出國報告（出國類別：其他）

「出席國際航空無線電協會（RTCA）2012 年年會」出國報告

服務機關：交通部民用航空局

姓名職稱：李世平　專員

出國期間：民國 101 年 6 月 3 日~民國 101 年 6 月 9 日

報告日期：民國 101 年 8 月 17 日

目　錄

壹、目的

一、 RTCA 簡介

國際航空無線電委員會（Radio Technical Commission for Aeronautics, RTCA）是專門由美國民間非營利性股份公司（RTCA Inc.）運作的國際著名組織。主要針對航空領域內的通信、導航、監視和空中交通管理（CNS/ATM）系統問題，提出一致性的建議。

RTCA 主要履行聯邦諮詢委員會的職責，由 RTCA 提出的建議被美國聯邦航空總署（FAA）用作制定政策、專案和管理決定的依據，也被一些私人公司用作制定發展、投資和其他商業決定的依據。

RTCA 自 1935 年成立以來，陸續已經有近 400 個來自美國和世界，包括我國民用航空局在內的政府機構、企業和學術組織申請爲 RTCA 組織的會員。這些會員幾乎涵蓋了整個航空領域。RTCA 有效地與政府和企業進行合作，針對航空使用者的實際需求，對航空系統和技術的運作使用提出規範建議。RTCA 的功能類似於聯邦諮詢委員會，對於通信、導航、監視、及飛航管理系統(CNS/ATM)提出一致性的基礎建議，其建議經

常被 FAA 作爲政策、計畫及管理決定的基礎，亦被私人企業作爲未來公司發展、投資及其他商業決策的基礎。

舉例來說，NextGen 專案小組並不會提出有關技術標準及需求的建議，有關提出技術標準及需求的工作係由 RTCA 其他相關如 ADS-B、TCAS、Data Comm 專案小組提出，NextGen 專案小組不發展技術準則，但將同步了解其他專案小組所提出的工作進度及成果。

實務上，所有 RTCA 的成果都是由相應專業志願人員組成的特別委員會（Special Committees）研究出來的。 RTCA 以特別委員會會議方式，向公眾發佈將要研究的問題，同時接受任何有興趣的專業志願人員參與該問題的特別委員會的具體工作。在 RTCA 研究各類問題過程中，一貫堅持取得一致性意見爲其宗旨。

具體地研討細節，由 RTCA 政策研究委員會授權給特別工作組（Task Force），對廣泛的標準政策問題制定出一致性的建議。由 RTCA 的專案管理委員會（Program Management Committee）組織專業委員會（Special Commission），爲航空電子系統制訂最低作業性能標準（Minimum Operation Performance Standards, MOPS），或相應的技術指導文件。

鑒於 RTCA 在航空領域內作出的貢獻，RTCA 曾在 1949 年榮獲 Collier Trophy 獎，在 1994 國際民航組織（ICAO）成立 50 周年之際，RTCA 榮獲 ICAO 50 周年榮譽獎。

二、 會議目的

2012 年 RTCA 年會假華盛頓特區之華盛頓會議展覽中心（Walter E. Washington Convention Center）舉行，本年度的會議主題爲「向 NextGen 的目標邁進」（Advancing the Goals of NextGen），著眼於如何開始建置美國聯邦航空署之次世代飛航運輸系統（Next Generation Air Transportation System, NextGen）相關目標討論，會中除邀請美國聯邦航空署相關主管及航空業者與會研商外，另邀請歐盟飛航管理組織(EuroCONTROL)就歐盟地區「單一歐洲天空飛航管理研究計畫」（Single European Sky ATM Research, SESAR）進行經驗分享。

本局指派飛航管制組專員李世平出席，希望藉由實際參與會議之經驗了解美國目前 NextGen 計畫推行進度及未來發展方向。

貳、會議過程

一、　行程紀要

101 年 6 月 3 日～4 日

於桃園國際機場搭乘長榮航空 BR028 班機至美國舊金山國際機場轉機搭乘聯合航空 UA1743 班機至華盛頓杜勒斯國際機場

101 年 6 月 5 日～6 日

參加 RTCA 年會（華盛頓會議展覽中心）

101 年 6 月 7 日

整理會議資料

101 年 6 月 8 日～9 日

於美國華盛頓杜勒斯國際機場搭乘聯合航空 UA647 班機至舊金山國際機場轉機搭乘長榮航空 BR017 班機返國

二、會議議程及議題

RTCA 年度研討會：

產業重點從規劃轉移到執行

儘管在實現 NextGen 利益的方式仍存在若干挑戰，出席 2012 年 RTCA 年度研討會的航空界先進們都同意，最大的障礙不是技術性的，而是 NextGen 需要執行新的政策和程序。

開幕主題演講

6 月 5 日研討會開幕式，美國聯邦航空總署代理署長麥克‧赫爾塔（Michael Huerta）到場發表演講，並強調 “..... NextGen 的成功端賴如何有效地將政府和業界及所有的航空利益相關者連結整合在一起 “。赫爾塔代理署長強調美國聯邦航空總署如何從 RTCA 的 NextGen 諮詢委員會（NextGen Advisory Committee, NAC）獲得許多傑出建議，並與 NAC 合作，規劃和執行 NextGen。

在赫爾塔代署長之後演講的 NAC 主席，JetBlue 航空公司執行長戴夫・巴傑爾（Dave Barger），則是對 NAC 成員表達感謝，並強調失敗根本就不是 NCA 的選項。巴傑爾概述 NAC 的目標：邁向卓越、承諾以互助團結克服短視，邁向美好未來，而完成新政策的先決條件是成功的 NextGen 規劃和破除成功障礙的決心。

✧ 論壇議程 1 : NextGen Success – NextGen Advisory Committee perspectives on ensuring a successful NextGen implementation

論壇主持人:

Dave Barger , JetBlue Airways

論壇成員:

Sue Baer , PANYNJ

Ed Bolen , NBAA

Vicki Cox , FAA

Patrick Ky , SESAR

Paul Rinaldi , NATCA

於 2010 年 9 月應美國聯邦航空總署要求而成立，巴傑爾率領的 NAC 成員小組截至目前，已經舉行了六次會議，透過審查提出能力最佳、最好的服務政策，指標，非技術障礙的 NextGen 建置建議，並預爲檢視實施

NextGen，航空業所面臨的其他問題後，批准了十幾個已陳送到 FAA 的建議，包括 NextGen 建置指標、FAA 能力投資的優先次序、財務及營運裝備獎勵，商業案例分析、軌跡業務、數據通信期程規劃，地區空域改進及最佳化等議題。全國商務客機協會（National Business Aviation Association, NBAA）執行長愛德‧波恩（Ed Bolen）強調，NextGen 的內涵不只是科技，還包括政策和程序。SESAR 聯合執行長 Partick Ky 說，最有能力的飛機能獲得更好服務的關鍵是資訊公開。美國國家航管協會（NATCA）理事長保羅‧里納爾迪（Paul Rinaldi）提醒在座成員，各航機所具備的不同裝備能力，將成爲飛航管制員在管理航機時的挑戰。

✧ 論壇議程 2：Investing in NextGen – What does it take for industry and government to make investments?

論壇主持人:

Bob Hazel, Oliver Wyman

論壇成員:

Michael Dyment, NEXA Capital Partners

Fred Messina, BAH

Julie Oettinger, FAA

現場的電子民調顯示，大部分與會者認爲，在 NextGen 開始建置之初，需要有一些財務激勵配套措施，但要由政府提供足夠的更新機載設備資金是不太可能的。奧緯管理顧問公司（Oliver Wyman）的鮑勃・黑茲爾帶領論壇成員，討論公共和私營部門夥伴關係的需求，以及提供 NextGen 裝備的私人融資。FAA 的朱莉・歐廷格，描述了他們如何設法來解決這個問題，並回應相關主題。

✧ 論壇議程 3: Performance-Based Navigation – What is the roadmap to successful RNP implementation?

論壇主持人:

Michael Lewis, Jeppesen

論壇成員:

Jim Bowman, FedEx

Dave Newton, Southwest Airlines

Lynn Ray, FAA

Rob Eagles, IATA

在檢視如何讓 RNP 達到最大能力後，論壇成員一致同意直至 2018 年，有關性能導航及國家空域系統，將始終需要調整適應混合的各種機載裝備能力。爲了鼓勵航空器裝備提昇，必須發展 NextGen 作業的獎勵措施。在適

當情況下，「能者先得」（擁有最好的機載設備能力者，可獲最佳之飛航服務）的政策，必須取代行之有年的「先到先得」飛航服務政策。

主題演講：擁有一個成功的夥伴關係

也許本次研討會的最大共識是，FAA 應以阿拉斯加航空公司在西雅圖成功的「綠色天空」倡議爲基礎，建構並證明其有能力在美國的高密度都會區空域（Metroplexes）推出類似的解決方案。正如阿拉斯加航空集團主席比爾・艾爾（Bill Ayer）在主題演講中所述，“提高安全性、提供更好的客戶體驗、簡化員工的的工作和提高盈利能力，是最好的投資。”此方案的成功端賴團隊精神和一開始就將所有相關者納入參與。“在我看來，我們在西雅圖完成的和其他將進行的方案，所得到的最重要教訓，就是協力合作。”

✧ 論壇議程 4A: Security – What is the impact on NextGen?

論壇主持人：

T.J. Schulz, ACC

論壇成員：

Chris Bidwell, ACI

Fred Eissler, ALPA

David S. Velasquez, SAIC

Maryann King, Raytheon Network Centric Systems

保安 - 由機場顧問委員會（ACC）的 T.J.舒爾茨主持，開場提示有關之概念，主要是文化的改變，從“安全”（Safety）轉變爲“保安”（Security）（實體和網路保安），且保安已成爲 NextGen 規劃和實施過程的重要組成部分。一些主要障礙則在於政府各高階單位缺乏此觀念及飛航管理系統的特殊限制，從而需要轉換到一個跨領域企業制度來強化保安作爲。

✧ 論壇議程 4B：Unmanned Aircraft Systems – How do they fit into NextGen?

論壇主持人：

Rose Mooney, Archangel Aero, LLC

John Walker, Walker Group

Co-chairs RTCA SC-203, UAS

論壇成員：

Sean Cassidy, ALPA

Paul McDuffee, Insitu

Juan Narvid, DoD

Heidi Williams, AOPA

Jim Williams, FAA

由大天使航空公司（Archangel Aero）及 RTCA SC-203 小組（無人飛機系統）召集人羅斯‧穆尼（Rose Mooney）主持，與會者在論壇一開始便提出短期內無人飛機系統的操作將不會整合到 NAS 中的議題。於是開始討論如何把這些操作導入到航空系統。論壇成員同意，更進一步了解無人飛機的培訓和經營概況是發展整合策略的關鍵。論壇中提出了許多尖銳的問題，許多是聚焦在目前的航空操作需求（尤其是普通航空業）未受到無人機飛行架次的不利影響。

✧ 論壇議程 5： Best Equipped, Best Served/Best Capable, Best Served – How will operational incentives expedite NextGen?

討論推動 NextGen 所必須執行的獎勵作業之重要原則

論壇主持人：

Tom Hendricks, A4A

論壇成員：

Steve Brown, NBAA

Rick Ducharme, FAA

Jack Kies, Metron Aviation

Ed Lohr, Delta Air Lines

Lillian Ryals, MITRE

最佳能力，最佳服務 - 由美國航空運輸協會（A4A）的湯姆・亨德里克斯（Tom Hendricks）主持，在對話中強調「最佳能力，最佳服務」不僅僅是具備特定航空器設備，尚包括在 NAS 系統中作業的整套飛機能力。要成爲一個有效的政策，「最佳能力，最佳服務」還必須在整體系統的利益與個人利益間取得平衡。與會者一致認爲，最重要的是要找出“雙贏”的情景，使每個人的利益，甚至那些裝備不齊全的航空器，都能順利運作。因此，發展適切的政策和程序相對地重要，以善加利用科技的優勢，並使物有所值。重點是仍應將各特定功能，予以整合來實現潛在的更大利益。

✧ 論壇議程 6：ADS-B – The path forward

於此過渡期適時地檢視此監視技術，並討論航空界如何最大限度地運用此新功能。

論壇主持人：

Steve Brown, NBAA

論壇成員：

Vinny Capezzuto, FAA

Jens Hennig, GAMA

Debby Kirkman, MITRE

Rocky Stone, United Airlines

Rich Swayze, Senate Commerce Committee

第二天討論的焦點轉向 NextGen 的基礎技術－ADS-B。美國正進行全國 794 座 ADS-B（廣播式自動回報監視系統）站臺之建置，並爲接引 ADS-B 訊號，正進行航管系統之升級，此外預計在 2020 年達成美國營運者在所有飛機上安裝 ADS-B Out 的目標；由全國商務客機協會的史蒂夫・布朗（Steve Brown）主持的論壇，探討這個轉換的潛力和挑戰。發言者一致認爲 ADS-B Out，可以大大提高飛航安全性，而 ADS-B In 在導入產生應用獲利前，將會爲裝備的飛機帶來巨大設置成本。一些政府補助經費已開始投入，配合 FAA 示範裝備於某些飛機上，它可以提供相當的營運效益誘因，以使此基礎方案持續運作。雖然美國國會支持 NextGen，但參議院商務委員會幕僚瑞奇・斯威茲（Rich Swayze）警告說，國會是不可能爲營運者升級裝備提供大量的經費援助。

✧ 論壇議程 7：DataComm – The path forward

論壇主持人：

Steve Dickson, Delta Air Lines

論壇成員：

Chris Benich, Honeywell

Joe Burns, United Airlines

Diane DeSua, Lockheed Martin

James Eck, FAA

Todd Donovan, Thales

達美航空公司的史蒂夫・迪克森（Steve Dickson）引領本論壇專家成員，透過對數據通信的討論，強調引入 NAS 的數據通信能力的最佳方法上缺乏共識。迪克森總結了操作者導向的 NAC 數據通信工作小組主張在 2018 年以循序漸進的方式與使用現有裝備，部署過渡性數據通信能力於塔臺和航路環境。漢偉（Honeywell）公司的克里斯・班尼契（Chris Benich），以供應商的身分，表示應以更“大爆炸”的方式引入第一階段數據通信能力，其後，接續引入完整功能的第 2 階段 ATN 能力。

✧ 論壇議程 8：Airports – NextGen begins and ends at the airport

論壇主持人：

Debby McElroy, ACI-NA

論壇成員：

Tom Bock, PANYNJ

Kate Lang, FAA

Steve Vail, Mosaic ATM

Travis Vallin, Jviation

機場在 NextGen 的關鍵角色

北美國際機場協會（Airports Council International -North America）的黛比・麥克爾羅伊（Debby McElroy）及其論壇成員們，提供了另一種聲音，那就是要成功的過渡到 NextGen，機場是不可分割的一部分，而且在 NextGen 規劃和實施的各階段中，皆需將其視爲整體的一部分。FAA 的凱特・朗（Kate Lang）鼓勵機場和當地社區進行開放的對話，以確保他們了解 NextGen 所帶來的利益和可能的解決方案，包括資金部分。

✧ 論壇議程 9：NextGen in 2018-2020 – What is it and how do we get there?

論壇主持人：

Agam Sinha, MITRE

論壇成員：

Pierre Bachelier, Airbus

Nancy Graham, ICAO

Charlie Keegan, Raytheon

John Kefaliotis, ITT

Dale Wright, NATCA

Brian Townsend, US Airways

NextGen 的 2018-2020 年展望

現場提問什麼是 NextGen 最大的非技術性障礙，ICAO 的南茜・格雷厄姆（Nancy Graham）警告說，如果不能解決老舊基礎設施以及文化和融資障礙等問題，美國和歐洲將落後於世界其他地區。美國國家航管協會的戴爾・賴特（Dale Wright）也警告一些誤解－例如管制員的阻撓和 FAA 無法提出大型複雜的規劃，正出現在前進的道路上。多數人同意，變更管理方法將是過渡到 NextGen 的必要元素。

✧ 論壇議程 10: NextGen – What would you tell the 2012 Presidential leadership team?

論壇主持人：

Craig Fuller, AOPA

論壇成員：

Pete Bunce, GAMA

Nick Calio, A4A

Gerald Dillingham, GAO

Dyke Weatherington, OSD

推進 NextGen 的下屆總統領導小組

研討會以活潑，互動式的討論進行，論壇成員皆爲業界幹練之領導者，主持人爲航空器擁有者及駕駛員協會（Aircraft Owners and Pilots Association, AOPA）總裁兼執行長克雷格・富勒，與會者討論他們將給未來總統過渡團隊的意見。鑑於他們的高瞻遠矚，預測下屆美國政府在 2012 年至 2016 年任期結束，將能獲致哪些成就。普通航空業製造商協會（General Aviation Manufacturers Association, GAMA）總裁兼執行長皮特・本斯（Pete Bunce）預見在駕駛艙內的先進科技，包括例行使用 iPad 和電子飛行包應用。美國航空運輸協會總裁兼執行長尼克・加里奧（Nick Calio）預測目前存在的已交付裝備，將會出現可衡量的獲益進展，此外一套行之有效的績效指標，以及一個全國性航空公司政策，也將日漸成形。美國政府責任辦公室（Government Accountability Office,

GAO）實體基礎設施議題部門(Physical Infrastructure Issues)主任杰拉爾德・迪林厄姆（Gerald Dillingham）認爲如果 FAA 的領導階層繼續按照承諾推行，將使該署之信譽更爲增強。

研討會最後由 RTCA 主席瑪格麗特・簡尼（Margaret Jenny）對本次研討會總結：“研討會主題「向 NextGen 的目標邁進」，可謂一語中的，我們不再談論規劃，而是聚焦在如何實現 NextGen “。

參、心得

NextGen（美國次世代航空運輸系統）是預計在 2012 至 2025 年之間橫跨美國階段性建置的新國家空域系統（National Airspace System, NAS）的名稱。NextGen 預備將美國的航空管制系統從老舊的陸基系統，改變成以衛星爲基礎的系統。全球衛星定位系統（GPS）技術將被用於縮短航線，節省時間和燃料，減少交通延誤，提高容量，並讓管制員有更大的安全餘裕，監控和管理航機。航機隔離將能夠更緊密，採取更直接的航路路線，避免機場“堆積”航機等待跑道開放，所造成的延誤。爲了實現以上目的，美國聯邦航空署（FAA）將對整個美國航空運輸系統進行廣泛的改造。這種轉變，目標是減少在空中和機場極端嚴重的全面交通壅塞。2003 年，美國國會成立聯合規劃發展辦公室（JPDO）負責規劃和協調發展 NextGen。

1. 廣播式自動回報監視（Automatic dependent surveillance-broadcast, ADS-B）： ADS-B 系統將使用全球定位系統（GPS）衛星信號，提供航空管制人員和飛行員更準確的資料，這將有助於保持航機在跑道及空中的安全隔離。航機答詢機接收 GPS 信號，並利用它們在空中確定飛機的精確位置。然後將這些數據和其他數據廣播到其他航機和航管單位。一旦 ADS-B 完全建置後，飛行員和空中交通管制員將會首次看到相

同的真時（real-time）空中交通顯示，而大幅提高飛航安全性。爲了實施 ADS-B，美國聯邦航空總署將強制航機裝設必要的航空電子設備。

2. 廣域資料系統管理（System Wide Information Management, SWIM）：SWIM 將提供一種單一基礎架構和資料管理系統，將數據傳送給眾多用戶和應用程式。透過減少介面和系統的數量和類型，SWIM 將能減少數據重覆存放，並更有助於多用戶共享資料。SWIM 也將啓用新的決策模式，使資料更容易取得。

3. NextGen 數據通信。目前飛行組員與飛航管制員，以及管制員之間的通信，主要是透過語音通信來完成。未來將先在飛航管制許可、指示、公告、機組人員請求及報告等，引進雙向溝通的數據通信補充手段。在大多數航機配備數據鏈之後，管制員與飛行員之間常用的一般航管訊息及許可，就可以透過數據鏈傳遞，使得管制員可以處理更多的航機流量。這將提高飛航管制員的生產力、航管容量和安全性。

4. NextGen 網路啓用氣象（Next Generation Network Enabled Weather, NNEW）：每年有百分之七十的 NAS 航班延誤是由於天候不佳所造成。 NNEW 的目標是至少削減一半與天候有關的航班延誤。成千上萬的全球氣象觀測站及感測器，從地面、空中和太空的來源將融入單一的國家氣象資料系統真時更新。

NNEW 的跨國家空域系統將提供一個共同的天氣狀況，並能夠提供更好的航空運輸決策制定。

5. NAS 語音系統（NAS Voice System, NVS）系統：目前有 17 個不同的語音交換系統在 NAS 中使用，其中有些已使用超過 20 年。NVS 將以單一的陸空和地面語音通信系統取代這些舊系統，依 FAA 計畫時程，NVS 會在 2016 年上線使用。

相對於美國正大力推動 NextGen，我國已於民國 100 年建置完成通訊、導航、監視/飛航管理系統。整體來說，台北飛航情報區航路結構較簡單直接，且空域採靜態劃分方式，與美國 NextGen 所面對的國家空域系統複雜程度大為不同，但是在監視方面，都將納入 ADS-B 之建置與運用，美國預計在 2014 年建置完成全國 794 座 ADS-B 接收站臺的基礎建設，目前已完成 400 座左右。而以本區的 ADS-B 建置情況來說，本局已於大屯山、花蓮、臺東、臺中、高雄、金門、馬公、南竿及三貂角等處架設 9 座 ADS-B 接收站臺，涵蓋範圍及於本區各主要航路，亦可涵括部分終端區域監視需求。例如：大屯山站臺可接收包括松山機場，甚或桃園機場場面未受地障遮蔽區域，並裝設有 ADS-B OUT 機載裝備之航機動態。

FAA 近日公佈了一份年度預測顯示，航空旅遊乘客人數未來 20 年將增長近一倍。今年（2012 年）美國各航空公司將搭載 7 億 3

千 2 百萬人次，明年爲 7 億 4 千 6 百萬人次，至 2032 年將爲 12 億人次。「今年，更多人將飛行更長的距離。我們預計這一趨勢在未來幾年內仍將持續。」FAA 代理署長赫爾塔表示「美國人值得擁有一套航空系統，可以跟上我們越來越依賴於空中旅行的步伐。」對 FAA 來說，這一預測是支持該機構努力開發 NextGen 系統的重要依據。

但一些航空專家質疑 FAA 的數據和理由的合理性，認爲空中交通將加倍的聲明是 FAA 解釋爲甚麼需要 NextGen 的宣傳手法，以完成他們想要完成的事情。而另一些人則同意 FAA 的預測，他們以微觀經濟因素（例如空中巴士和波音飛機訂單積壓）以及更大的牽涉到全球經濟的因素爲由；社會經濟因素顯示乘客的需求也在同時上升，航空旅行增加以及伴隨收入的增加。短期前景仍可能疲弱，但最終航空運輸將重返更加正常的成長水準。

而應付這種成長才是真正的挑戰，NextGen 能應付空中交通堵塞，但卻無法對機場中的人流產生影響。地面的情況更複雜，美國某些機場長期堵塞，有實際的空間容量限制，如紐約拉瓜迪亞機場已經擠爆了，也沒有擴建的機會。因此有人提出，美國全國很多小型機場未被充分利用，解決方法的是可以把一部分人流轉移到這些機場，這樣可以在空中交通量增加的情況下，無需建造更多跑道，以同樣的建設獲取更大的客貨運吞吐量。

肆、建議

本次參加 RTCA 年度研討會現場感受美國身爲全球航太科技領導者，無論在大型科技計畫的規劃及建置，皆有完善的作業準備，並且隨著大環境的變化，例如財務經費、新科技出現、政治氛圍等變數，仍能持續找出各方能接受，且服務品質不打折的最後方案。綜觀本局轄下飛航服務航電人員，不乏專業職能優秀人才，如能提升其對橫向跨領域的了解，尤其是對專案企劃整合及如何預劃非技術性障礙的克服方式，相信必能對我國飛航服務建設有莫大之助益。爲使人員獲得上述之能力，建議在預算允許情況下，輪派基層優秀航電人員出席各項國際會議（如 CANSO 等），除了解目前國際上先進國家最新的航空設施發展現況，也進一步了解他國如何在實務上推動各項重大飛航服務建設、克服障礙的方法。

美國爲因應民航空域的壅塞、提高航機飛行效率以減少航班延遲，並節能減碳降低環境污染，遂大力推展 NextGen 的建置，這和我國建置完成 CNS/ATM 的目標不謀而合，但以美國境內不只要解決空域壅塞，尚有後續航機落地後航站客貨運輸容量不足的問題尚待解決，建議本局後續仍須注意配合臺北飛航服務情報區各機場之運輸容量，妥爲運用新飛航管理系統的各項強大功能，以達成安全有序的空中飛航及地面航站客貨運之順暢進出。

RTCA Speech- June 5, 2012
Bill Ayer, Chairman Alaska Air Group

Introduction

- Title Slide
- Good afternoon and thanks for the opportunity to speak with you today. Let me first introduce Gary Beck, our VP-Flight Ops. Gary attended our NAC meeting in Seattle week before last with an update on our NextGen activities, and we thought it would be helpful for this audience to hear some of that- Q&A. Also recognize Marion Blakey- Marion serves on our board and chairs our safety committee. So how many AS FFs here? Thank you for your business- I hope we're doing a decent job for you.

- From the looks of your agenda, you're covering a lot of ground and most of the current issues related to NextGen implementation. And that word implementation is the key. The two fundamental things in business are planning and

execution, and while plans are important, it's the execution of those plans that matters most- you're much better off having a good plan that is very well executed than waiting for the absolute perfect plan that is poorly implemented, or not implemented at all. I think we're at a critical juncture with NextGen and this planning vs. execution question. I believe that the NextGen plan, with all its components, is a very good plan- maybe not perfect, but very good. And so the focus now needs to shift to execution. I am very encouraged that we can collectively execute it well- in a logical sequence, and deliver benefits that justify the investments. One of my themes this afternoon is that we need to decide that's what we're going to do- more execution- let's start really flying these procedures and build more of them, and work to accelerate the entire process.

- I'm not recommending blind faith, but I am advocating that all of us here- airlines, airframe manufacturers,

avionics OEMs, General Aviation, Business Aviation, union leaders, and the FAA- work together like never before. We need to become stronger proponents for this critically important technology. Our attitudes will have a lot to do with the outcome, and whether we think we can or think we can't, that's exactly what we'll do.

- I do realize that Alaska Airlines is not a household name here in Washington, DC, although we serve Reagan Airport from both Seattle and Los Angeles, and starting in August, from Portland. So before I jump into our NextGen story, let me tell you a little bit about us which will help you understand why we're so interested in advancing this technology. We were founded in 1932 in the State of Alaska where, to this day, air travel is more of a necessity than a luxury because of the vast distances and a very limited road system. Our company has been an integral part of the social and economic fabric of the Alaska communities we serve, and so our mind-set is that we're

really in the business of serving communities, not merely flying airplanes. Because of that orientation, we've had a strong focus on people as we've built the airline – on our customers for sure – but also on our employees, who've created a culture of caring and professionalism and what we call "Alaska Spirit." So we have a pretty strong can-do approach built into our DNA.

- Together with our sister carrier Horizon Air, we're the seventh largest airline, but only carry about 3% of domestic traffic. That's a reminder of the market concentration that exists in this industry. We've transformed our company over the past decade and are now being recognized for our industry-leading customer service, on-time performance and financial results. We decided to embark on this transformation plan – which we called the 2010 Plan – back in 2003, just as virtually every other legacy airline decided to call in the lawyers and file Chapter 11. We decided to spend all of our time and

energy working on what is controllable about our business. That's not to say that things like oil prices and the economy aren't important, but it turns out you can mitigate their impacts with decisions about everything else- such as fleet, network, customer service, and non-fuel costs. We set aggressive goals, and went about a process to permanently improve our business in every controllable area.

- Slide #2- Here's today's growing route system, which we fly with 119 737s at Alaska and 48 Q400s at Horizon.

- While we've accomplished a lot over the past decade, I would say that the thing we're proudest of is our record of safety and technology improvements. We have a Board of Directors Safety Committee (as I said earlier, chaired by Marion) which sets a clear tone at the top, a Vice President of Safety overseeing both operating certificates ensuring a single level of safety and compliance at both

carriers, and an employee culture that understands that nothing is more important than a safe and compliant operation. We've been early adopters of every important flight deck technology over the last two decades; we pioneered RNP technology in the mid-90s and now have RNP approach and departure procedures at 27 airports, and we're flying these procedures several times per day at many of these airports. And I'll obviously get more into that in just a moment.

- Given our history, embracing technology came naturally. Just as we pioneered customer-facing technology- we were the first airline to sell tickets over the internet in 1995, being a pioneer with flight technology just seemed like the thing to do. There's no better investment than something that improves safety, provides a better customer experience, simplifies the job for employees and improves profitability. That's what we think NextGen has delivered for us so far, and, with prompt implementation of future initiatives, should continue to deliver.

NextGen

- Our NextGen story goes back to 1996, and to Juneau, Alaska where we developed RNP approaches to achieve lower weather minimums. Juneau is the state capital (how many been there?), and had come under fire by people who wanted to move the capital to the Anchorage area. Like most of our Alaska destinations, there are no roads (to be precise I think there are exactly XX miles of road in and around Juneau but you literally cannot go to any other town) so flying is the only way there. One of their persuasive arguments to move the capital was poor airline reliability due to winter weather and our high minimums- in fact the minimums for best approach at the time- a localizer approach-actually it was an LDA approach- but it was the best you could with all that terrain around the

airport with a ground-based approach, and minimums were a 1200 foot ceiling and 2 miles visibility.

- Slide #3- here it is. 1239 feet and 2 miles. Look at a couple of these notes on the approach chart- note 1- "Any go-around after passing the MAP will not provide standard obstruction clearance"-nice way of saying it, and note 7- "Fly visual to the airport, 068 degrees, 3.2 miles" which includes a turn though a gap in the hills on very short final.

- The weather in the wintertime, which of course is when the legislature convenes, was often below our minimums, with snow and fog being a pretty normal event. Many a legislative hearing was cancelled or delayed waiting for Alaska flight 62 to make it in from Anchorage.

- Having been the first airline to install Head-up guidance systems in our airplanes years earlier (after a

particularly foggy Thanksgiving holiday period in Seattle where we didn't operate a single flight for 2 or 3 days) we had been learning about other technology, and knew that a satellite based RNP approach, approach Juneau from the other direction and landing on runway 26, following a wide river channel but descending below the adjacent mountain tops, could have much lower minimums due to friendlier missed approach terrain. We went to work with the FAA and designed and received approval for this special RNP procedure and here it is- Slide #4- one of the first RNP approach procedures in the US, down to minimums of 300 feet and 1 mile visibility (5000 foot runway visual range). Safety was improved due to the precise navigation, and because of the dramatic reduction in weather cancellations (by about half) the capital has remained in Juneau. Slide #5 – shows pictures of JNU – the RNP approach area on a nice day, and a more typical day

looking east where that old LDA comes through. And here's a short video of the RNP approach into JNU.

- RNP was the key technology and we equipped all of our airplanes and trained all of our crews, and worked with the FAA to develop RNP procedures to every airport and runway in Alaska that didn't have an ILS approach. So now all 19 airports that we serve in Alaska have vertical guidance on final approach, and to every runway. Slide #7- Kodiak, and Slide #8- Sitka (or the USS Sitka!). We also worked with the FAA to develop some procedures in our lower-48 route network that had similar needs due to terrain and no ILS approach (PSP is an example). The benefit is that we've eliminated the use of non-precision and circling approaches, with significant safety and reliability benefits. This simplification has also streamlined our pilot training. While this technology is now being adopted around the world, I believe we are

still the only domestic carrier with a fully equipped fleet with fully trained crews making use of RNP procedures.

Here are our statistics for 2011: we flew nearly 12,776 RNP approach and departure procedures last year, with 1545 “saves” (define) with total savings of just over $19M!! And we saved 210,000 gals of fuel by not having to hold and divert. So we got hooked on this technology because of its very tangible benefits of improving safety and reliability.

- We knew that RNP held much promise for reducing delays in congested airspace, and for reducing fuel burn and emissions by designing approaches with shorter track miles and incorporating continuous descents into the arrival procedures. We started looking at Seatac as our next opportunity- all of our airplanes were equipped and our crews trained, and Horizon had similar potential with their Q400 turboprops. Together, Alaska and Horizon comprise about 50% of the Seatac daily

operations, so we had critical mass. The opportunity was to partner with the FAA and the Port of Seattle and design some new procedures to gain the savings. And because the Seatac airspace and runway configuration present many of the challenges of the heavily congested airports, we knew that this project could serve as a template for advancing NextGen in other parts of the country.

- The project, called "Greener Skies over Seattle" includes new RNP arrivals approaching from over Puget Sound and landing to the south, which is the predominate flow. These procedures will provide shorter, more direct routings, and take advantage of flying over the water to reduce noise. These procedures will also use optimized descent profiles, enabling minimum fuel burn with engines at low power. This means airplanes will spend less time in the air and burn less fuel, which also means a smaller carbon footprint.

Because of the higher altitudes and new routings, we'll also create less noise for 750,000 Puget Sound residents. Slide #9- here's a graphic along with those principles I just mentioned.

- We are making great progress thanks to a wonderful relationship with the FAA and their project team led by Doug Merek (is Doug here?) This is complicated stuff and Doug and his team are rock stars. They've found solution after solution, and nothing has gotten in their way. We have more flight trials scheduled this month, next week in fact, and a first live flight as soon as the first quarter of next year. Slide #10- here's a quick summary of the process, which has been heavy on collaboration and communication. One specific area where our Greener Skies project has benefited has been a great relationship with the air traffic controllers. From nearly the first day of planning, the controllers and NATCA were brought into the discussion. The team asked their opinion and involved them in the

development of the procedures. They added tremendous value, and are enthusiastic supporters as we near the date for the first live flight.

- Interestingly, and I think Doug's team agrees, that the biggest challenges going forward are no longer technical – the airplanes and the avionics perform magnificently. The challenge is making changes and that requires bringing the stakeholders along and building support early in the process. This "Greener Skies" project really is a microcosm of the various challenges that must be met in order to truly modernize the national airspace system. We believe that what we are doing in Seattle and how we are doing it (and the how matters since we're talking about significant change) is something that should be modeled in other projects around the country.

- Slide #11- and here's a picture of that collaboration- getting all the players together, rallying around a

common goal. This collaboration, in my opinion, is the most important aspect of what we're doing in Seattle and the most important lesson for other implementations.

- But as we know, there are many skeptics who don't believe FAA can perform the major overhaul that NextGen represents, and even the term "NextGen" is confusing- it's used for a lot of things, and its lack of specificity, all-up expense and long implementation time creates naysayers, even within the aviation community. A rational airline philosophy is that a technology investment, like any other capital outlay, requires a financial return. That return will improve as the development and implementation of new procedures is accelerated. If you need proof- look at what happened to the sale of WAAS-enabled GPS units for general aviation airplanes when the FAA published 2800 LPV approach procedures at 1400 smaller airports.

- One approach is for more airline/FAA partnerships and to do more projects like our “Greener Skies” project, proving the benefits and making the case. Breaking things down function-by-function and airport-by-airport will allow the teams to apply their learnings and the resulting rule changes and separation standards to each subsequent project. We need to ensure that these projects are coordinated and we don’t have redundant efforts with teams working on the same technical issues at different locations. What the team has developed for Seattle can be directly applied to other airports and airspace.

Conclusion (click to last Slide #12)

- Let me quickly summarize the lessons that we’ve learned in our NextGen journey to date. First is the importance of the plan- a good plan- built with a vision and the conviction to succeed. Then there’s the

implementation, and solid execution requires great partnerships- nothing this complex can be done alone. Speaking for Alaska, we've had very good partnerships with all of our technology projects over the years. To have a great partnership, you have to be a good partner yourself, and people matter- who's on the team can make it or break it. By the way, as with anything this new and challenging, an occasional set-back is to be expected, but leadership's role is to keep the goals in front of the team, to make course corrections, and to maintain a positive outlook by emphasizing the progress that's being made.

- My ask of each of you is to help us form one big and strong partnership to really accelerate the use of this technology. Not that we won't have occasional differences, but if we keep the goal in mind, and recognize the tremendous opportunity before us, I think we'll make the right decisions to benefit our industries,

the economy, and to keep America as the global aviation leader.

Thank you again for the opportunity to speak with you today.

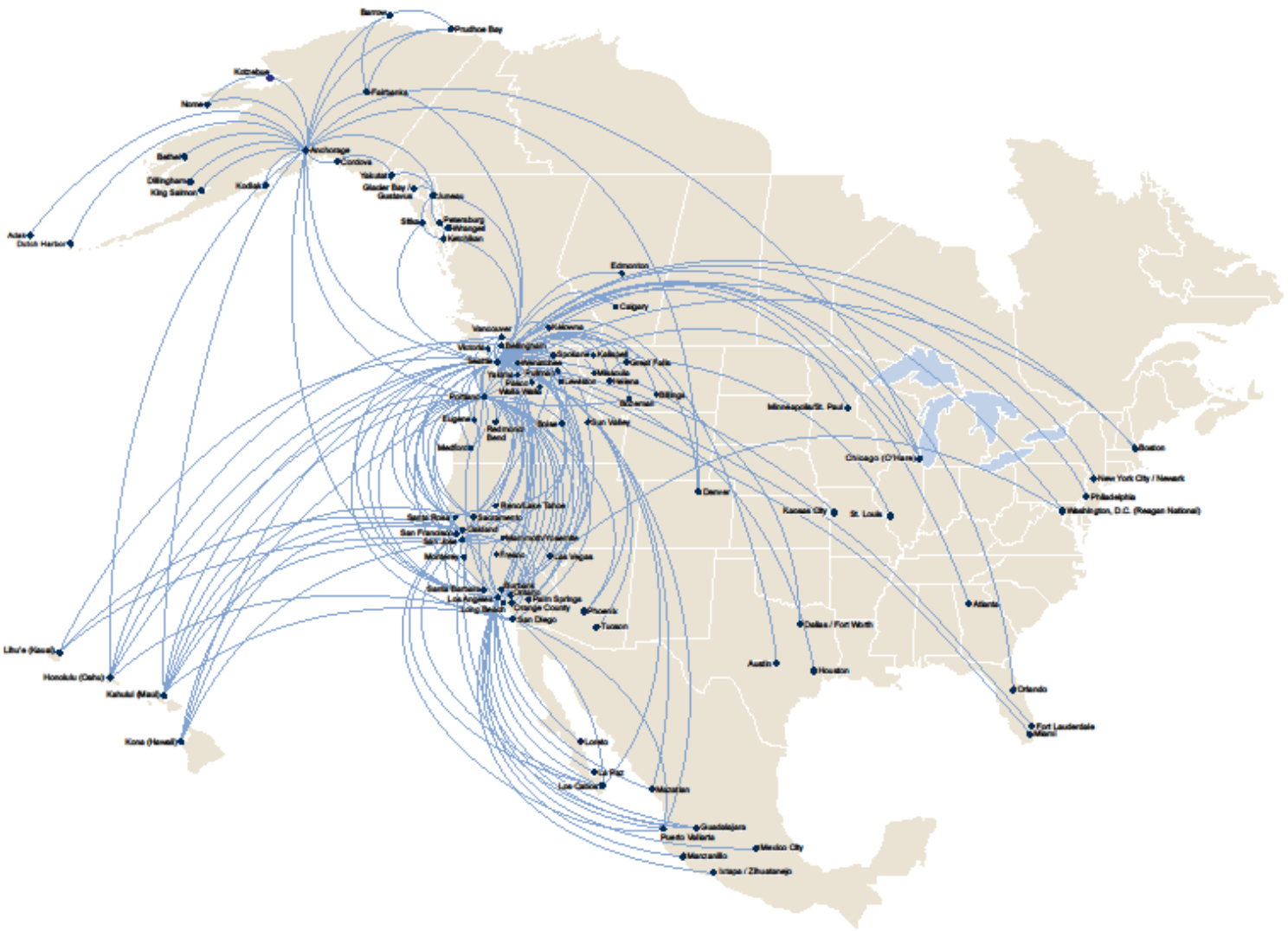
Do we have time for a couple of questions? Gary come up to help.

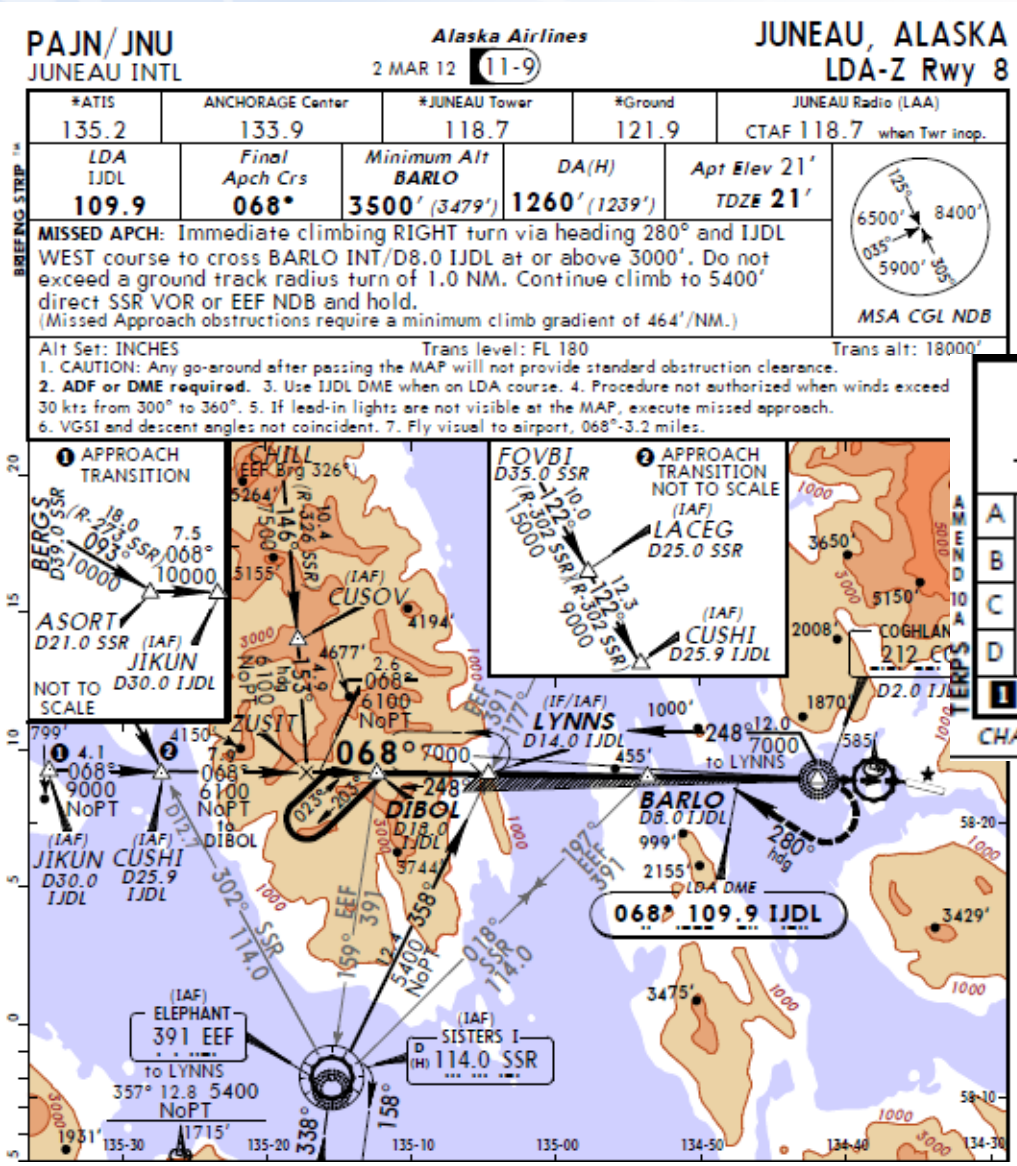
RTCA 2012 Annual Symposium

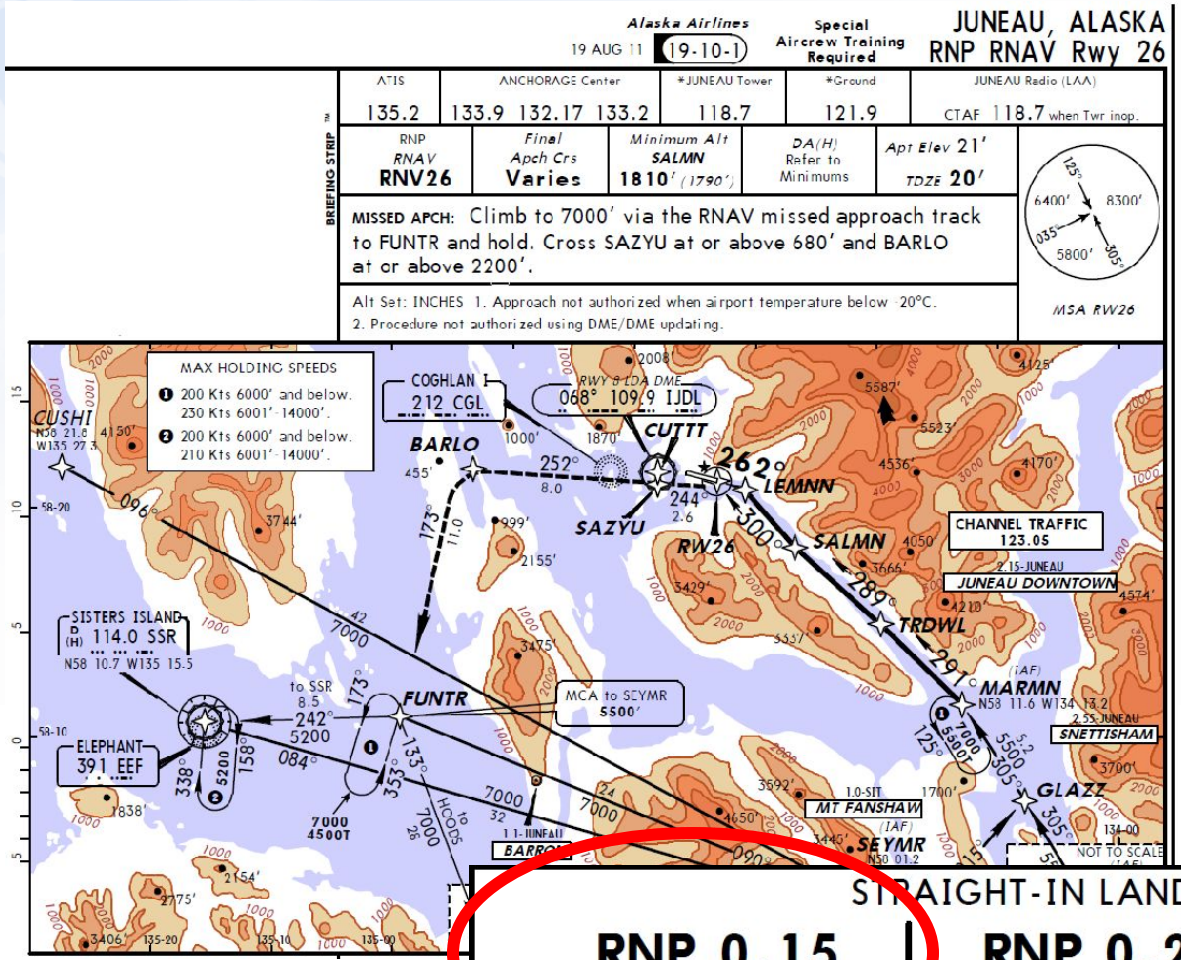
Advancing the Goals of NextGen

Bill Ayer
Chairman, Alaska Air Group

Alaska Air Group's Route Map




PAJN/JNU
JUNEAU INTL
Alaska Airlines
2 MAR 12
11-9
JUNEAU, ALASKA
LDA-Z Rwy 8
*ATIS 135.2
ANCHORAGE Center 133.9
*JUNEAU Tower 118.7
*Ground 121.9
JUNEAU Radio (LAA) CTAF 118.7 when Twr inop.
LDA IJDL 109.9
Final Apch Crs 068°
Minimum Alt BARLO 3500′ (3479′)
DA(H) 1260′ (1239′)
Apt Elev 21′ TDZE 21′
MISSED APCH: Immediate climbing RIGHT turn via heading 280° and IJDL WEST course to cross BARLO INT/D8.0 IJDL at or above 3000′. Do not exceed a ground track radius turn of 1.0 NM. Continue climb to 5400′ direct SSR VOR or EEF NDB and hold.
(Missed Approach obstructions require a minimum climb gradient of 464′/NM.)
MSA CGL NDB
Alt Set: INCHES
Trans level: FL 180
Trans alt: 18000′
1. CAUTION: Any go-around after passing the MAP will not provide standard obstruction clearance.
2. ADF or DME required. 3. Use IJDL DME when on LDA course. 4. Procedure not authorized when winds exceed 30 kts from 300° to 360°. 5. If lead-in lights are not visible at the MAP, execute missed approach.
6. VGSI and descent angles not coincident. 7. Fly visual to airport, 068°-3.2 miles.
APPROACH TRANSITION
NOT TO SCALE
BERGS
ASORT D21.0 SSR (IAF)
JIKUN D30.0 IJDL
CHILL (EEF Brg 326°)
CUSOV (IAF)
ZUSIT
FOVBI D35.0 SSR
APPROACH TRANSITION NOT TO SCALE
LACEG (IAF) D25.0 SSR
CUSHI (IAF) D25.9 IJDL
LYNNS (IF/IAF) D14.0 IJDL
DIBOL D18.0 IJDL
BARLO D8.0 IJDL
JIKUN (IAF) D30.0 IJDL
CUSHI (IAF) D25.9 IJDL
ELEPHANT (IAF) 391 EEF to LYNNS 357° 12.8 5400 NoPT
SISTERS I (IAF) D (H) 114.0 SSR
068° 109.9 IJDL
LDA DME
COGHLAN
AMENDMENTS
STRAIGHT-IN LANDING RWY 8
DA(H) 1260′ (1239′)
A
B
C
D
2
4
If lead-in lights are not visible at MAP, execute missed approa
CHANGES: None.



STRAIGHT-IN LANDING RWY 26

	RNP 0.15	RNP 0.2	RNP 0.3
	DA(H) 336′ (316′)	DA(H) 433′ (413′)	DA(H) 1238′ (1218′)
C D	RVR 50 or 1	RVR 60 or 1¼	4

RNP Vastly Improved Operation

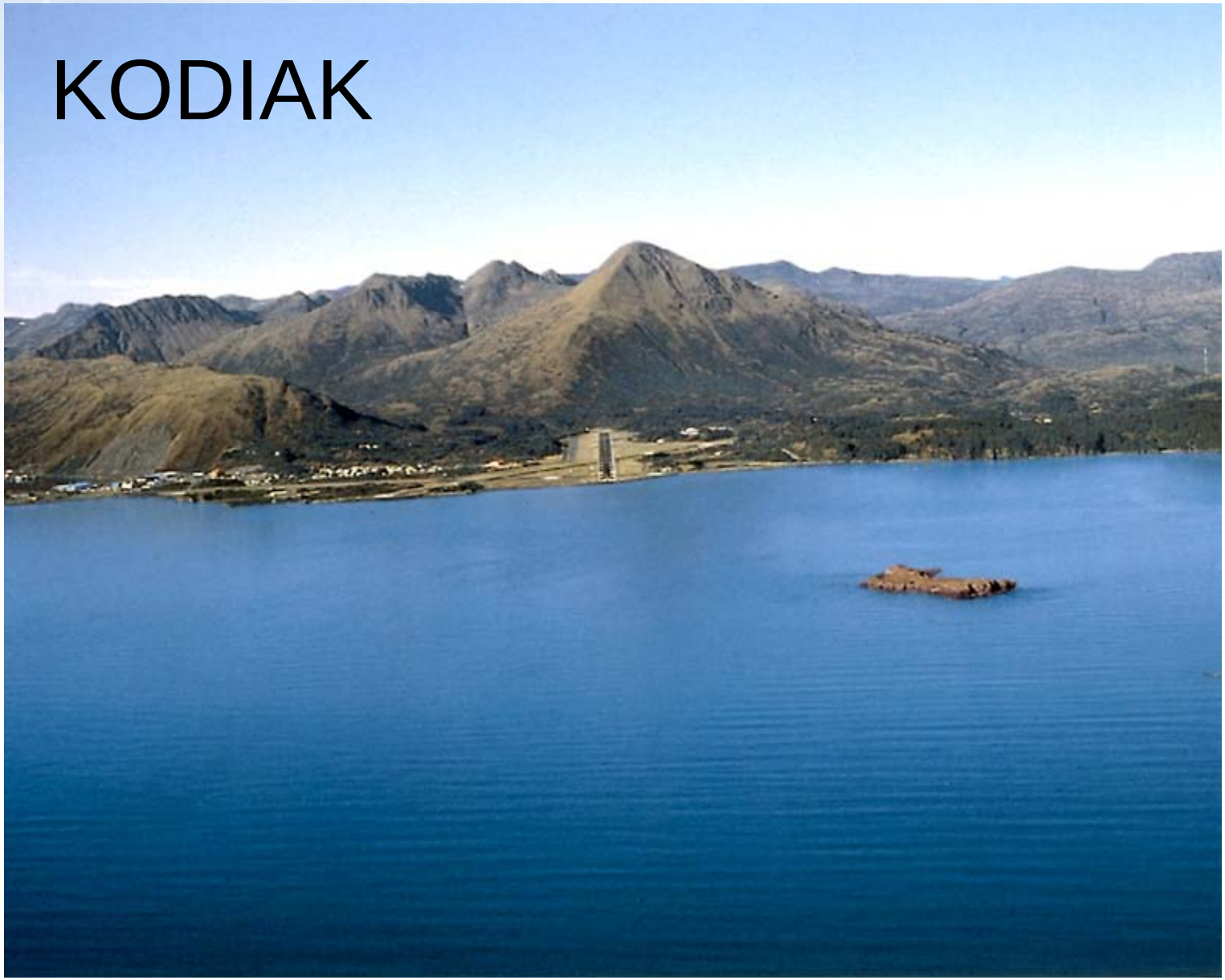
Juneau

Chamber of Commerce Day

Typical Day

- *Cut Diversions/Cancellations in half*
- *Justified the investment*

KODIAK



SITKA

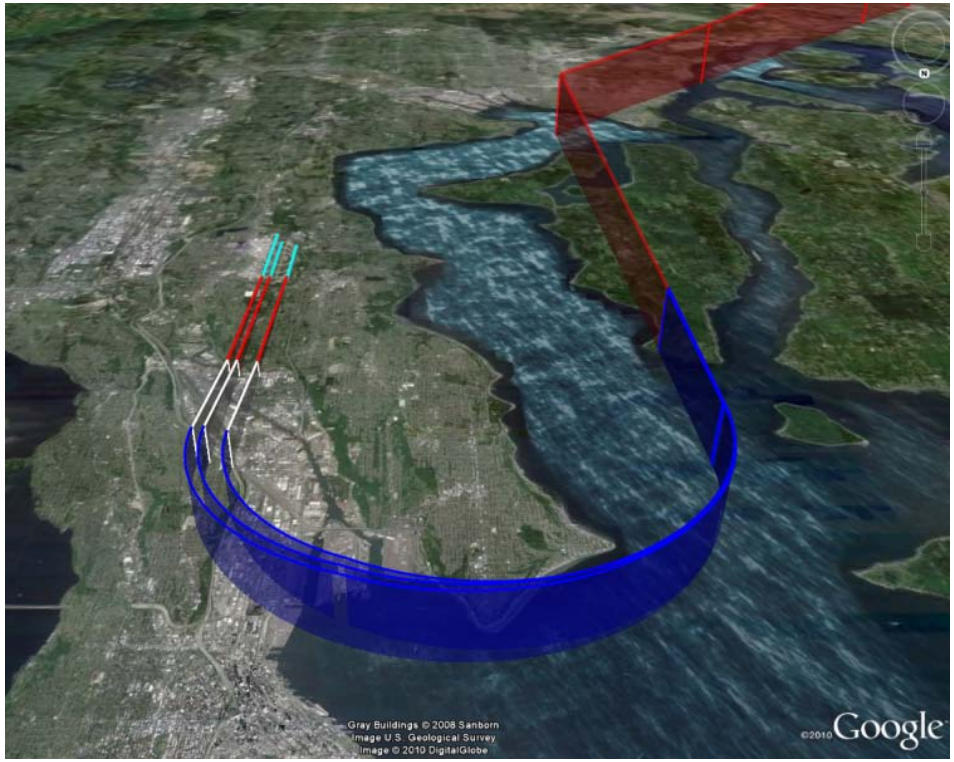
Greener Skies over Seattle

Alaska Airlines' Principles:

- Reduce fuel burn & emissions
- Reduce noise exposure
- Maintain existing or enhance capacity
- No adverse impact to non-equipped users and Boeing Field

Via-

- Placing tracks over water
- Reducing track mileage
- Optimizing descent profiles
- Changing ATC procedures to enhance RNP capability



South Flow from Southwest direction

Alaska Airlines estimates that industry would save over 2 million gallons a year, or $6.8 million

Greener Skies Initiative

- Created FAA/Port of Seattle/Boeing/Airlines team
- Collaboratively created a vision (OPD STARS and RNP approaches)
- Briefed FAA executives
  - Openly challenged ATC procedures
  - NAS-wide implications
- Obtained political leader support
- Collaborated with the controllers early
- June 2010 - FAA's NextGen Management Board approved the project

What makes PBN implementation possible?