未多加著墨，像固定橋及活動橋間防水及防止冷氣外漏裝置只作一道，我們目前空橋設備均作二道。另像空橋監控設備CCTV及安全靴及通用設施均為選配亦是與我們目前機場營運方式有很大不同。而這在我們T3設計上也是必要配備，以避免未來航空公司與地勤人員不必要的糾紛。

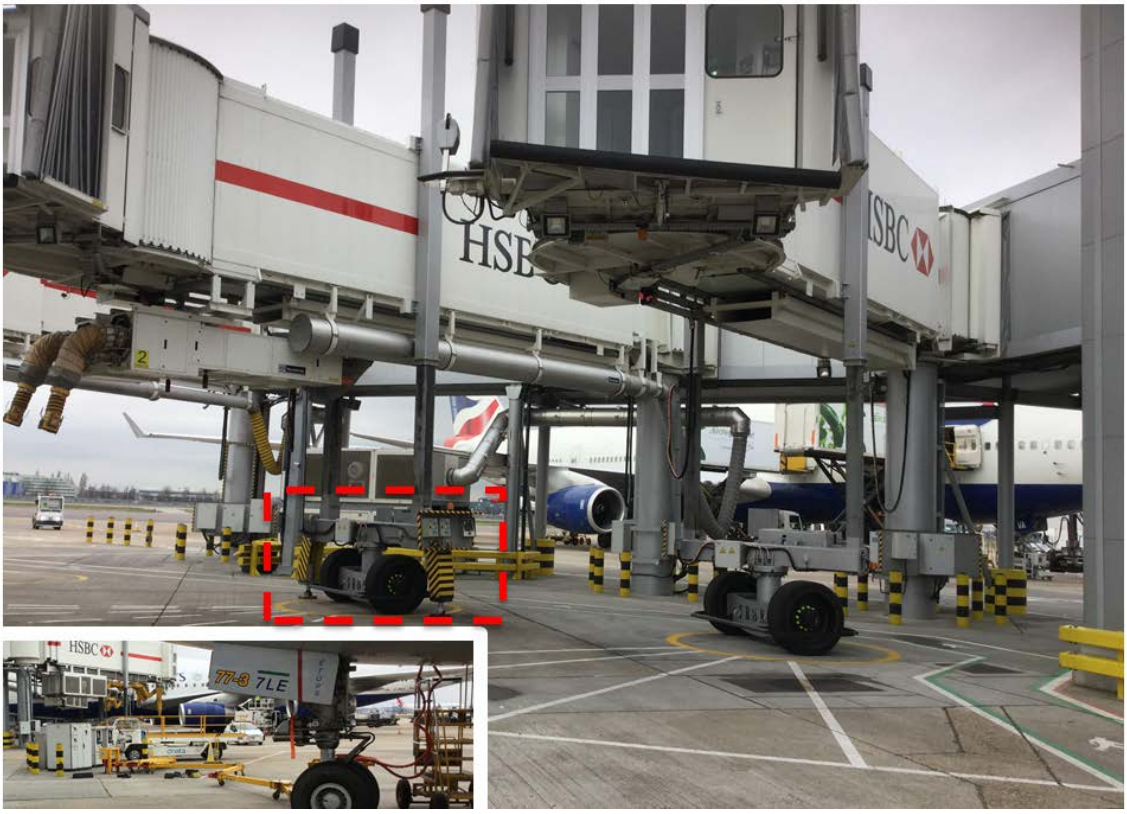


圖 4.5.1 旅客空橋系統-橋電設備


圖 4.5.2 旅客空橋系統-油壓式升降柱（左）及風管操作盤（右）


圖 4.5.3 空側及陸側全面採用電動車

# 伍、荷蘭史基浦機場

## 5.1 機場簡介

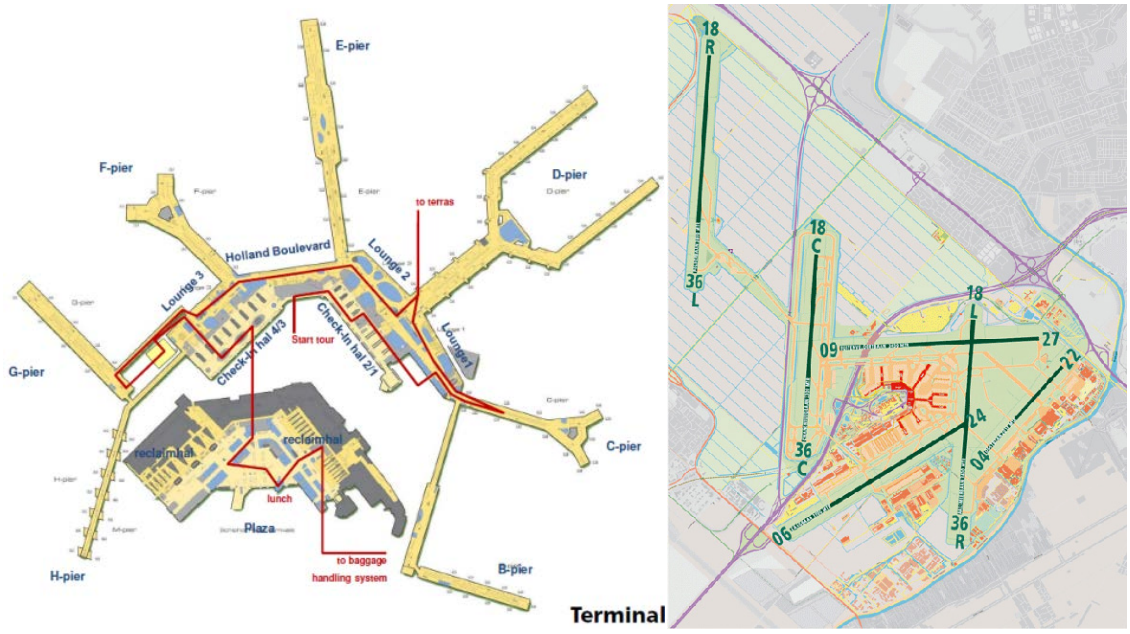


圖 5.1.1（圖片來源：史基浦機場網站）

荷蘭史基浦機場（Schipol airport）是由Schipol集團所有，亦是歐洲第三大機場，其2016年年客運量約為6,362萬人次，貨運量約為1,700萬噸，及超過47萬飛航班機起降次數。

史基浦機場共有6條跑道，航廈平面配置係以中間區域的商場為中心，像各方向發展出不同航廈（Gate），航廈間有通廊可互相連接。由於航廈前下面就是火車站，市區內傍晚就結束營業的模式，讓民眾甚至願意搭火車前來購物、用餐及休憩，因而形成一個廣大的娛樂圈。

本次參訪荷蘭史基浦機場由NACO的Edwin Maarseveen先生及Peter Toering先生陪同進行各項導覽與解說。

## 5.2 機場設施

史基浦機場入境大廳搭乘手扶梯往下層樓即是火車站月台，且有9292 APP供旅客及時查詢各班車時間資訊，為旅客在機場聯外交通方面提供極大的便利性，可作為未來興建第三航站區的參考。


圖5.2.1火車站月台照片及刷卡機照片

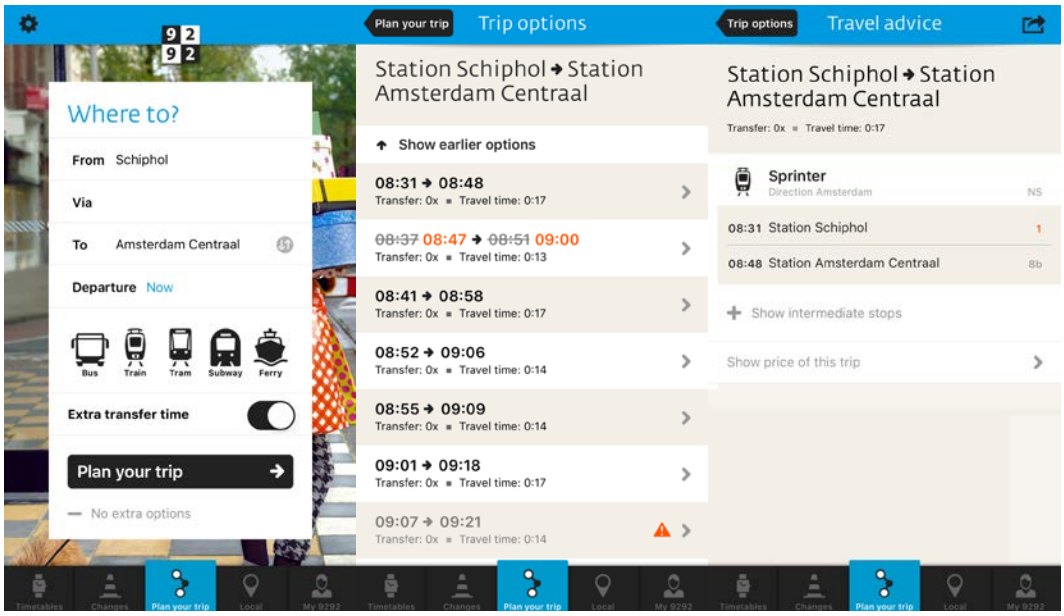


圖5.2.2 9292 APP照片

垃圾桶設計具巧思，除可節省放置空間，丟擲時易較不易感到髒亂感，擬人化標語，使丟垃圾也能是件開心的事。藉由於時鐘鐘面上播放預先拍攝好之視頻，彷彿真人位於鐘內刷新時刻，讓時鐘的功用不再只是播時。


圖5.2.3垃圾桶（左）及時鐘（右）


圖5.2.4管制區內的餐飲區及商店



圖5.2.5與當地文化融合之商店及裝置


圖5.2.6航空公司報到（左）及資訊提供服務中心（右）


圖5.2.7報到區旅客專用通道（左）及手推車自動輸送系統（右）

圖5.2.8賞機觀景平臺（左）及飛機模型展示（右）

## 5.3 標誌

標誌設計內容以黃底黑字，箭號部分白底黑字，主要訊息為英文，次要訊息另外加註荷蘭文。標誌設計考量，黃底設計於機場中較為顯眼，主要語言使用英文可減少訊息混雜程度。危險物品宣導事項於報到櫃台上方使用FIDS電子看板顯示宣導事項，較放置實體展示櫃更為適當。

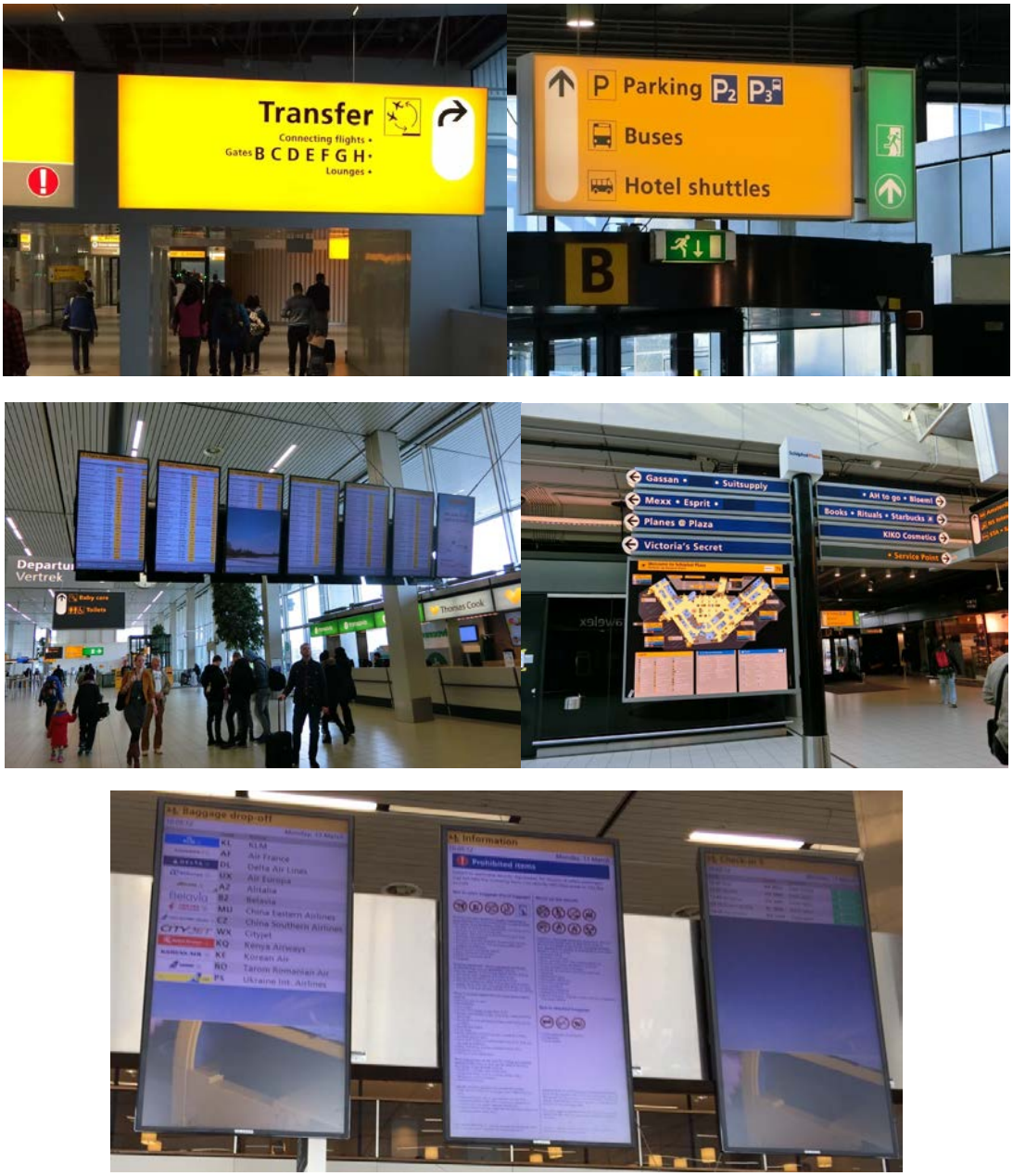


圖5.3.1標誌及FIDS電子看板

## 5.4 安檢通關

出境安檢區域中央安檢系統設備以明亮空間及溫暖木質色調增加空間舒適感，減輕安檢過程緊張氣氛；並設有智慧人體全身掃描儀，全面使用全身掃描儀，更全面進行檢查，除引發之隱私問題外，旅客需站定正確檢查位置，較花時間。而智慧安檢行李流程及設備有較大的空間配置，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。

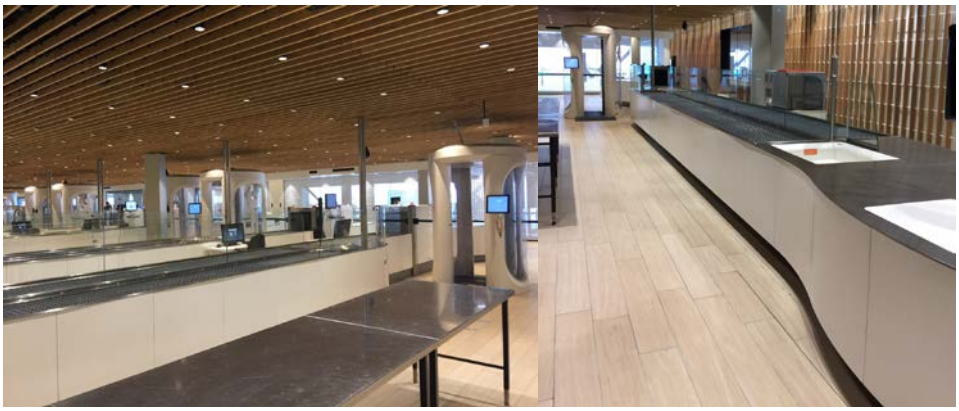

圖5.4.1出境安檢區中央安檢系統設備

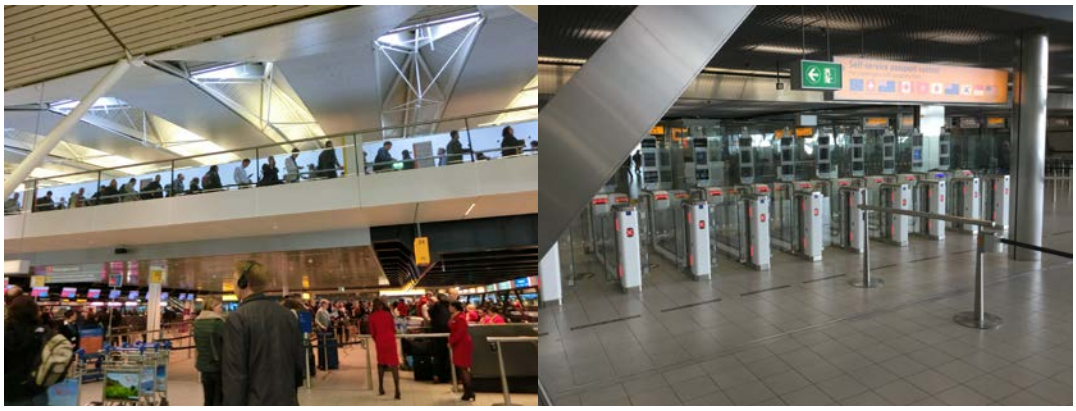

圖5.4.2出境安檢區位於出境大廳上方（左）自動通關設備（右）

# 陸、心得與建議

## 6.1 Passenger terminal 會展：

本次的會場舉辦於荷蘭阿姆斯特丹國際會展中心，藉由會場中展示的各類與機場旅客服務相關之設備(施)及系統，例如躺椅、安檢設備、吸菸室、睡眠艙、BHS 系統等，提供各航空運輸相關業者及機場管理者提升機場服務之參考。

此會展每年展出多項與機場相關內容與產品，並有各種議題的簡報分享，透過學習其他機場的經營管理，快速的吸收他人成功經驗。

展場展示之 Self-boarding gate(自助登機登機設備)旅客可自行刷登機證登機，減少登機門地勤人力。惟囿於臺灣受限於法規無法適用於出境登機安檢，因此使用在登機前較不適合。荷蘭史基浦機場於出境安檢前使用自助刷登機證系統，速度快且可減輕人力負擔。由於桃園機場航空公司曾反映於轉機安檢區前未有登機證檢查機制，導致旅客無登機證即進入出境區域。未來可評估將此設備運用於轉機安檢，用以解決本場轉機安檢區因無檢查登機證之作業程序，導致無登機證轉機旅客可能誤闖至出境之問題。

## 6.2 Passenger terminal 研討會：

藉由研討會與世界各國航空運輸相關產業及機場管理者相互交流，透過簡報及提問之過程，學習他方經營管理上之優點、方法及目前所遇到的問題與解決方式，有助於提升本場整體服務品質及航廈相關設施(備)改善之參考；此外，亦透過研討會之方式，使其他會議參與者看到我國對於提升機場旅客服務之努力，達到國際行銷及宣傳效果。

例如在介紹機場藝文展覽合作之簡報，被提問是否提供旅客意見回饋的方式，作為之後與相關團體繼續合作的考量或能知道這些藝文

展覽對旅客的印象。此提問提醒未來桃園機場在展覽方面可以增加意見回饋的思考，能夠更能了解相關的合作的效益。

另外，參與研討會過程藉由各機場的介紹，提供新的思維方式。德國漢堡福爾斯比特機場提到機場準時率等問題，機場飛航業務之運作乃由機場全體單位各司其職，互助合作之下始能順利運行。其認為影響因素囊括眾多機場作業層面，與機場各單位有著環環相扣之密切關聯性。包含飛機準備作業、旅客抵達登機門、報到程序、安檢時間…等眾多因素。如欲機場營運運作順遂，除需仰賴與各單位間之默契合作，不管旅客或工作人員，每個人都要有「準時」的概念，才能讓準點率能夠順利達成。可以透過機場各單位互相支間廣泛地溝通，經由數位科技及資訊分享，始能達到資訊及決策整合之目標。

新加坡樟宜機場為了解決尖峰時刻大量的計程車向外阻塞主要道路。依照五個設計標準興建計程車等候區，以容納最大數量計程車、環境保護、增加計程車司機之福利、提供有效率的排隊系統及工程期間不影響計程車營運。藉由新計程車等候區可望改善計程車排隊不再延伸至公共道路上，以提升安全。等候載客時可關閉引擎省油並降低環境污染並減少排隊動線縱橫交錯與插隊情形。另外司機可選擇休息與等待，以各項設施提供舒適的休息空間。

## 6.3 史基浦機場參訪：

安檢流程通常是嚴肅令人感到緊張的地方，史基浦機場從報到、安檢通關至登機過程，整體環境及柔和的裝潢色調給人寬敞、安心的感覺。安檢排隊人數雖多，但是透過人體智慧安檢及分流的方式使得安檢作業順暢、快速。另外，安檢設備之安檢托盤，以自動化設備進行回收供旅客使用，與現行桃園機場利用人力回收相比，減少工作人員來回走動， 提供更舒適的安檢流程。

手推車的回收與管理是桃園機場目前硬體設施無法突破之問題。第二航廈手推車回送手推車至行李轉盤時有樓層轉換與旅客人流交織問題，常常於入境大廳必須小心作業避免影響旅客。史基浦機場於行李轉盤處利用手推車自動輸送系統，將手推車直接回送。除了降低手推車樓層運輸時的危險性，避免與旅客動線交錯也增加回收效率。

桃園機場運量逐年提升，於尖峰時刻常有出境大廳人潮壅擠的狀況。史基浦機場於報到流程中，特別規劃只有旅客可通行的報到通道，進入通道會事先檢查已辦理自助報到之登機證或設置活動機台檢查是否為搭機旅客，避免其餘人士滯留於此區域，旅客完成報到後直接往安檢區域前進，減少旅客與送機人員在管制區外的時間以維護整體秩序。

# Philip Liao

# Frank Lin



*Outline*

1. Introduction
1. BHS-Baggage handling system
2. PMS-People Move System
3. ICT-Information Communication Technology
4. Conclusion

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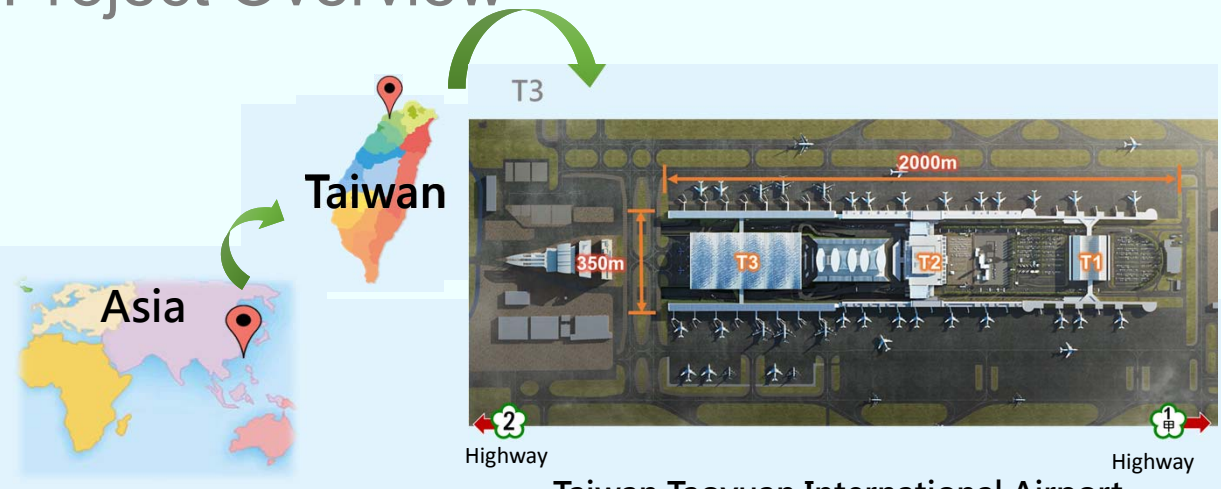
# Introduction of Taiwan Taoyuan International Airport T3



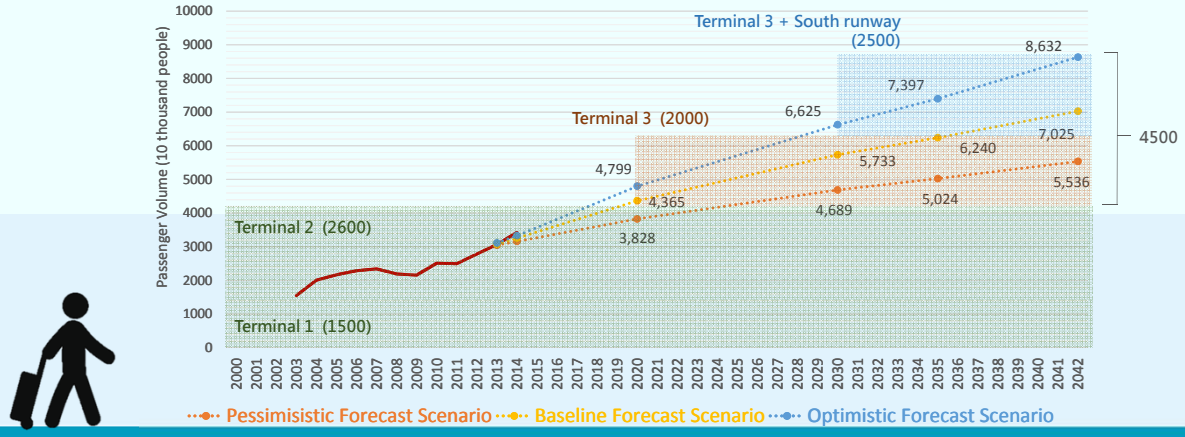
## Project Overview




Taiwan Taoyuan International Airport

# Project Overview - Airport traffic volume analysis

## 2042 to Provide Service Demand 8,600 (100,000 People / Year)





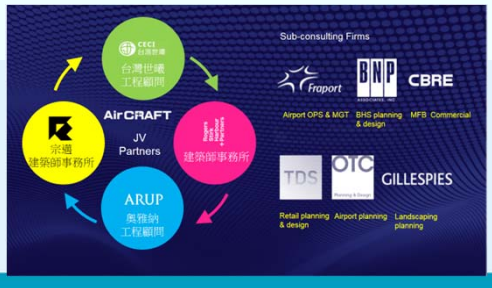



# T3 Team

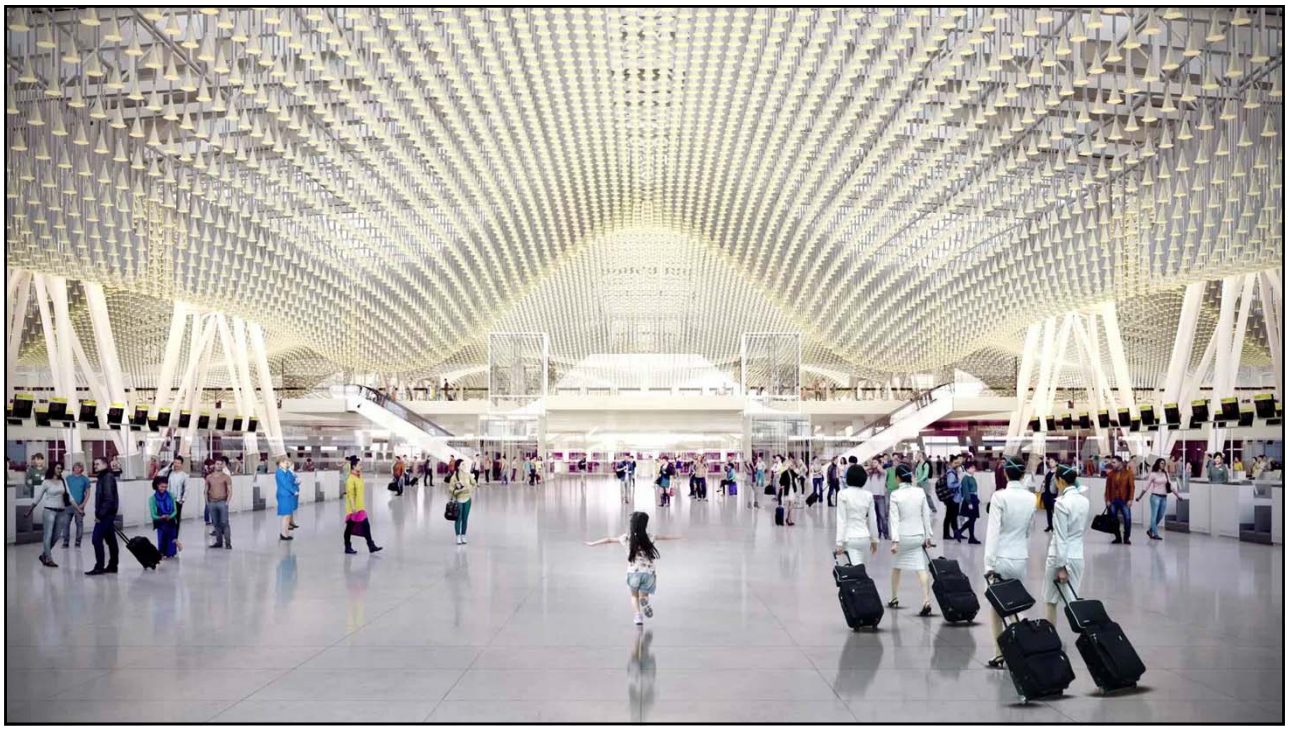
## Taiwan Taoyuan International Airport

NACO NETHERLANDS AIRPORT CONSULTANTS B.V. | PARSONS BRINCKERHOFF | 林同棪工程顧問股份有限公司 TYLIN INTERNATIONAL TAIWAN

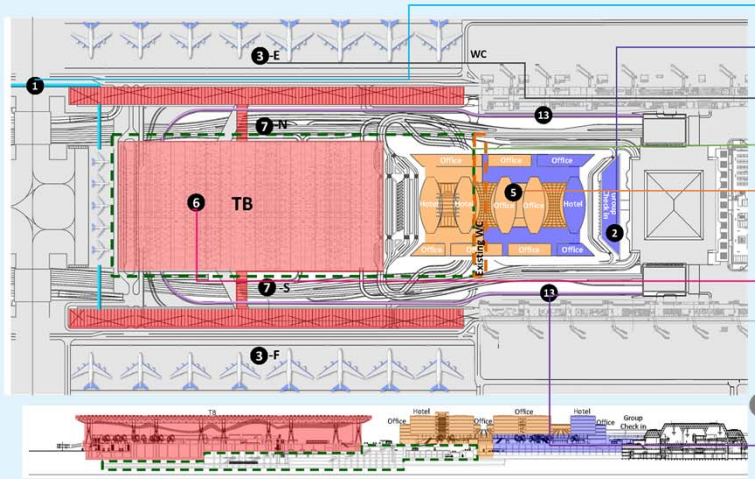
**GC Team**




**DDC Team**



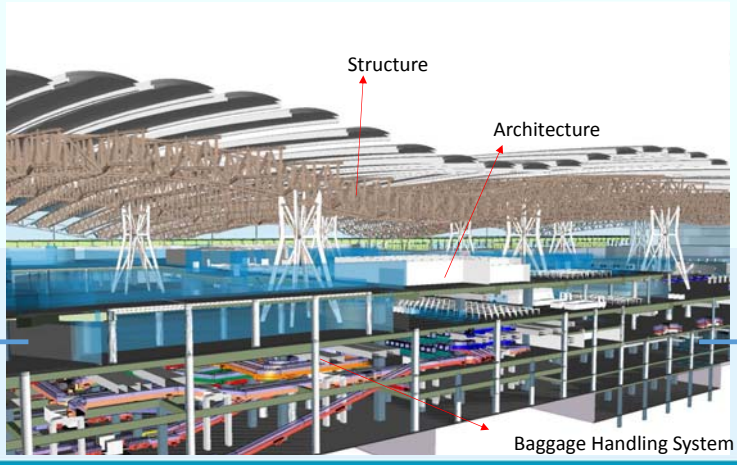
# Sectioning of Contracts




1. UUC & TB Earthwork
2. MBE
3. Apron
4. TB Foundation
5. MFB
   Existing WC Foundation
6. TB
7. Access road
8. Utility
9. ~12. Specials.
13. PMS



# Implement BIM on the Terminal 3 project




ICT ← → PMS

# The Story of Baggage handling system(BHS) for Taiwan Taoyuan International Airport Terminal 3 Area



## *Outline*

- Baggage Handling System overview
- Departure System
- Baggage Screening – Dangerous & Explosives
- Arrival System
- Tender strategy

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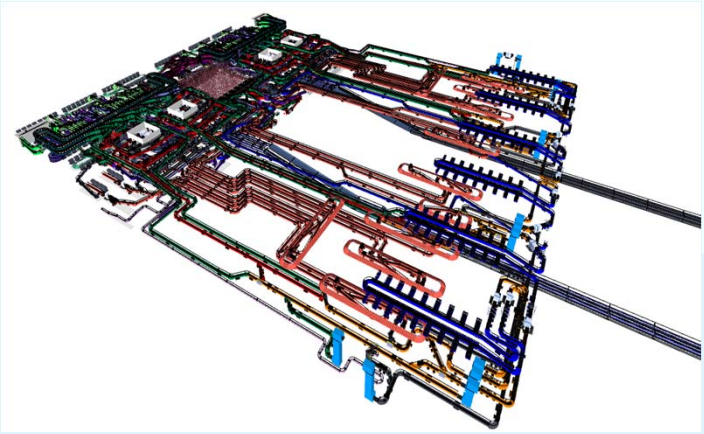
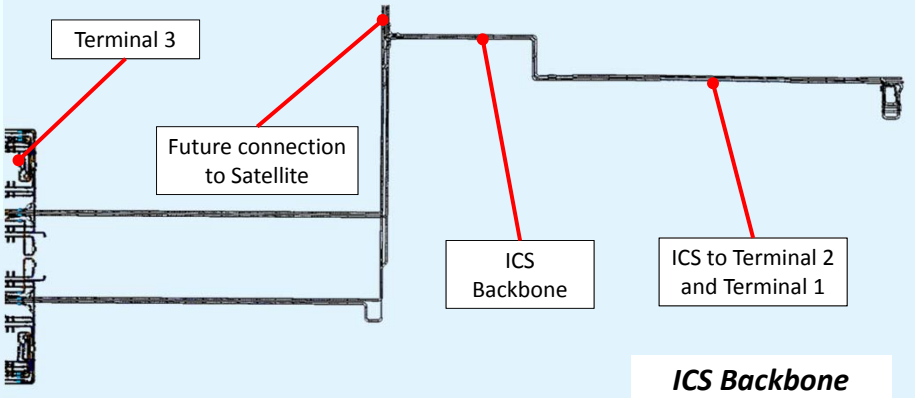
# Baggage Handling System



- **Departure System**
  - Capacity : 10,098 bph
  - Designed to handle golf bag up to **1.2m** length
  - 12 check-in rows, 204 counters
  - 12 Standard 2 machines & 4 CT machines for dangerous goods and explosive screening
  - 4 tilt tray sorters (994m)
  - 24 make-up carousels
  - Automated Individual Carrier System (ICS) Early Bag Store capacity of 3000 bags
  - Integrated link with MRT from City Check-in
  - Integrated backbone via ICS between Terminal 1,2,3 and future Satellite
- **Arrival System**
  - 22 Arrival line with customs screening
  - 12 Arrival carousels

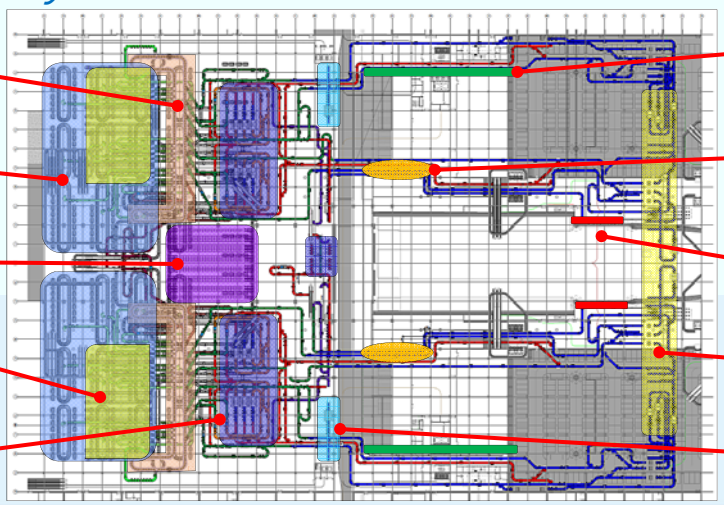


# Baggage Handling System



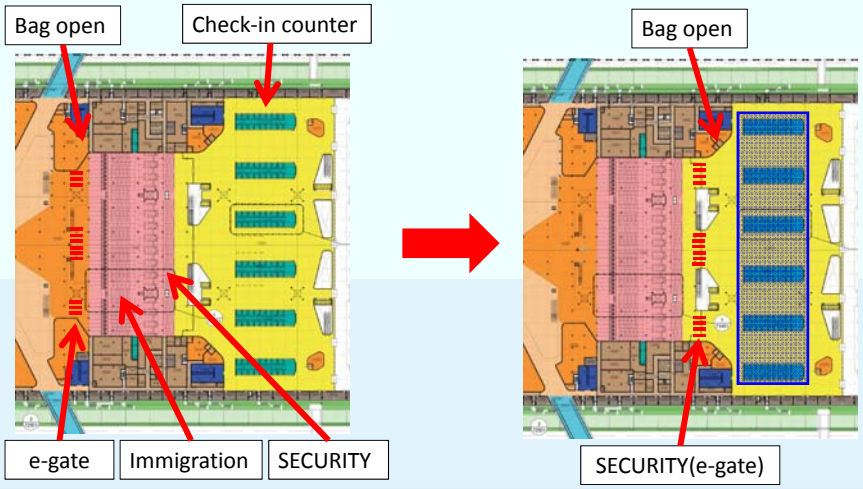

***ICS Backbone***

## Departure System






## Baggage Screening

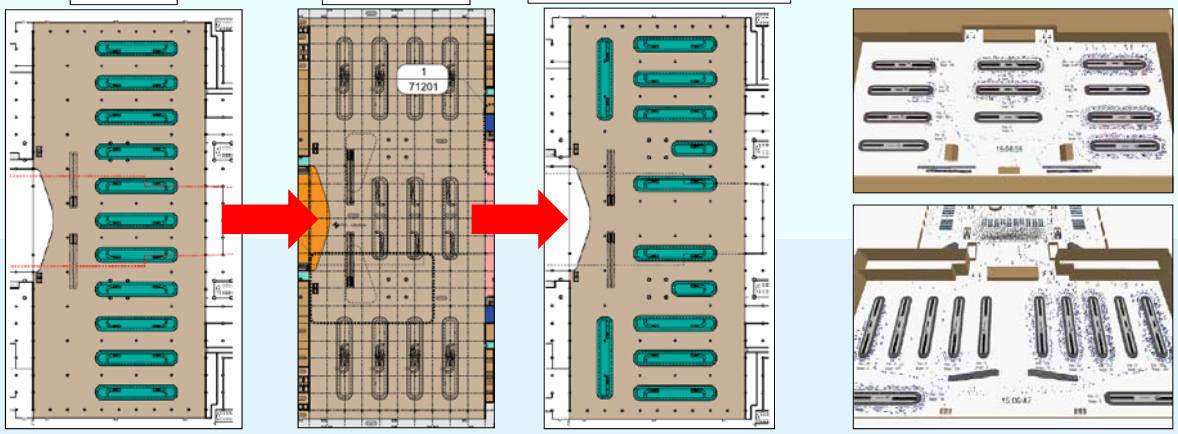


## *Arrival System*

Planning

DC Proposal

GC Compromise design





# The story of People Move System (PMS) for Taiwan Taoyuan International Airport

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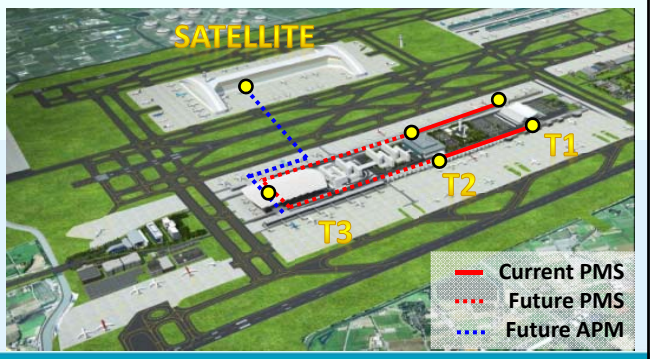
# Outline

- Project Overview
- PMS Introduction
- APM Introduction



# Project Overview

- There is an existing People Mover System (PMS) connecting between Terminal 1 and 2 to service transfer passengers in Taiwan Taoyuan International Airport (TTIA), launched from 2003.
- A new PMS is planned for T3 Terminal to link Newly-built Terminal 3 and Existing Terminal 2, in order to provide Control District (Dep. & Arr.) passengers transport demand.
- Promoting the whole service quality of the Airport, transport service shall be high quality in Control District, so that the Project Goal of "Shortest Transfer Time in Asian-Pacific Area" can be reached.
- The plan of TTIA T3 Terminal Area Project is anticipated not only to build new section but also to integrate and link three Terminals in a single system.
- The Development Blueprint in TTIA is like the right image:

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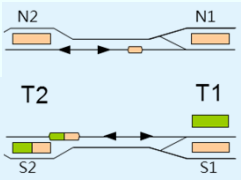
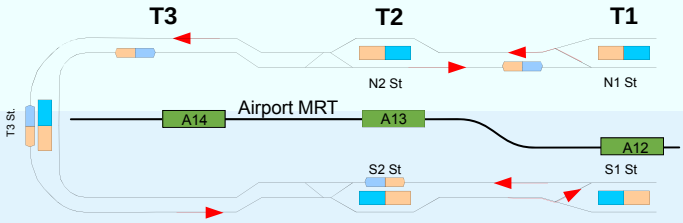
# People Mover System Development

- Current (Airport MRT does not complete): 2 mode in south PMS (land side & air side service)
- Airport MRT and T3 complete:
  - PMS: Air side service (Departure & Arrival)
  - Airport MRT: Land side service




Current



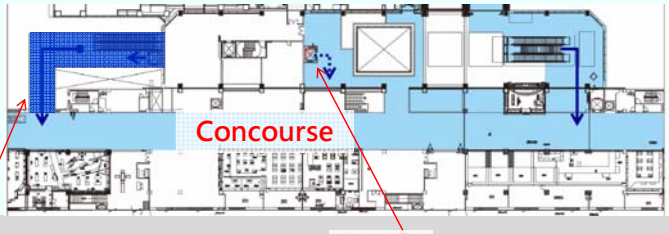

Future

Air Side Dep.Platform
Air Side Arr. platform
Land side platform



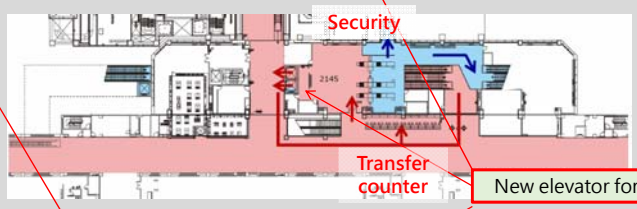
# Platform Reconstruction

3F
Departure Level



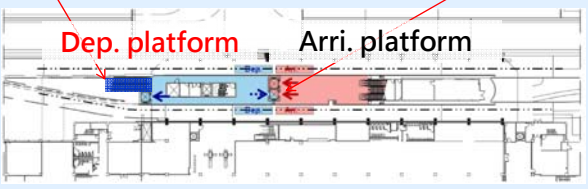

New corridor & escalator

2F
Arrival Level



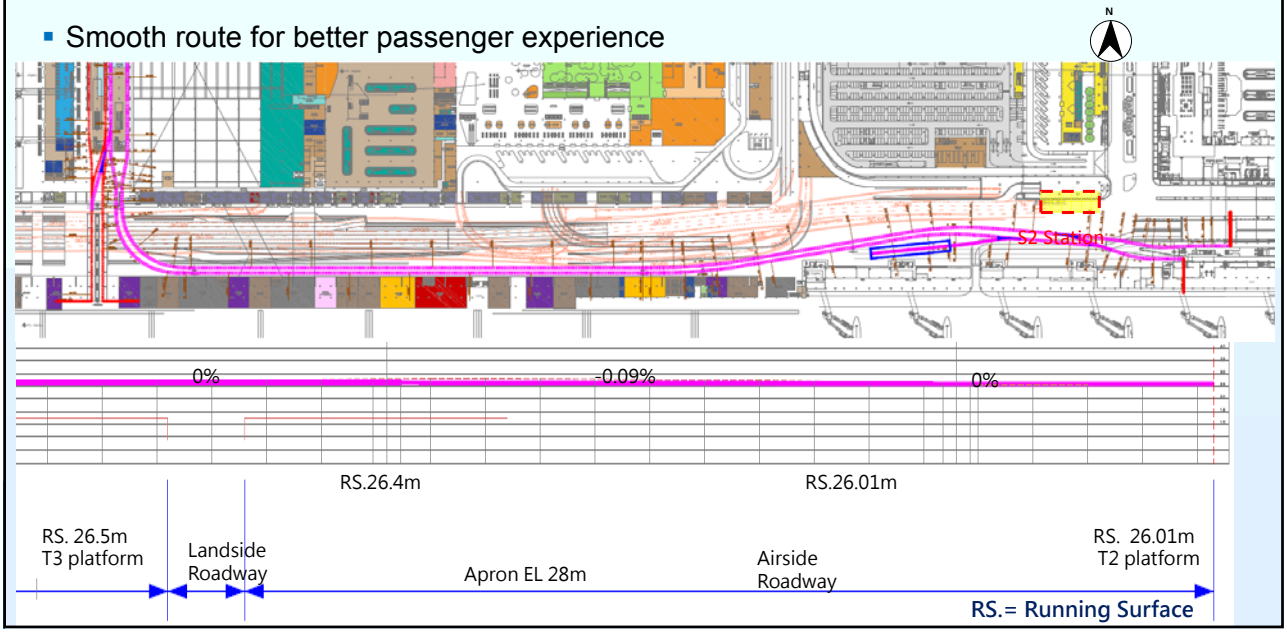

New elevator for redundant

1F
Platform Level



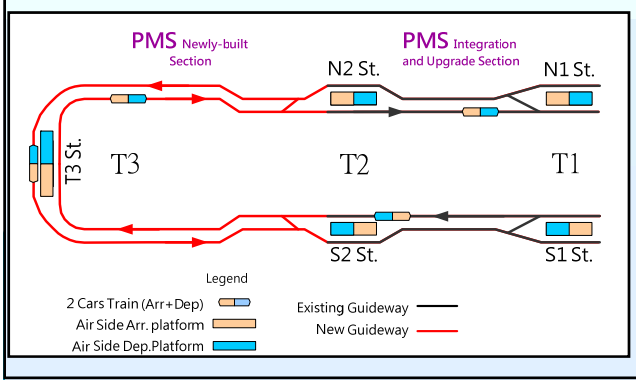
# PMS Newly-built Section (Vertical Alignment – T2-T3 South Side)

- Smooth route for better passenger experience

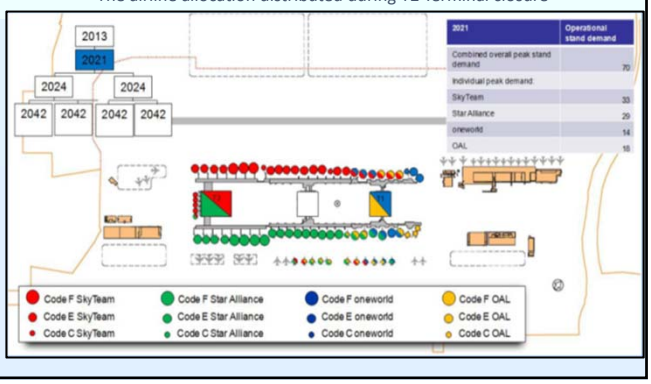



# PMS Transport Demand - for T2 Terminal Closure and Renovation

- In operation initial years, a scenario in Years 2021~2023, PMS will offer huge transport demands for arrival and departure OD Passengers.
- The airline allocation distributed as "North vs. South" during the T2 Terminal Closure Stage.
- The PMS shall be designed to provide transport demand for both OD and Transfer passengers.



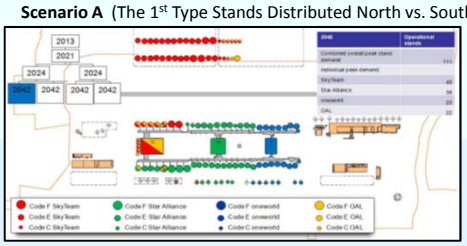

The airline allocation distributed during T2 Terminal closure



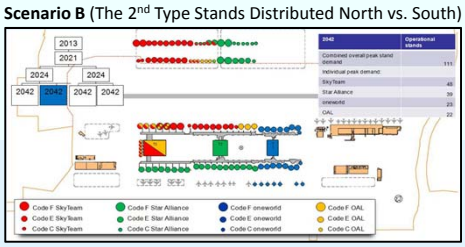
# 4 Possible Scenarios of Capacity Demand in Design Year 2042

- The airline allocation distributed as "Focusing on the Terminals" or "North vs. South" after T2 Terminal re-opening, the ridership demand at Peak Hour will be quite different.

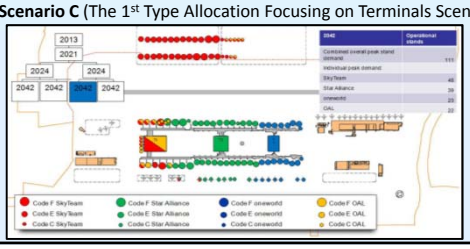
**Scenario A** (The 1st Type Stands Distributed North vs. South)



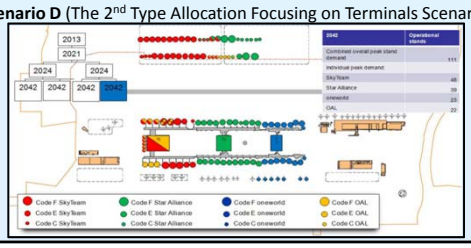
**Scenario B** (The 2nd Type Stands Distributed North vs. South)



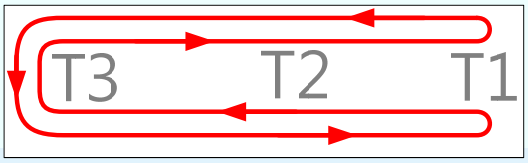
**Scenario C** (The 1st Type Allocation Focusing on Terminals Scenario)



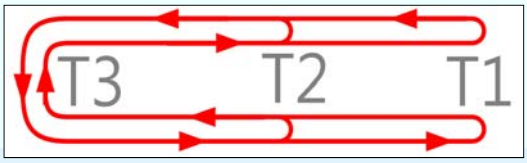
**Scenario D** (The 2nd Type Allocation Focusing on Terminals Scenario)



# Plan of PMS Headway and Transport Demand In Y2024




- Headway : 4 min.
- 5 trains in operation at Peak hour

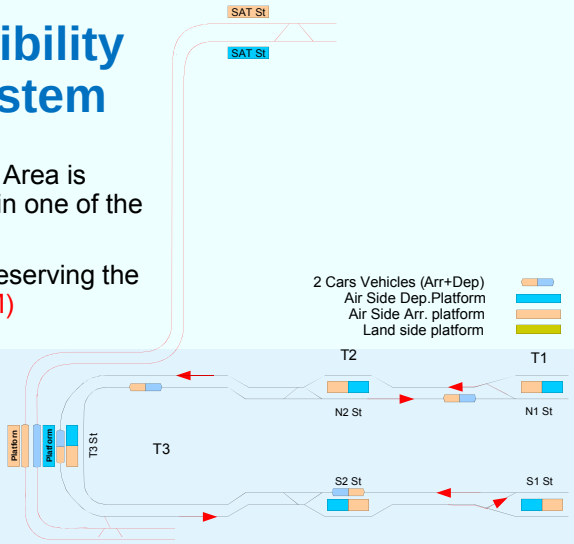



- Headway :
  - T1-T2-T3: 4 min.
  - T1-T2: 2 min.
- 8 trains in operation at Peak hour

(IF T2 is in renovation stage.)

# PMS Development - the Feasibility of Extending PMS to APM system

- A Satellite Terminal located in the north side of Airport Area is planned, all its passengers will have to be processed in one of the 3 Terminals at TTIA.
- Linking Terminal 3 to the future Satellite, the work of reserving the required interface for an additional PMS (named APM) constructed in the near future is included also.
- APM operation schemes: The train Fr. SAT to T3 (carrying Arr.), after safety screening at tail track, turn to carry Dep. PAX.

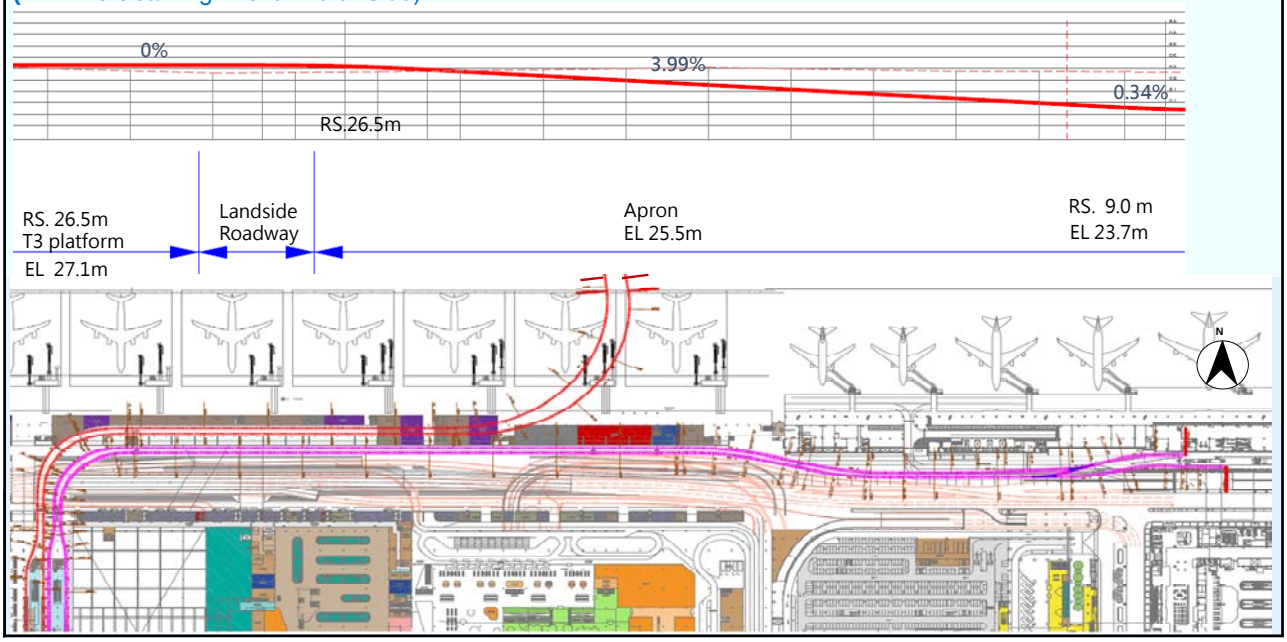





# A Section of Guideway Shell for APM

**(APM Vertical** Alignment –North Side)

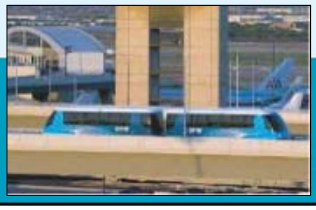
RS.= Running Surface



# Purchase Open to Rubber Tire System

- **Tender Strategy:** Tender with Most Advantageous to TTIA
- **Adopting System Technology:** Full-automatic rubber tire vehicles systems, such as
  - Bombardier Innovia 300、
  - Simens AIRVAL、
  - Mitsubishi Crystal Mover
  - IHI-Niigata NTS
  - Others

Centre Guiding Sys.



Centre Guiding Sys.

Side Guiding Sys.

Side Guiding Sys.

# Smart Airport Concept


Airport Collaborative Decision Making (ACDM)
Smart Airport
Airport Operation Control Centre (AOCC) Working at One
FLIGHT CONTROL
Traffic Control
Response & Control
Security
PASSENGER EXPERIENCE
Self Control
Less Queue & More
Communication
+ Improve Passenger Experience
Real Time Feedback & Analysis & Control
Energy
Facility Automation Management System (FAMS)
Water
Waste
Health
Sense & Comfort
FACILITY OPERATION
Improve Integration & Data sharing
Improve Health & Comfort
Reduce Resources
Reduce Manpower
Adapting
Improve Passenger Experience
Improve Revenue & Efficiency
Improve Security
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Airport
Collaborative
Decision Making
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Smart
Airport
Airport
Operation
Control Centre
(AOCC)
Working at One
+ Improve
Passenger
Experience
FLIGHT
CONTRO
L
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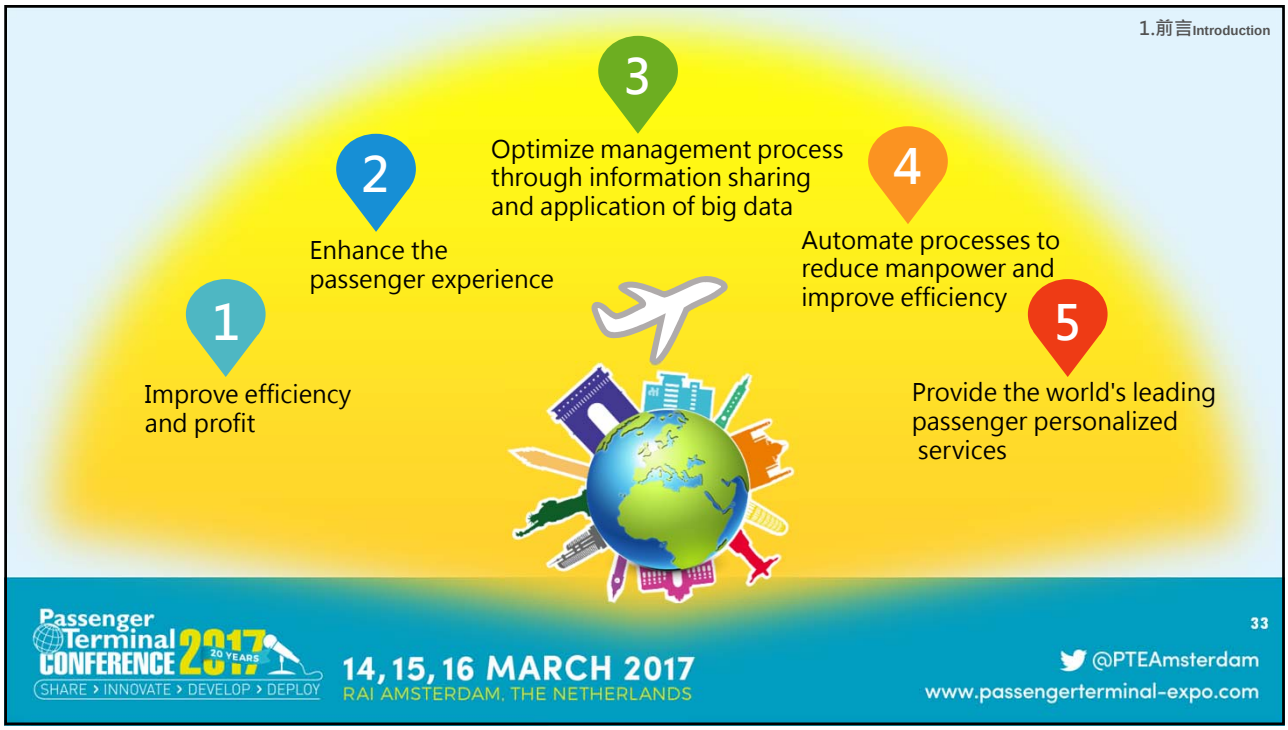
1.前言Introduction
3
Optimize management process
through information sharing
and application of big data
2
Enhance the
passenger experience
4
Automate processes to
reduce manpower and
improve efficiency
1
Improve efficiency
and profit
5
Provide the world's leading
passenger personalized
services
Passenger
Terminal
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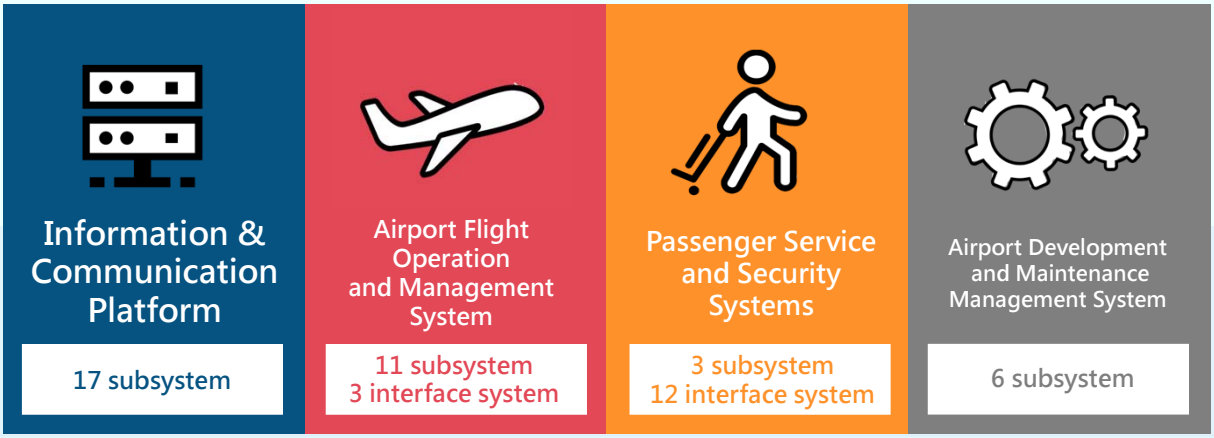
# T3 ICT System

- Information & Communication Platform
- Airport Flight Operation and Management System
- Passenger Service and Security Systems
- Airport Development and Maintenance Management System



# System component



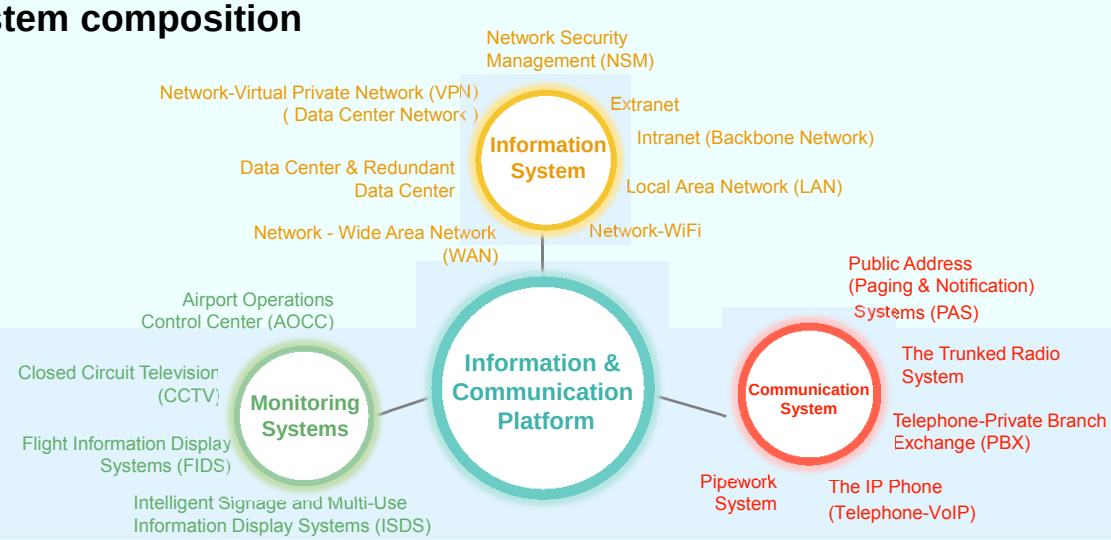
# Information & Communication Platform

- Design concept
- System composition
- System architecture
- System function





## System composition



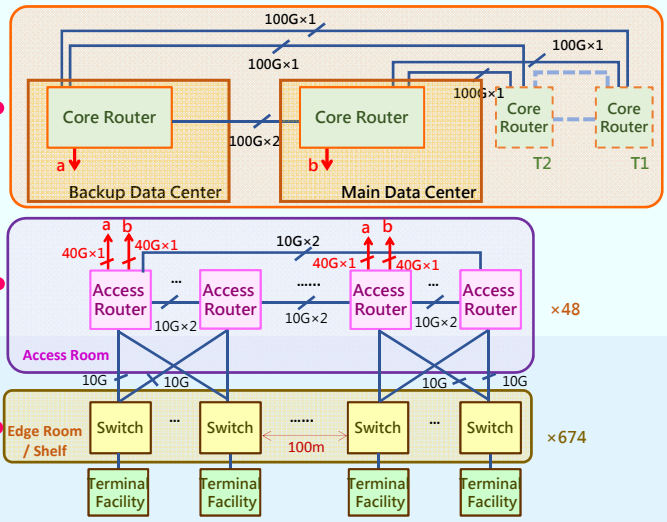
# System architecture



- Loop and Redundant architecture between T3 Core Router and existing T2/T1 Core router
- Estimate 2 Core Router

- Redundant architecture between Access router and Core Router
- Loop architecture between Access Routers
- Estimate 48 Access Routers

- Set Edge room/shelf **every 100m**
- Redundant architecture between Switch and Access Router
- Estimate 674 Access Switches










# Communication system function

## Wifi Service & Location

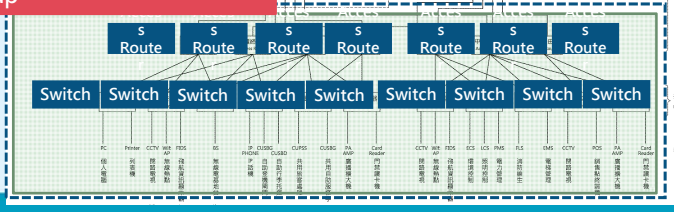
- Separate Airport staff and passenger services to avoid affecting the operation
- Provide location-based services, strengthen the personal APP service

## Open Backbone Network

- Different systems sharing platform does not interfere with each other
- Different paths complete backup

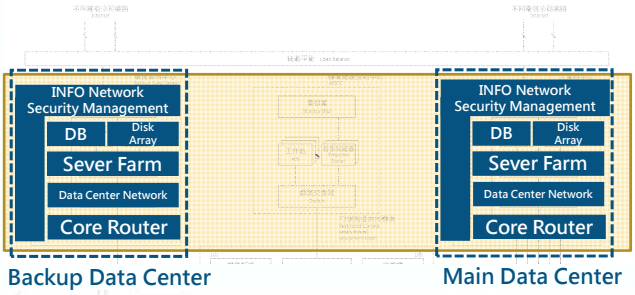
## Shared wireline telephone system

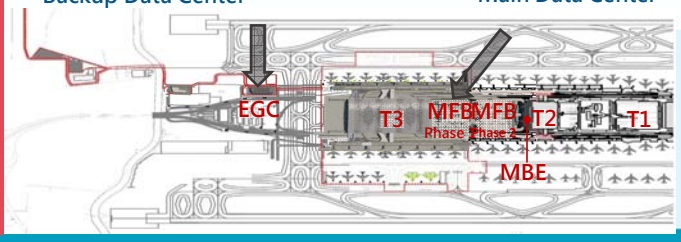
- Single switch, shared by the units



# Information system function

- Establish a master and backup architecture
- Cloud platform to provide information sharing platform for various units
- Use SDN to integrate the information security platform and ensure that individual systems independent and secure

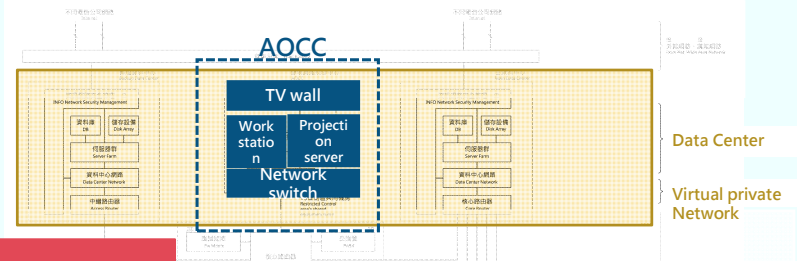





# AOCC System function

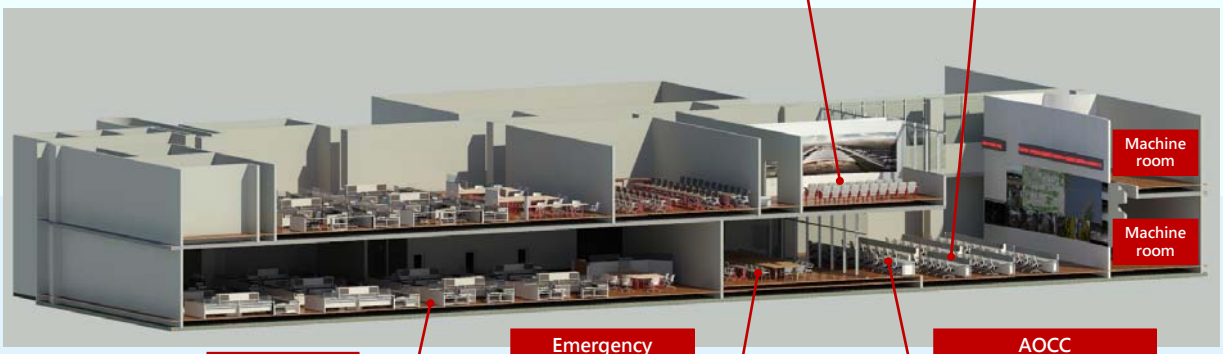





- Integration and monitoring the airport as a whole real-time information
- Real-time communication and response across the organization

# AOCC 3D view








# Information display function



| FIDS | ISDS | Kiosk |
|---|---|---|
| • Airport Operational Database(AODB)<br>• Emergency Response System(ERS)<br>• Advertising information | • AODB<br>• Public information with internet (traffic、weather、environment)<br>• Advertising information | • AODB<br>• Geographic Information System(GIS)<br>• Space & Lease Management System(SLMS) |

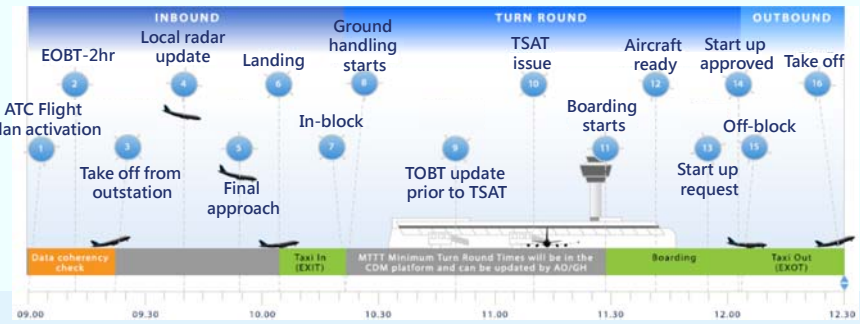
# Airport Flight Operation and Management System

- Design concept
- System composition
- System architecture
- System function



## Design concept (1/2)






- IATA, ICAO and Eurocontrol have put forward a set of airport management measures, which are called **airport coordination and decision-making platform(A-CDMP)**, in order to enable the airport to follow the flight real-time dynamic and the effective allocation of resources.
- ACDMP is designed to enable airport stakeholders to have access to real-time flight information by tracking 16 key milestones on flights, thereby scheduling the corresponding processing and services.

# Design concept(2/2)



T3 ICT designs as ACDM concept, and the development of a set of logic of departure and arrival scheduling algorithm.

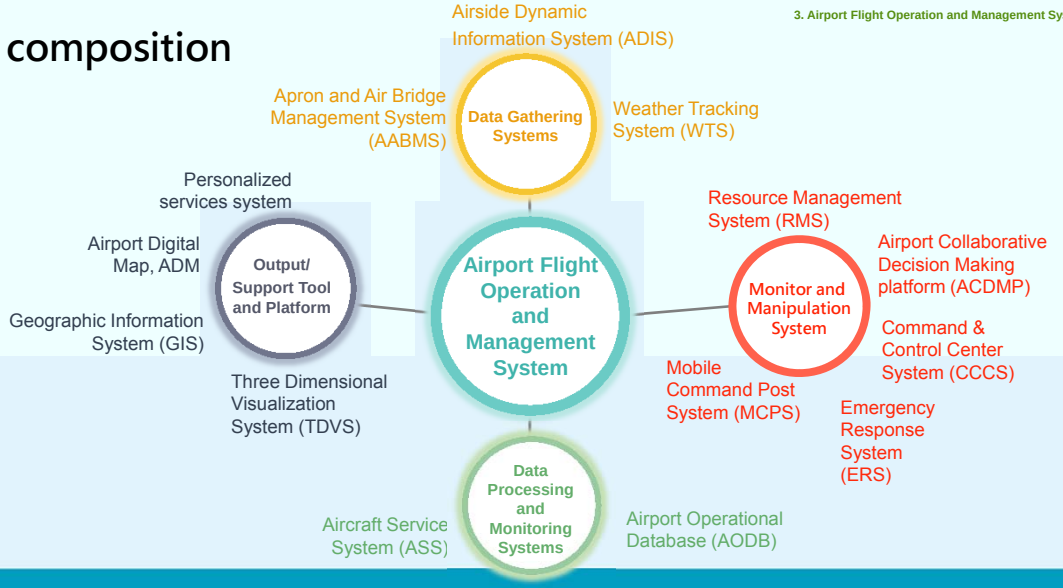
Departure schedule is readjusted by using flight timesheet and flight dynamic messages to optimize and provide sequence and time points of departure of various flights as reference for the tower control personnel and related units in the airport operation control center (AOCC).

- Target:
  Maximizing number of departure flights within a unit time.
- Control factors:
  Target Start Up Approval Time (TSAT) of various flights.
- Constraint factors:
  Runway capacity, Estimated Taxi-Out Time (EXIT), airline preference (priority), predetermined flight timesheet etc.




# System composition





# System function(1/5)



Near field flight display map

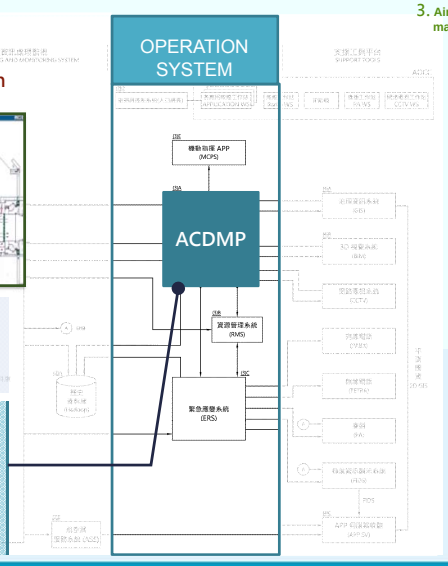
Airside operation status map

Landside operation status map

Display locations of various flights in airspace within 50 miles of the airport

Display locations of all aircrafts and vehicles

Display locations of abnormal equipment

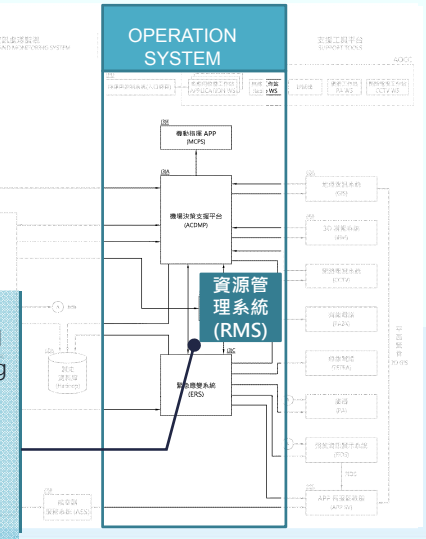



- All types of maps show all flight resources real-time status and combine with GIS
- Can click on the platform to access CCTV to grasp the emergency situation



# System function (2/5)

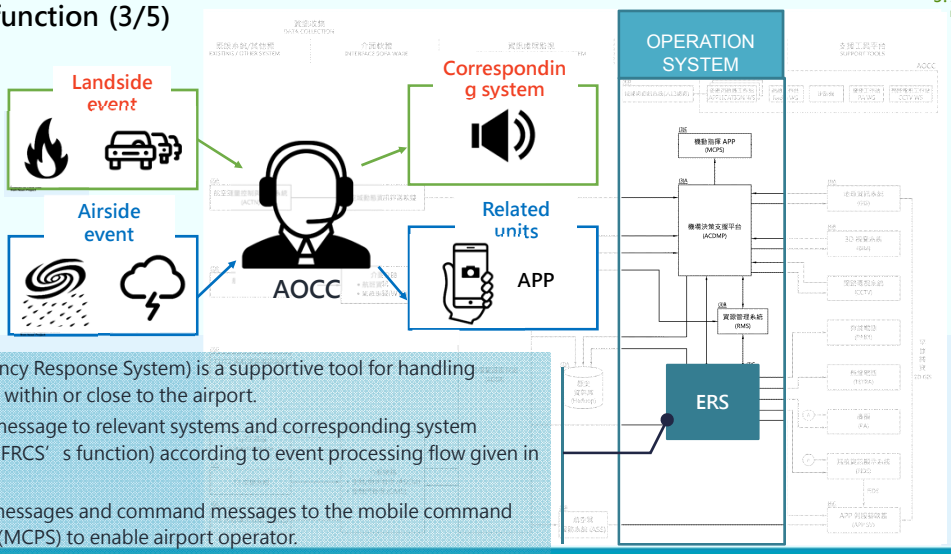





- Predict future resource usage.
- All allocation of flight related resources, including fixed resources (aprons, check-in counters) and maneuvering resources (ground crews ...).
- When the flight delays or changes, system can automatically or manually adjust the resources.
- The system immediately release schedule of the latest resources on FIDS board.

# System function (3/5)

3. Airport flight operation management system




- ERS (Emergency Response System) is a supportive tool for handling emergencies within or close to the airport.
- Send event message to relevant systems and corresponding system (incorporate FRCS' s function) according to event processing flow given in rule library.
- Push event messages and command messages to the mobile command post system (MCPS) to enable airport operator.



# System function(4/5)

3. Airport Flight Operation and Management System

Application of IOT

**Application layer**

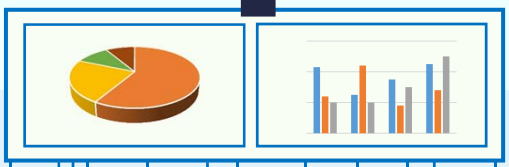
The equipment status display with 3D vision system for AOCC staffs

**Monitoring layer**

Monitor and control the energy use of airport equipments

**Sensing layer**

Sensing the status of each device through the detector

Environmental Control equipment
Personnel Control
Video surveillance
Machine room surveillance
Electric equipment
Fire equipment
Lighting device
FAMS
NMS
Security equipment
Water and drainage equipment
Elevator equipment

# System function(5/5)

**Passenger Resource Inquiry**

- Show all items of real-time service level and operational status, including: check-in counters, self-service facilities, carry-on baggage checking counters and passport inspection counters.

**Airside Resource Inquiry**

- The Gantt chart displays the latest schedules for all items of the query item, including: apron, air bridge and boarding gate.

**Facility Maintenance**

- User can manually create the fault notification.
- After the maintenance vendor logs in, the fault notification can be read.


**Flight Dynamic Inquiry**

- Shows the time of flights at each significant milestone.

**Event Message Push**

- Receiving messages sent by the Airport Operations Control Center (AOCC).

**GIS application**

- Check the various types of map services provided by Airport Coordination Decision-Making Platform (ACDMP).



# Passenger Service and Security Systems

- Design concept
- System composition
- System architecture
- System function



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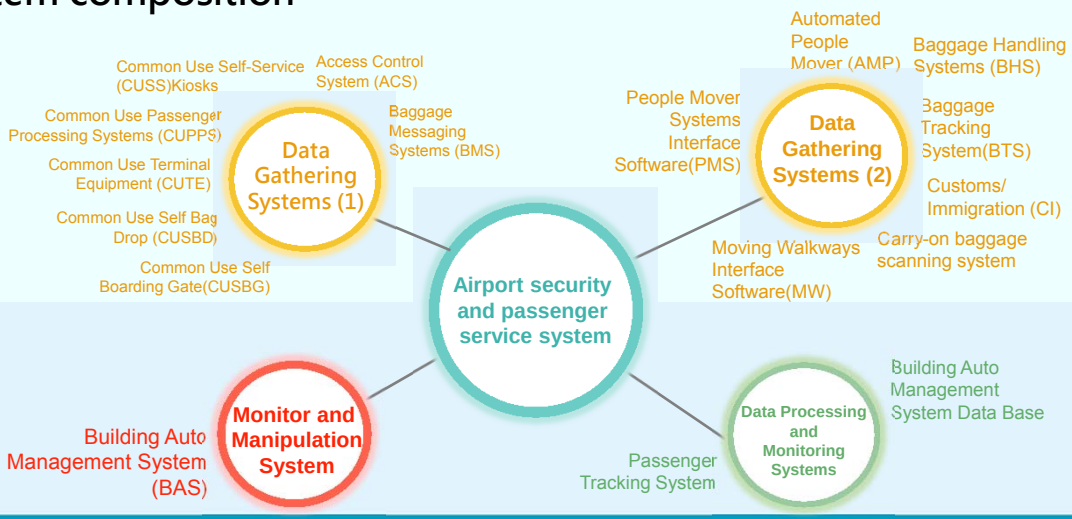
# Design concept

The airport security and passenger service system is designed with a personal, simple and comfortable passenger experience and reduces manpower input through system automation services to enhance service efficiency and enhance the overall passenger experience.






# System composition



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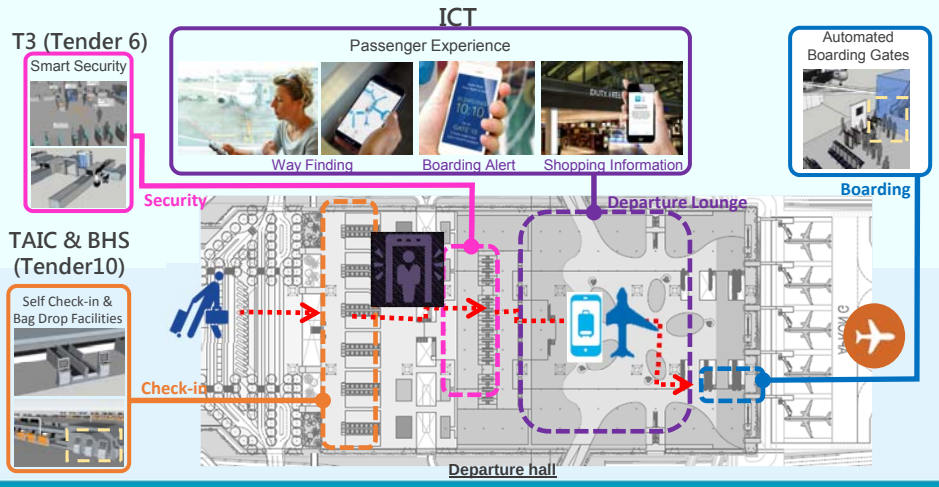
# System function(1/6)

4. Airport security and passenger service system

## Smart Airport Passenger Experience Summary -Departure

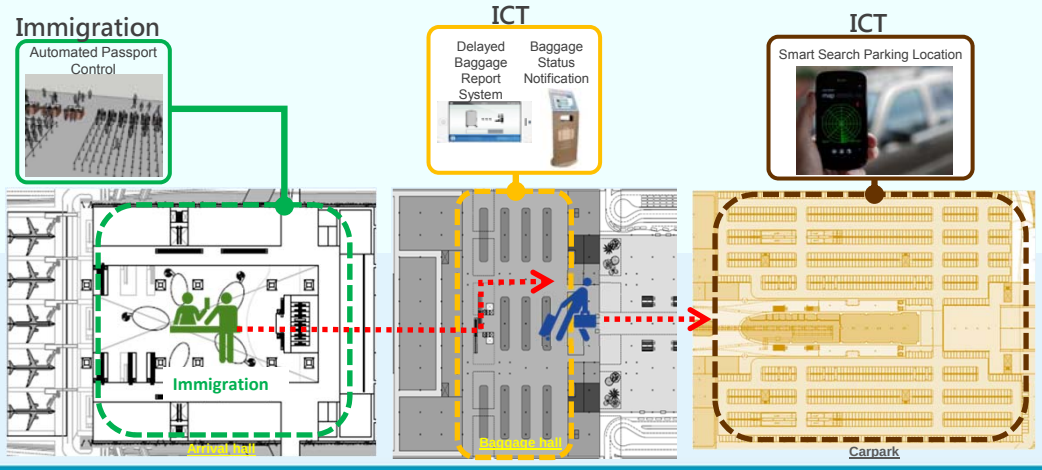





# System function(2/6)

4. Airport security and passenger service system

## Smart Airport Passenger Experience Summary -Arrival



3.Airport flight operation management system

# System function(3/6)

Passenger APP

## Log-in

- It supports login using Facebook, Google Tweeter, Weibo, WeChat

## Terminal information

- Indoor position: personal location
- Airport facilities : information desk, elevator, baggage check-in

## Fight information

- Search flight information
- Setting "My Flight" : manually, scanning QR Code or BarCode of boarding pass.
- Flight reminder: boarding time, gate number, change flight

## Push information

- Duty free info: dining, shopping and promotional information
- Push the emergency event



3.機場飛航營運管理系統 Airport flight operation management system

# System function(4/6)

Passenger APP

## Service status

- Wait time at security checkpoints, passport, passport control
- Baggage handling status

## Interface language

- Equipped with Traditional Chinese, Simplified Chinese, English and Japanese versions
- Traveling words and phrases in Traditional Chinese, Simplified Chinese, English, Japanese and Pinyin

## Traffic around the terminal

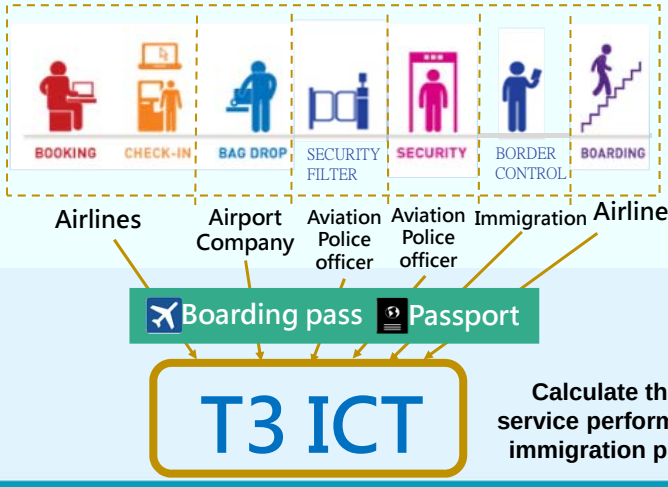
- Airport parking: location, fares
- Car rescue service information
- Terminal shuttle buses: location, frequency

## Access transportation

- Provide the information of buses, long-distance buses, metro and high speed rail to airport

# System function

## Passenger Tracking System(PTS)(5/6)



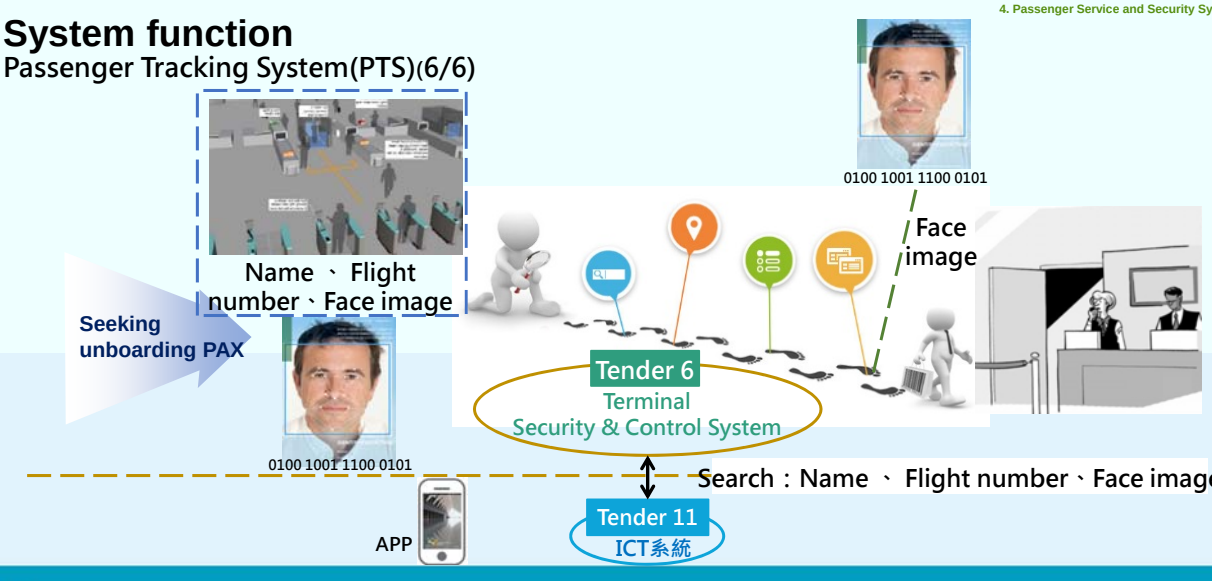

Calculate the real-time service performance of each immigration process point





# System function

## Passenger Tracking System(PTS)(6/6)



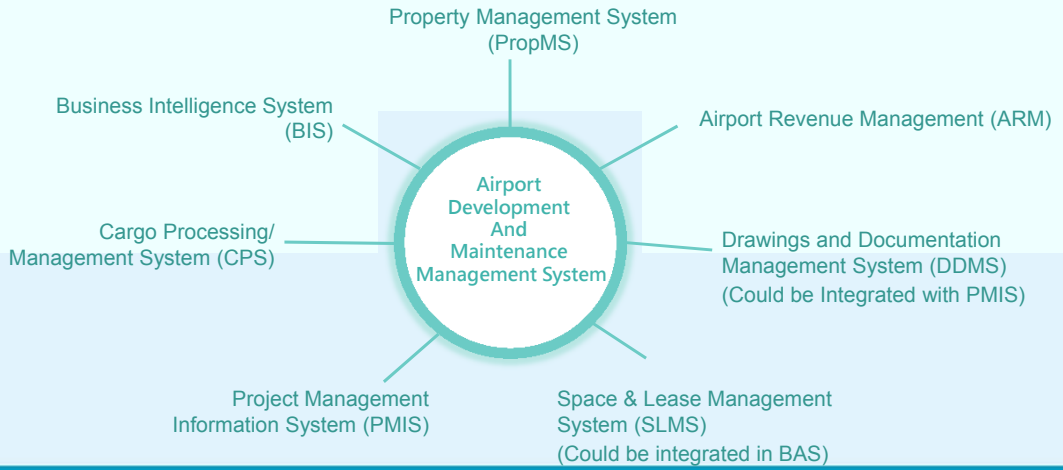
# Airport Development and Maintenance Management System

- Design concept
- System composition
- System architecture
- System function





## System composition

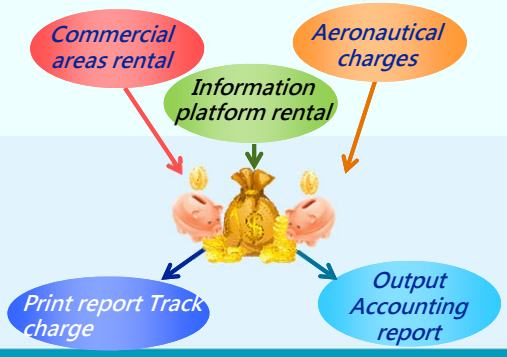


# System function (1/2)



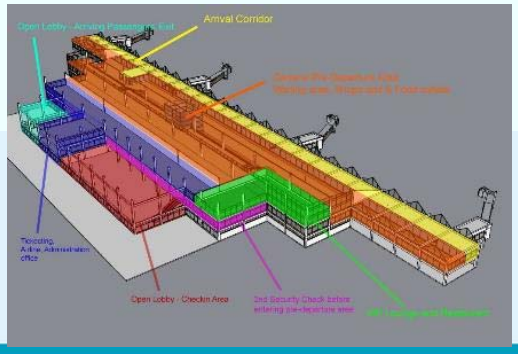
## Airport Revenue Management System

- Combine the charge function
- Charges automatically & print reports
- Transmit to big data analysis




## Space & Lease Management System

- Display leased item in 3D
- Electronic leasing statements
- Analyze performance contribution of each lessee






# System function (2/2)
(*Business Intelligence System*)




Use historical databases to collect airport commercial facilities, huge consumption, sales and management information

To extract valuable data from a big data analysis to assist business units with appropriate statistical models

Data Science

Big Data

Analytics

Report

assist analyzers operate the system with visualized and interactive analysis tools

Use graphical reports to describe operational conditions as a basis for decision-making for manager and to improve operations strategies and processes

# Integration with existing T1/T2



## Key Concepts of integration

- Purpose: Maintain the same level of service quality
- Behind the scene: IT technology evolve quickly
- Challenge: T1/T2 upgrading IT network/architecture
- How to integrate well with the future T3 IT network well?

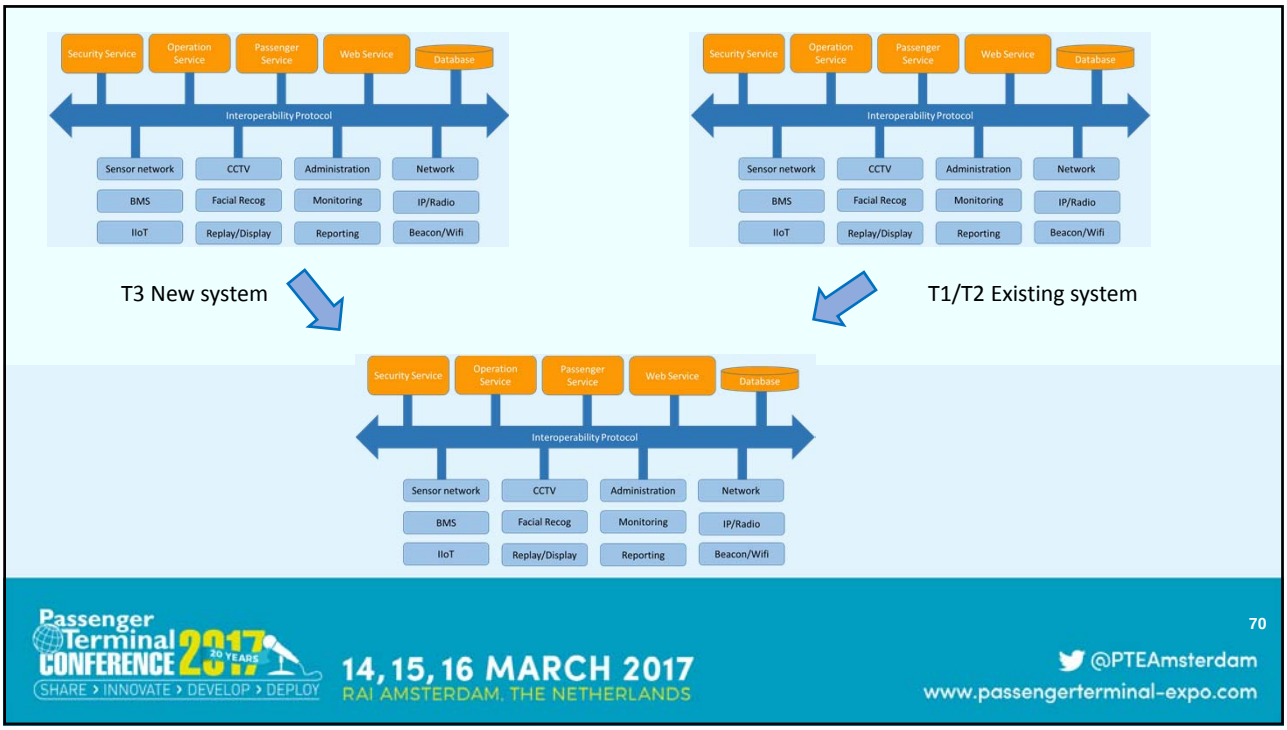
# Management system integration

- IT Network integration ***√***
- Wireless network integration ***√***
- ***AODB Integration ?***
- ***How?***



# Solutions

- Open Standard Data Bus to connect two terminals
- Use Information Broker(IB) or Data Distribution Service (DDS) technology to integrate new and existing systems


Security Service
Operation Service
Passenger Service
Web Service
Database
Interoperability Protocol
Sensor network
CCTV
Administration
Network
BMS
Facial Recog
Monitoring
IP/Radio
IIoT
Replay/Display
Reporting
Beacon/Wifi
T3 New system
T1/T2 Existing system
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OBJECTIVE
January 2021 opening
Max. Airport benefits
AOCC
Information communication platform
Intelligent service system
Information Sharing
Information Technology
Communication platform
source sharing platform
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# Conclusion



## 6.Conclusion

**Taiwan Taoyuan International Airport**
**2016 SKYTRAX awards list**

# Project Budget

The total construction fee will at about 2 billion

| Item | Particulars & Description | Total (US) |
|---|---|---|
| No.1 | Boundary Enclosure, Pipeline Relocation & Earth Works | 42..9M |
| No.2 | Architectural Works for Tourist Group Check-in on East Side (MBE) | 38.9M |
| No.3 | Apron, Taxiway Civil Works | 81.3M |
| No.4 | TB & MFB Foundation Works | 94.7M |
| No.5 | Multi-Function Building | 250.2M |
| No.6 | T3 Main Terminal Building | 881.4M |
| No.7 | Terminal Road Works | 49.5M |
| No.8 | Public Facilities (EGC, ESS, Sewage Pipe & WSP) | 213.7M |
| No.9 | Aeronautical Ground Light (AGL) | 4.1M |
| No.10 | Baggage Handling System (BHS) | 123.9M |
| No.11 | Information & Communication Technology (ICT) | 71.6M |
| No.12 | Passenger Boarding Bridge System (PBB) | 47.4M |
| No.13 | People Mover System (PMS) | 144.7M |
| | Summary | 2,044.3M |





# *Tender strategy*

| System / Item | ICT | BHS | PMS | PBB |
|---|---|---|---|---|
| RFI | Feb, 2017 | Mar, 2017 | Apr, 2017 | Apr, 2017 |
| RFP | Apr, 2017 | May, 2017 | Jun, 2017 | Jun, 2017 |
| Award | May, 2017 | Jul, 2017 | Aug, 2017 | Aug, 2017 |
| Design and Construction | Jun, 2017 | Aug, 2017 | Sep, 2017 | Sep, 2017 |


THANKS FOR YOUR LISTENING
謝謝

# The management of taxis in Taiwan Taoyuan International Airport(Present V.S Future)

**Mercy Fong**
**Clerk**
**Taoyuan International Airport Corporation Ltd**



## Outline

1. Taiwan Taoyuan International Airport(TTIA).
2. Taxis in TTIA.
3. The management of taxis in TTIA(present).
   - ① What's the Self-Regulatory Organization?
   - ② The difficulties and limitations
4. Improvement and enhancement
5. The management of taxis in TTIA(Future)
6. The expected benefits

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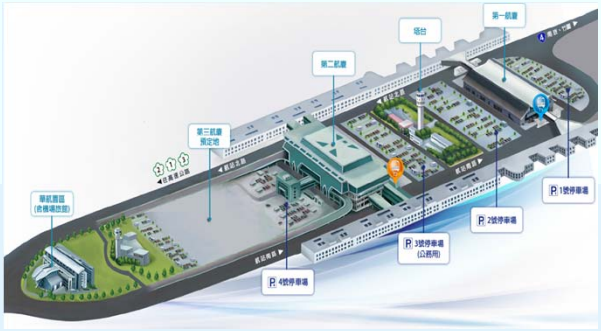
# 1.Taiwan Taoyuan International Airport(TTIA)

✓Taiwan Taoyuan International airport(TTIA)
- Location: Taoyuan City Taiwan.
- Type: International airport.
- Terminal:T1&T2；T3(2021).
  - Terminal I Opened: February 26, 1979
  - Terminal II Opened: July 29, 2000
- Passenger volume: increase year after year.



✓Transportations in TTIA:
- Bus
- Taxi
- Sky train
- Taoyuan International Airport MRT



# 2.Taxis in TTIA

✓Operating regulations:
- Drivers must have a Registration Certificate
- Vehicle is in a good condition
- Fully equipped
- Clean and tidy
- Emissions in the 1900 State CC above.

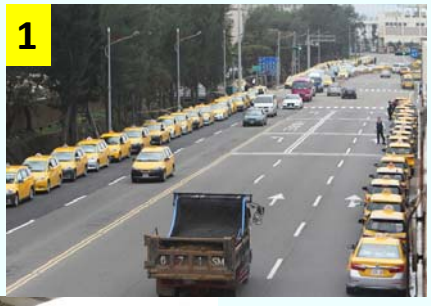
✓Service:
- Operation hours:24 hours a day, year round
- Fare standards: based on the meter
- Wheelchair-accessible Taxi

## 2.Taxis in TTIA

✓Taxi amount: depends on the operation of TTIA.
- 684 cars(2016).

✓All the Taxi drivers in TTIA:
- By drawing lots.
- three-year a round.
- Uniforms.

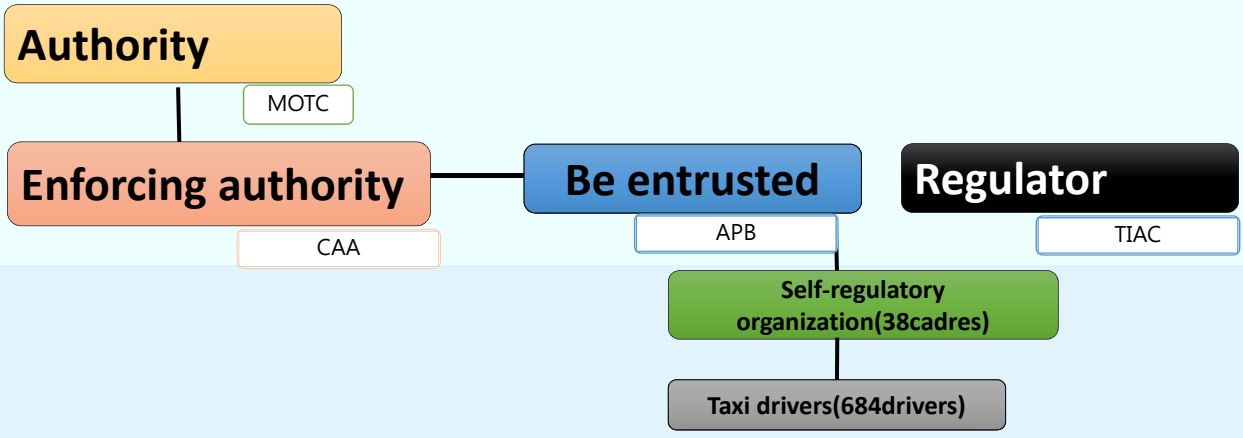
✓Vehicle requirements:
- Within four-year new vehicle.
- Emissions in the 1900 State CC above.
- Unique logo







## 3.The management of taxis in TTIA(Present)

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# What’ s the Self-Regulatory Organization?

✓Self-regulatory organization:

- consists of taxi drivers in TTIA.
  - Managers/cadre : Recommended from the self-regulatory organization.
- Rights and responsibilities:
  - vehicle allot、complain response、management、punishment…etc.

✓Advantages:

- Familiar with  the mode of operation
- Easy to communicate with drivers



# What’ s the Self-Regulatory Organization?

✓Disadvantages:

- Unjustness
- Financial problems
- Shortage:
  - ☐Language ability
  - ☐Professional competence
  - ☐Managerial capacity
  - ☐Standardization
  - ☐Innovation
  - ☐Activity

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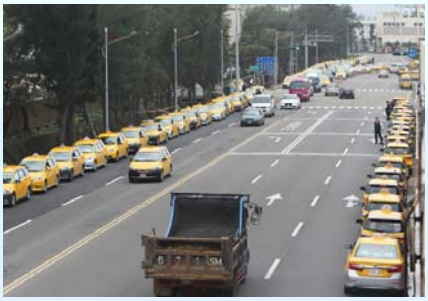
# 3.The difficulties and limitations

- ✓The incomplete rules:
  - Some members could be retained in the next period.
    - ☐Repeated list(cadres)
  - The low probability of drawing for TTIA's taxi drivers.
- ✓Money-Oriented
  - Lack of enthusiasm and innovation
  - Not blending passenger's needs into airport operation.



# 3.The difficulties and limitations

✓Punishment :

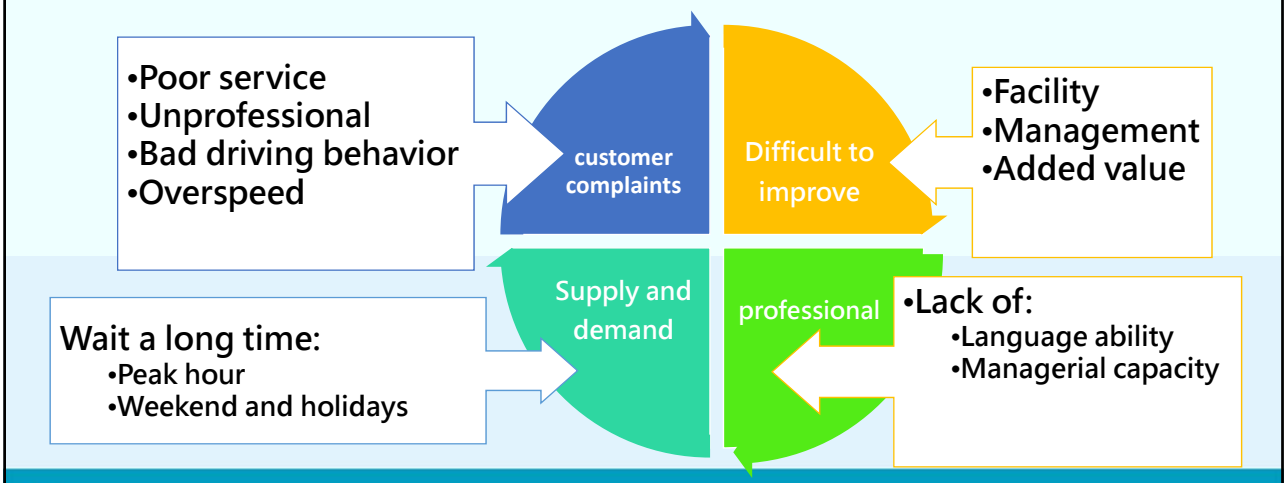
- Depends on the relationship between the cadre and drivers
  - Some drivers are dissatisfied with the management
  - Lack of the centripetal force


✓Customer complaints:

- Long time waiting in peak hour
- Full of unauthorized taxis in the TTIA
- Poor service



# 3.The difficulties and limitations



## 4.Improvement and enhancement

✓Revise the regulation(2016/7~2017/01):

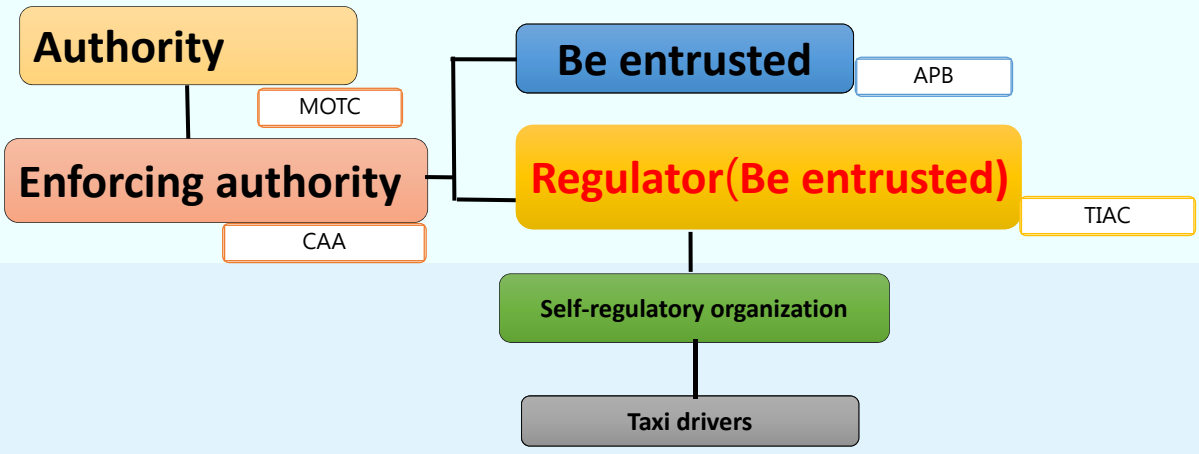
- By meeting and communicating with taxi labor unions and related groups

✓Enhance competitiveness:

- Training
- Education
- Service improvement



## 5.The management of taxis in TTIA(Future)

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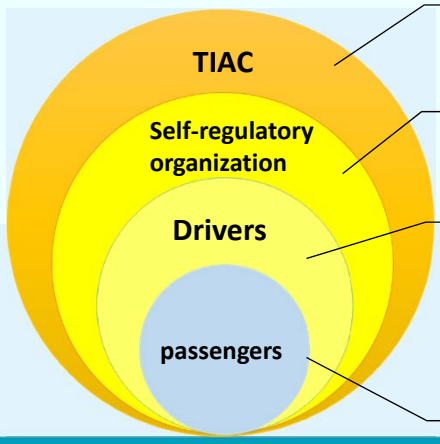
## 6.The expected benefits




- Operator
- Enhance competitiveness
- Service enhance

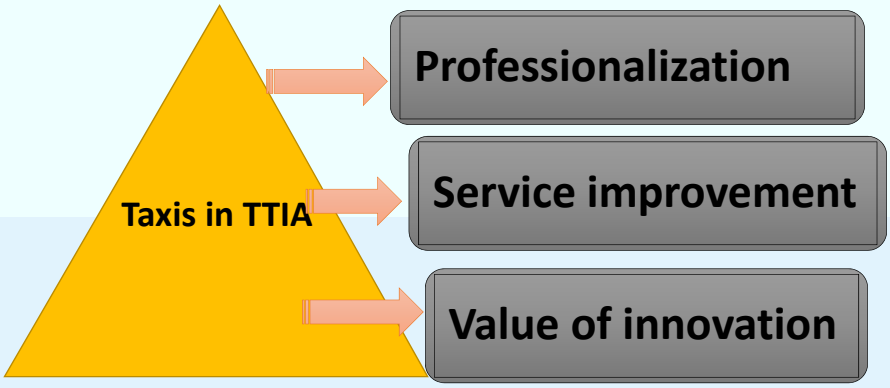
- Communicate with drivers

Enhance competitiveness

- Professional service
- Diversified payment method
- Innovative services



## 6.The expected benefits



# Thank you

# Rou-You Lin
# Yin-Tung Wang

Staff ,Business Department
Taoyuan International Airport Corporation




# Exhibits of cultural and artistic cooperation at Taoyuan International Airport

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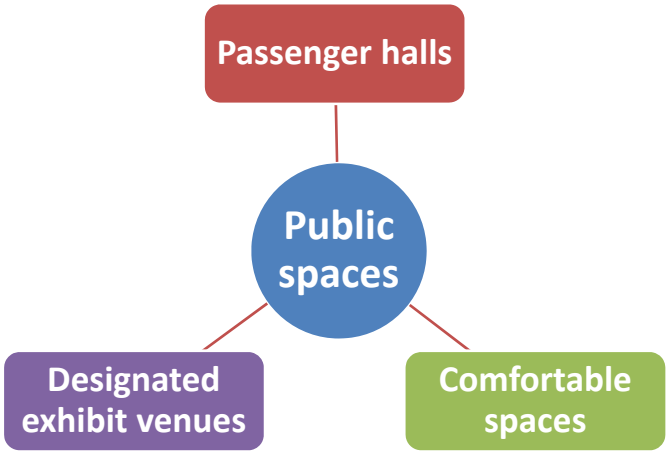
# Outline

- Selection of exhibition spaces in TTIA
- Exhibit areas
- How do we manage?
- Exhibition calendar arrangements
- Exhibition Topics
- Cooperation
- Restrictions of exhibition
- Advantages of cooperation

# Selection of exhibition spaces in TTIA

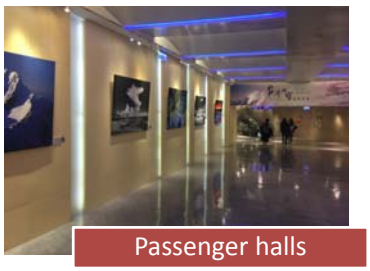


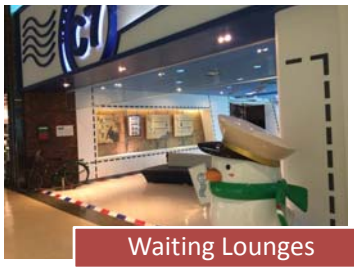
# Exhibit areas


Showcases


Baggage carousels


Art galleries


Passenger halls

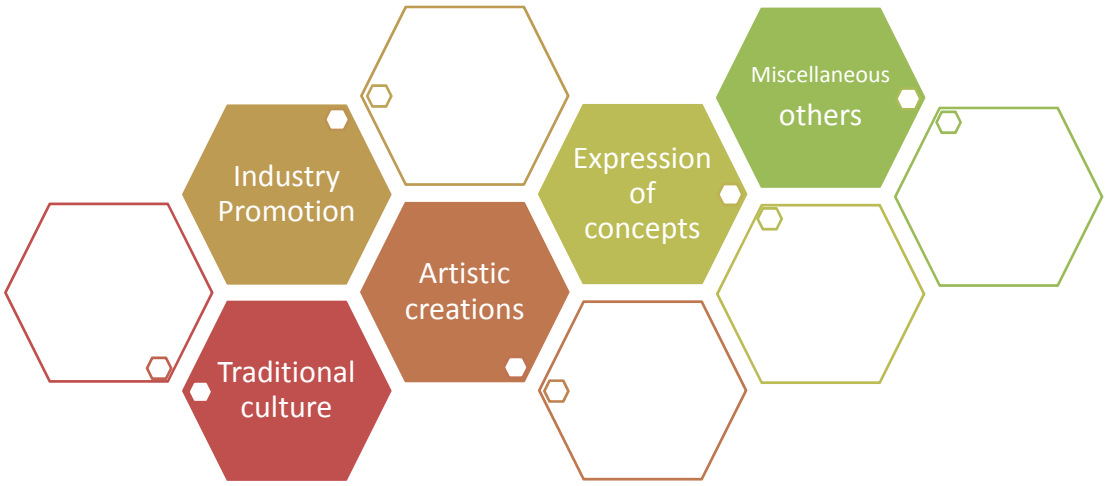

Waiting Lounges

# How do we manage?

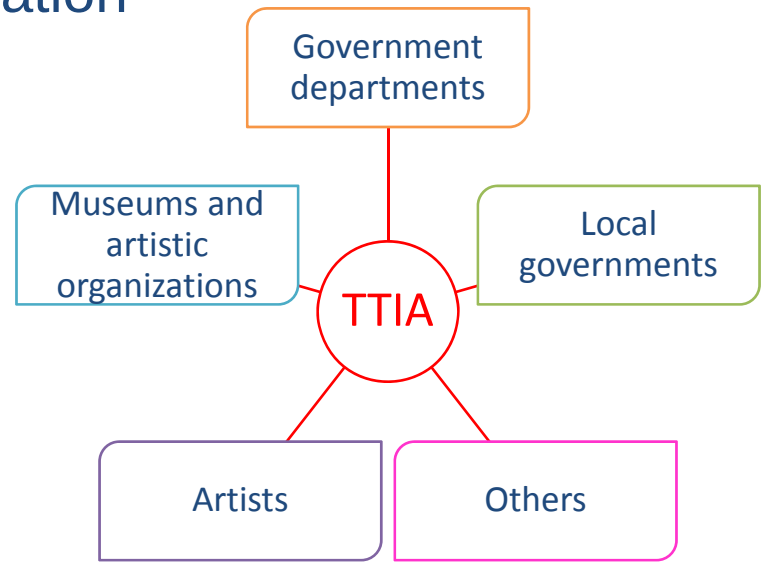
| Managed by TTIA | Managed by Duty-free shops(DFS's) |
|---|---|
| • Sponsorship role<br>• Organizer self-funded<br>• Public sectors as main cooperators<br>• Application filed by organizer | • Contract bounded<br>  • TTIA x DFS's<br>  • DFS's x Exhibition<br>• DFS's funded |

# Exhibition calendar arrangements


# Exhibition Topics



## Cooperation




## Government departments

- Accommodate government policies
- Promote local cultures and native characteristics of Taiwan

## Ministry of Economic Affairs
## Work with Taiwan External Trade Development Council

- **Taiwan Excellence**



Photo By Ever Rich Duty Free Shop

## Ministry of Education
## work with National Taiwan Arts Education Center

- **National Student's Art Competition and Exhibition**



Photo By National Taiwan Arts Education Center

Small and Medium Enterprise Administration of Ministry of Economic Affairs worked with Miaoli Sanyi Wood Sculpture Association

## Wood Sculptures and Vintage Tableware Displayed in TTIA


Photo By Taiwan Taoyuan International Airport e-Newsletter

Hakka Affairs Council

## Stay with Hakka-Exhibition on the Hakka Life Aesthetics in Taiwan


Photo By Tasa Meng Duty Free Shop

## Local governments

- Encourage “in-depth traveling” to relevant cities
- Promote international exhibitions hosted

## Taipei City Government

### Design Capital and Airport Design

WORLD DESIGN CAPITAL TAIPEI 2016


Photo By Department of Cultural Affairs, Taipei City Government

Taoyuan City Government

## Tung Blossom Land Art in TTIA

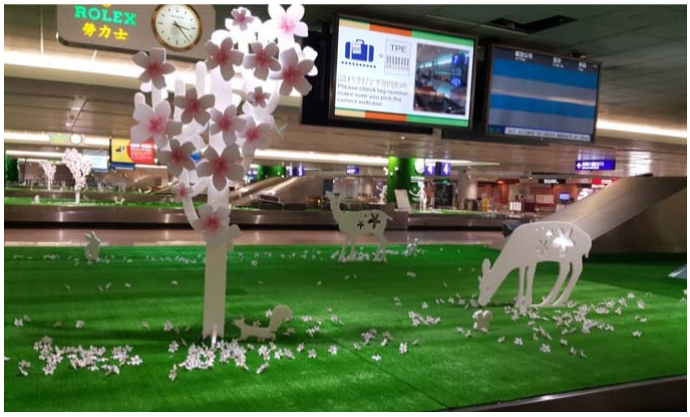



Photo By Department of Hakka Affairs Taoyuan

## Museums and artistic organizations

- Display of collections and introduction to history of culture.

## National Museum of Taiwan Literature

- **Window on Taiwan Literature**

## Children's Art Museum in Taipei

- **An Exhibition from the Children's Art Museum in Taipei**

# Artists

- Artistic creations by local artists





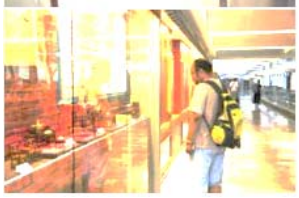



Photo By Taiwan Taoyuan International Airport e-Newsletter

## Shi-chi Chen

- ***Spoon! Meaning*** **-Shi-chi Chen Metal Creations Exhibition**


Photo By Taiwan Taoyuan International Airport e-Newsletter

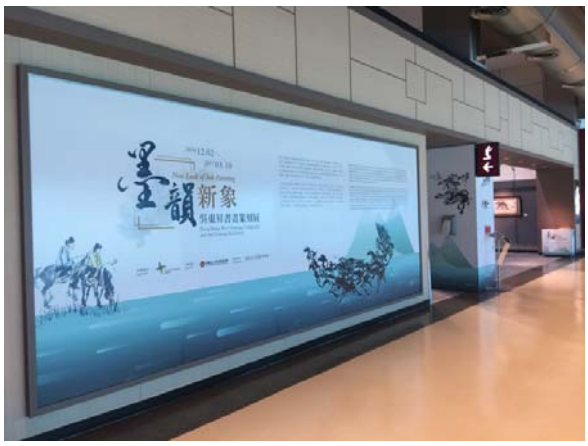
## Jui-Feng Hsu

- **Fragrance and Beauty: Porcelain Art Exhibition of Jui-Feng Hsu**

Photo By Ever Rich Duty Free Shop

## Dong-Sheng Wu

- **Dong-Sheng Wu's Painting Calligraphy and Seal Cutting Exhibition**



## Johnfish Gallery

- **Taiwan Bird Photography Exhibition**

## Others

- Expression of concepts

## Ever Rich Duty Free Shop

- **LOVE LAND – Returning to the Basics EVERRICH ART FESTIVAL**

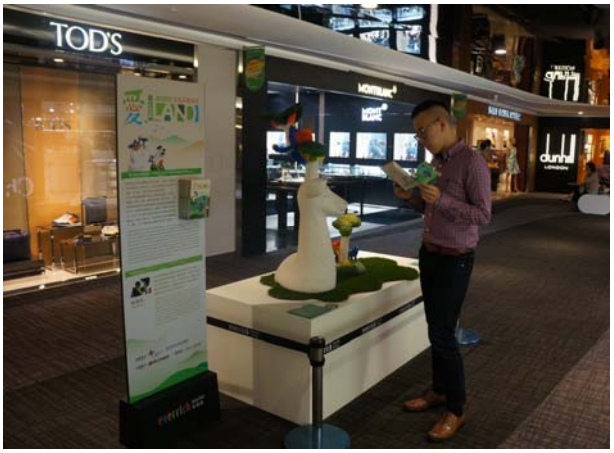



Photo By Ever Rich Duty Free Shop

## Restrictions of exhibition

- Limited resources from cooperators
- Sensitive issues
- Aviation security regulations

## Advantages of cooperation

- Great variety of topics
- Promote mutual benefit
- Effective use of funds and spaces