

# PARTNERSHIP

## 美中航空合作项目



2018 AIRLINE OPERATIONS SAFETY SYMPOSIUM IN CHONGQING  
2018 运输航空运行安全研讨会在重庆召开



2018 ACCP STANDING COMMITTEE MEETING IN BEIJING  
2018 ACCP 常务委员会议在中国民航局召开



**U.S.-CHINA AVIATION  
COOPERATION PROGRAM**

FEATURE STORIES

**2018 Airline Operations Safety Symposium in Chongqing** Page 9  
2018运输航空运行安全研讨会在重庆召开



CAAC-ACP-Boeing continued their commitment to aviation safety for 2018 with the 4th Annual Airline Operations Safety Symposium on November 13-14, 2018 in Chongqing China.

**CAAC - ACP Civil Aviation Big Data Symposium Held in Beijing** Page 11  
CAAC - ACP在京举行民航大数据研讨会



In recent years, operations safety has become a heated topic in China as the general aviation market continues to expand and develop.

**2019 ACP Daxing International Airport Technical Assistance Workshop Held in Beijing** Page 13  
2019年ACP大兴国际机场技术协助研讨会在京举行

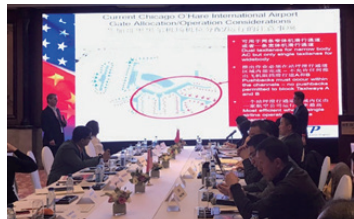


On February 26-28, 2019, ACP in cooperation with Civil Aviation Administration of China (CAAC), Air Traffic Management Bureau (ATMB) and Beijing Daxing International Airport (BDIA) held an ACP Daxing International Airport Technical Assistance Workshop in Beijing.

MEMBER ACTIVITIES

**STRATEGIC PLANNING SERVICES** Page 25  
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 中国各地机场  
 中国民航业界





庄博润 (John Bruns)



邓妮可 (Nicole Didyk Wells)

# Co-Chairs' Message

Dear Members and Colleagues,

We wish to extend a special thanks to our readers for your support of the U.S.-China Aviation Cooperation Program (ACP).

This year is turning into a very busy and fruitful year for all of us. ACP has an ambitious 2019 calendar of activities and meetings important to growing U.S.-China aviation relationship.

While we have done well, we plan to do even better. We can do this because we have a very strong public-private sector team with essential and important support from China's aviation community, including the CAAC.

We also are particularly thankful for the support provided by our USG advisors. Together we introduced several new programs in 2019. This year marks the 14th year of EMDT and 11th year ATMET; these are two of ACP's signature leadership training programs; USTDA and FAA also supported a new ACP workshop series that include eight new activities important to aviation safety, aircraft airworthiness, air traffic, general aviation, and airport development.

In addition, with leadership from The Boeing Company, and an USTDA grant, a new two-year Airport Management and Operations Efficiency Training Program (AMOETP) will start in August. Together, these programs represent multi-million-dollar U.S. assistance efforts that are helpful to both countries.

We also will continue to work closely with Chinese stakeholders to promote positive policy and regulatory change and the benefits of U.S. best practices and technical solutions. ACP is pleased to support activities where US best practice may be applicable for Chinese aviation development. This also gives U.S. companies the opportunity to learn from China through these interactions. Today, for example, ACP and Daxing International Airport are sharing experience to help ensure this highly celebrated infrastructure project will be successful.

With more than 15 years of operations in China, ACP has a good story to tell about the benefits of aviation, collaboration, and the delivery of assistance through ACP's unique public-private partnership. We encourage our readers to learn more about ACP and how you can participate and benefit from joining our ACP team.

We wish to assure our readers that our aviation ties remain enduring. As Co-chairs, it is an honor for us to help lead this esteemed organization of 39 prestigious American companies. Our mission is beneficial to both the United States and China.

Sincerely

John Bruns  
ACP Co-Chair

Nicole Didyk Wells  
ACP Co-Chair

亲爱的会员们、民航界同仁们：

美中航空合作项目 (ACP) 对各位读者的支持表示感谢。

今年对我们所有人来说是繁忙而富有成果的一年。ACP 2019 年工作议程安排了许多对发展中美航空关系具有重要意义的活动和会议。

在良好运营的基础上，我们计划做得更好。我们的工作成果，来自政府和企业间的通力合作，以及中国民航局和其他中国航空界同仁的重要支持。

我们也由衷感谢美国政府部门专家提供的支持。我们将在 2019 年共同开展几个新项目。今年是 ACP 第 14 年举办民航高级管理培训项目 (EMDT) 和第 11 年举办空管高级管理培训项目 (ATMET)；这是 ACP 的两个标志性的领导力培训项目。美国贸易发展署 (USTDA) 和美国联邦航空局 (FAA) 还将筹备一系列 ACP 研讨会，其中包括八个对航空安全，飞机适航，空中交通管理，通用航空和机场发展至关重要的研讨会。

此外，在波音公司的提议和美国贸易发展署的资助下，ACP 将于 8 月启动为期两年的机场高级管理人员培训项目。美国政府和航空业为这些项目提供了数百万美元的支持，中美两国都从中获益。

我们会持续与中国民航业密切合作，促进政策发展，分享美国的最佳实践和技术解决方案。ACP 很高兴将美国最佳实践带来中国并促进民航发展。美国公司也得以通过这些互动向中国学习。如今，ACP 和大兴国际机场互相分享经验，推动这一激动人心的机场建设项目走向成功。

ACP 在中国积累了超过 15 年的运营经验，依托于 ACP 独特的政府行业合作伙伴关系，在航空领域开展多种合作和提供技术支持。我们鼓励读者了解更多有关 ACP 的信息，及如何参与 ACP 团队，并从中受益。

中美两国在民航领域的合作将持续深入。ACP 有 39 家美国会员公司，我们有幸作为 ACP 联合主席领导这个合作组织。ACP 将始终致力于推动中美两国民航发展。

谨致问候！

庄博润

邓妮可

中美航空合作项目  
(ACP) 联席主席

中美航空合作项目  
(ACP) 联席主席



## CAAC - ACP Implementation Procedures for Airworthiness Workshop in Zhuhai

On April 10-12, 2018, CAAC and ACP held an Implementation Procedures for Airworthiness (IPA) Workshop. Featured CAAC speakers included Director General Xu Chaoqun and Deputy Director General Yang Zhenmei. The workshop was joined by 96 representatives from Chinese industry, CAAC regional administrations, educational organizations, FAA, USTDA, and ACP member companies. The purpose of the workshop was to help Chinese and US industry professionals better understand the benefits of the IPA and share best practices.


In October 2017, CAAC and FAA signed the Implementation Procedures for Airworthiness (IPA) under the U.S.-China Bilateral Aviation Safety Agreement (BASA). The BASA IPA is a framework for the two agencies to validate the airworthiness of aviation products for operation in their respective aviation systems.

This IPA Workshop provided a unique opportunity for experts to further identify detailed clauses in the new IPA, discuss the

impact that practical application will have for business, and share experiences and ideas regarding the safety and security of aircraft certification products and practices.

The workshop featured various topics including the scope of the IPA, risk-based validation, industry responsibilities, continued operational safety process, new business models, international supplier management, and TC-PC Split, among others. Panel discussions were also conducted on such subjects as the expected benefits of the IPA and of using international suppliers.

US ACP member companies celebrate the IPA as an agreement that will create a more predictable regulatory environment for aviation products and services. Key metrics that generated the most interest have been project length and technical scope.

ACP has seen the initial benefits of IPA implementation on small-scale projects and looks forward to positive impacts on a broader scale. 

# CAAC - ACP适航实施程序研讨会 会在珠海举行



2018年4月10日至12日，中国民航局和ACP举行了适航实施程序研讨会。来自中国民航局发言人包括徐超群司长及杨桢梅副司长。共有来自中国业界、中国民航地区管理部门、教育机构、美国联邦航空管理局、美国贸易发展署和ACP会员公司的96名代表参加研讨会。研讨会的目的是帮助中国和美国的民航业工作者更好地了解适航实施程序的好处，并分享最佳实践。

中国民航局和美国联邦航空局根据美中双边航空安全协议于2017年10月签署了适航实施程序。双边航空安全协议的适航实施程序是一个框架，由美国联邦航空局和中国民航局用于验证航空产品的适航性，以便在各自的航空系统中运行。

适航性实施程序研讨会为适航专家提供了一个独特的机会，可以进一步确定新的适航实施程序中的详细条款，讨论适航实施程序实际应用对企业的影响，并分享对飞机认证产品和实践的安全性有重要意义的经验和想法。

研讨会的主题和会议涉及适航实施程序的范围、基于风险的验证、行业责任、持续的运营安全流程、新的商业模式、国际供应商管理，TC PC分离及其他重要主题。我们还就适航实施程序的预期收益和使用国际供应商的好处等主题进行了小组讨论。

ACP美国会员公司庆祝适航实施程序作为一项协议，将为航空产品和服务带来更可预测的监管环境。最令人感兴趣的关键指标是可预测的项目长度和可预测的项目技术范围。

我们已经看到适航实施程序的实施对小范围项目的初步好处。ACP期待适航实施程序能带来的更大积极影响。★ACP



## 2018 CAAC-ACP 通用航空运行安全研讨会合影留念

2018年7月31日 北京



## 2018 CAAC-ACP General Aviation Operations Safety Symposium Held in Beijing

In recent years, operations safety has become a heated topic in China as the general aviation market continues to expand and develop. On November 5, 2015, CAAC and ACP signed a Memorandum of Understanding pledging assistance for civil aviation safety in China while acknowledging that safety is the foundation for China's continued aviation growth. The MOU underscores the importance of promoting regular interaction and information exchanges on aviation safety. Since this important signing, CAAC and ACP have held two CAAC-ACP General Aviation Safety Symposia in September 2016 and 2017.

ACP held its third CAAC-ACP General Aviation Operations Safety Symposium on July 31 to August 1, 2018 in Beijing featuring Air Medical Emergency Services. In addition to representatives from CAAC and FAA, expert operators and technology providers shared their air medical operations experience. Over 150 participants attended this day and half Symposium. CAAC Flight Standards Dept. Deputy Director General Zhu Tao, National Health Commission Emergency Office Deputy Director General Yang Feng, and ACP General Aviation Business Aviation Committee Co-Chair/Vice President of NBAA Dough Carr along with FAA Flight Standards Safety Inspector Jody Hemler provided welcome remarks. Also in attendance were CAAC Transportation Dept. Director General Liu Feng and senior representatives from the Ministry of Transportation, other CAAC departments, and hospitals.

In the symposium, representatives from the government and private sector actively exchanged their ideas on various topics including regulations and air medical services sharing between the US and China; maritime search and rescue best practices; US airspace and air medical services; US and China commercial and non-commercial air medical operator overview; professional helicopter emergency rescue services in China; air medical training; fixed-wing aircraft and life-saving air ambulance; China's governmental air medical services; and safety and efficiency balancing.

In the 13<sup>th</sup> Five Year Plan for Civil Aviation, released in February 2017, ensuring continuous safety is listed as the number one priority in the next five years. Following that, in July 2018, CAAC released the "Guiding Opinions on General Aviation Classification Management" to differentiate supervision level on general aviation operations, reflecting that in the future, a clearer classification and differentiation system will be adopted by CAAC and relevant stakeholders.

This symposium played a crucial role in bringing together regulators and operators as well as other stakeholders in the industry to exchange ideas and discuss the future of general aviation air medical services development in China. ☆ACP

# 2018 CAAC-ACP通用航空运行安全研讨会在京召开

近年来，随着中国市场的不断扩大和发展，通用航空运行安全已成为热门话题。中国民航局和ACP于2015年11月5日签署了谅解备忘录，承诺为中国民用航空安全提供支持，并将安全作为中国航空持续增长的基础。该谅解备忘录强调了促进航空安全的定期交流和互动的重要性。自签署以来，中国民航局和ACP已于2016年和2017年举办了两届CAAC-ACP通用航空安全研讨会。

ACP于2018年7月31日至8月1日在北京举办了第三届CAAC-ACP通用航空运行安全研讨会，主题为空中医疗急救服务。中国民航局和美国联邦航空局的代表、空中医疗运营专家和技术提供商也分享了他们的空中医疗运营经验。共有超过150名与会者出席为期一天半的研讨会。中国民航局飞行标准司副司长朱涛、国家卫生健康委员会应急办副主任杨峰、ACP通用航空公务航空委员会联席主席- 美国国家商务航空协会副主席 Doug Carr以及美国联邦航空局飞行标准司通用与商业航空处商业运行航空安全监察员Jody Hemler发表了开幕致辞。中国民航局运输司司长刘锋、交通运输部、中国民航局其他相关部门

和医院的高级代表也参加了研讨会。

研讨会上，政府和私营部门代表就各项议题积极交流了意见，包括中美法规和航空医疗服务共享、海上搜救最佳实践、美国空域和航空医疗服务、中美两国商业性及非商业性航空医疗运营商概述、中国专业直升机应急救援服务、空中医疗培训、固定翼飞机和空中救护车，以及中国政府的航空医疗服务、安全和效率平衡。

2017年2月发布的中国民航“十三五”规划将持续安全列为未来五年的首要任务。2018年7月，中国民航局发布了《通用航空分类管理指导意见》，体现了民航局及有关单位将采用更加明确的分类制度，推进以差异化管理为基础的通用航空治理体系建设。

本次研讨会在促进监管机构、运营商、及业内人士思想交流，和介绍中国通用航空医疗服务发展趋势等方面，起到了至关重要的作用。☆ACP





## 2018 Airline Operations Safety Symposium in Chongqing


CAAC-ACP-Boeing continued their commitment to aviation safety for 2018 with the 4th Annual Airline Operations Safety Symposium on November 13-14, 2018 in Chongqing China. CAAC-ACP-Boeing safety initiatives create unique value through US-China collaboration around China's key aviation safety topics. This four-year partnership has laid a foundation that is driving the importance of safety throughout China's Airspace initiatives. Over 200 people attended this Symposium themed "Loss of Control."

ACP Co-Chair John Bruns, US Consul General Jim Mullinax, and FAA Deputy Executive Director of Flight Standards Service Michael Zenkovich were among the speakers. CAAC Chief Safety Inspector Tang Weibin and CAAC Deputy Director General of Flight Standard Department Zhu Tao led the esteemed Chinese delegation including representatives from CAAC, Air Traffic Management Bureau (ATMB), CAAC regional administrations, and Chinese industry. Representatives from The Boeing Company, United Airlines, Delta, UPS, Polar Air Cargo, and other ACP member companies also attended.

CAAC Chief Safety Inspector Tang Weibin highlighted the importance of enhancing US-China safety cooperation, given that the US and China are the two largest aviation markets in the world. He also emphasized the significant contributions made by ACP to China's aviation development.

The Civil Aviation Safety Symposia were held starting in November 10-12, 2015 in Chengdu. The 2016 and 2017 Symposia were held in Xi'an and Xiamen, respectively. All three events were well attended by industry and regulatory participants from CAAC, Chinese airlines, FAA, and ACP members.

The subjects for each symposium have been carefully selected based on feedback from previous activities and careful consultation with CAAC's Flight Standards Department.

Aviation safety always remains the highest priority for China's growing aviation system. We look forward to continuing our collaborative relationship to promote aviation safety. 

## 2018运输航空运行安全研讨会在重庆召开

**中** 国民航局、美中航空合作项目(ACP)、波音公司于2018年11月13日至14日在中国重庆举办了第四届年度航空公司运营安全研讨会。围绕中国航空关键安全主题，三家主办单位继续致力于以中美合作创造独特价值。这一延续四年的合作伙伴关系通过中国空域倡议，奠定了加强航空安全的基础。本次研讨会的主题为“飞机失控”，共有超过200名代表参会。

ACP联席主席庄博润、美国驻成都领事馆总领事林杰伟、美国联邦航空局飞行标准服务副执行主任Michael Zenkovich出席并发表演讲。中国民航局安全总监唐伟斌和中国民航局飞行标准司副司长朱涛与中国民航局、空中交通管理局、民航局地区管理局以及中国民航业界代表共同出席会议。此外还有来自波音公司、美国联合航空公司、美国达美航空公司、美国联合包裹公司和美国博立航空公司等各ACP会员公司的代表参加。

中国民航局安全总监唐伟斌强调了加强中美安全合作的重要性和必要性，因为美国和中国是世界上最大的两个航空市场。他还强调了ACP对中国航空发展的重要性及其杰出贡献。

2015年运输航空运行安全研讨会于11月10日至12日在成都举行；2016年和2017年两届研讨会分别在西安和厦门举行；以上三场研讨会均得到了来自中国民航局，中国航空公司，美国联邦航空局和美中航空合作项目的广泛参与。

每场研讨会的主题都是根据前序活动的反馈，与中国民航局飞行标准司的仔细商讨，挑选而出。

航空安全始终是中国不断发展的航空系统的首要任务。我们期待继续保持合作关系，促进航空安全。★ACP



## 2018 Civil Aviation Big Data Symposium 2018年民航大数据研讨会



### CAAC - ACP Civil Aviation Big Data Symposium Held in Beijing

In keeping with ACP's commitment to help further aviation safety, ACP held its first Civil Aviation Big Data Symposium on November 28-30 in Beijing. The topic of the symposium was "Using Big Data to Enhance Operations Efficiency and Safety", and played host to representatives from CAAC and the FAA, as well as operators, technology providers, and researchers to share their knowledge and experience. Over 300 participants attended this two-and-a-half-day symposium.

Among others, CAAC Chief Engineer Yin Shijun; Operation Supervisory Center Deputy Director General Tian Zhencai; US Embassy Minister Counselor for Economic Affairs Matt Murray; and ACP Co-Chair and the then President of Boeing China John Bruns provided welcome remarks. FAA Office of Investigation and Prevention, Deputy Executive Director Warren Randolph and Office of Aviation Safety, Deputy Director General Captain Liu Qinggui provided keynote speeches. We also were joined by CAAC's Office of Aviation Safety, Operation Supervisory Center, ATMB, other CAAC departments; representatives from 32 Chinese airports and 43 Chinese airlines were in attendance.

The FAA and CAAC authorities shared the collection and usage of data from a regulator's viewpoint and encouraged broad and profound government-industry collaboration leveraging big data to improve operational efficiency and aviation safety.

During the first two days, the data experts from both the U.S. and Chinese civil aviation industry presented their advanced concepts and accomplishments in data capture, storage and analysis. The information service entities tracked a substantial amount of the world's commercial fleet, an average of 100,000 flights per day, to improve on-time performance and developed an intelligent service mode. The airlines and airports' internal systems integrated vast amounts of data from the entire enterprise and enabled real-time improvement and decision-making. The manufacturers and technical solution providers demonstrated the technologies on evidence-based training, predictive maintenance and optimized connectivity, etc.

The third day focused on the Flight Operations Quality Assurance (FOQA). Experts from both countries elaborated on the regulatory and non-regulatory data-driven flight safety management commitments and activities. Industry representatives demonstrated the application of big data on aircraft fault alerting, flight monitoring, and pilot training.

The conclusion of the first Civil Aviation Big Data Symposium was a significant step forward in strengthening big data utilization exchange between the U.S. and Chinese aviation authority and civil aviation industry. Both countries wish to continue sharing the experiences and lessons learned of utilizing big data in all aviation domains in the future. 

## CAAC - ACP 在京举行民航大数据研讨会

ACP于11月28日至30日在北京举办了首届民航大数据研讨会，从而兑现了ACP进一步支持航空安全相关活动的承诺。该研讨会以利用大数据提高运营效率和航空安全为主题。除了来自中国民航局和美国联邦航空局的代表，运营商、技术提供商和研究人员分享了他们的知识和经验。300多名与会者参加了为期两天半的研讨会。

中国民航局总工程师殷时军、中国民航局运控中心副主任田振才、美国驻华大使馆经济处公使衔参赞莫雷和时任波音中国总裁及ACP联席主席庄博润发表致辞。美国联邦航空局调查和预防办公室副执行主任Warren Randolph和航空安全办公室副主任刘清贵发表主题演讲。此外，中国民航局航空安全办公室、运控中心、空管局、其他中国民航局部门以及来自32个中国机场和43家中国航空公司的代表出席了会议。

美国联邦航空局和中国民航局从监管者视角分享了收集和利用数据，并鼓励更广泛深入政府 - 行业合作，利用大数据来提高

运营效率和航空安全。

研讨会前两天，来自美国和中国民航业的数据专家介绍了他们在数据采集、存储和分析方面的先进理念和成就。信息服务机构追踪全球民航机队平均每天10万次航班，以提升准点率和开发智能服务模式。航空公司和机场以各自研发的内部系统整合了整个企业的大量数据，实现实时改进和决策。航空制造企业和技术解决方案提供商展示了基于证据的培训、预测性维修和互联技术。会议第三天以飞行品质监控（FOQA）为焦点。两国的专家详细阐述了监管和非监管数据驱动的飞行安全管理承诺和活动。行业代表展示了大数据在飞机故障警报、飞行监控和飞行员培训中的应用。

第一届民航大数据研讨会的圆满落幕标志着美中航空管理局和民航业加强利用大数据交流的重要一步。两国都希望在未来继续交流航空各领域利用大数据的经验。 ☆ACP





## 2019 ACP Daxing International Airport Technical Assistance Workshop Held in Beijing

On February 26-28, 2019, ACP in cooperation with Civil Aviation Administration of China (CAAC), Air Traffic Management Bureau (ATMB) and Beijing Daxing International Airport (BDIA) held an ACP Daxing International Airport Technical Assistance Workshop in Beijing. Detailed discussions were held on V-shape runway operations, ramp control and metroplex operations.

The workshop included representatives from Federal Aviation Administration (FAA), American Airlines, Delta Airlines, United Airlines, Strategic Planning Services (SPS), Landrum & Brown, Honeywell, Textron, Gulfstream, IAAC and Boeing. The Boeing Company was the primary sponsor for the workshop, which included a half-day airport site visit. The ACP team was impressed with the progress Daxing International Airport has made with a planned airport opening in September of this year. Chinese attendees came from many stakeholders including

CAAC, CAAC Air Traffic Regulation Office, CAAC North China Regional Administration, CAAC Southwest Regional Administration, ATMB, North China ATMB, Southwest China ATMB, Capital Airports Holding Company, Beijing Daxing International Airport, Chengdu Shuangliu International Airport, China Southern, China Eastern and China United. CAAC Deputy Director General Zhu Wenxin, CAAC ATMB Deputy Director General Ma Bing, North China ATMB Deputy Director General Yan Xiaodong, Daxing Airport Management Center Executive Vice President Sun Chunjing and Chengdu Shuangliu International Airport Vice President Lin Qing attended the workshop.

Daxing Airport Management Center, Executive Vice President Sun expressed interest in establishing a long-term communication platform with ACP while recognizing the value they gained from this workshop. ☆ACP

## 2019年ACP大兴国际机场技术协助研讨会在京举行

2019年2月26-28日，美中航空合作项目（ACP）在北京与中国民用航空局（CAAC），中国民航局空管局（ATMB）和北京大兴国际机场合作举办了ACP大兴国际机场技术协助研讨会。会议议题聚焦V型跑道运行、机坪管制和大都市区多机场协调运行。

研讨会美方代表分别来自：美国联邦航空局，美国航空公司，达美航空，美国联合航空公司，航空战略规划服务公司，兰德隆布朗公司，霍尼韦尔，德事隆公司，湾流公司，波音公司和IAAC咨询公司。此外，波音公司作为本次研讨会的主要赞助方出席会议。研讨会包含半天的大兴机场现场考察交流。大兴机场计划在今年九月开航，ACP美方专家组对

于大兴机场到目前已取得的进展表示赞叹。

研讨会中方代表分别来自：中国民航局，民航局空管办，民航局华北地区管理局，民航局西南地区管理局，中国民航局空管局，华北空管局，西南空管局，首都机场集团，北京大兴国际机场，成都双流国际机场，南航、东航和中联航。民航局机场司副司长朱文欣，民航局空管局副局长马兵，华北空管局副局长颜晓东，大兴机场管理中心常务副总经理孙春京，成都双流国际机场副总经理林馨出席了研讨会。

大兴机场管理中心常务副总经理孙春京表示希望与ACP平台建立长效沟通机制。ACP举办的研讨会有很高的含金量。☆ACP

# THE COST OF TRAVEL DISRUPTIONS

By Cirium

**F**light disruption costs airlines between \$25B and \$35B annually. Taking into account the estimated cost to travelers, corporations, and the rest of the ecosystem, that number goes up to \$60 billion.

Given the magnitude of this, it may be surprising to know travel disruption events are often managed manually.

A J.D. Power study found that 42% of travelers identified disruption management as the single most important area for improvement.

To look at the impact of travel disruptions, last year we conducted and sponsored surveys, held meetings and looked at the latest research into the disruption puzzle.

## The cost factor — Travel budgets under pressure

Disruption increases costs for everyone, so while flight disruption is not a new problem, it is a very expensive one. We highlighted the cost of flight disruption at the beginning of this article:

- Flight disruption costs airlines between \$25B and \$35B annually – about 5% of airline revenue.
- If you include the estimated cost to travelers, corporations, and the rest of the ecosystem, that number goes up to \$60 billion (about 8% of airline revenue).

Increased call volume, both from agencies to airlines and travelers to airlines, means increased costs for airlines and TMCs. The untimely distribution, inefficient delivery and unstandardized terms of travel waivers also create additional operational and time costs for TMCs.

For airlines and airports, apart from the increased costs from more calls, disruptions also cause additional operational and labour costs.

To further complicate matters, disruption events often spread virally, because the flight that was cancelled in one city was supposed to provide the aircraft for a departure from another city. We've all experienced the consequences of these "viral" delays in the system. But, have TMCs, airlines operation centers and corporate travel managers added in the hidden costs? Some hidden costs of disruption include:

- Lost productivity and missed business meetings
- Un-planned hotel stays, meals, rental cars and other expenses
- Traveler stress & frustration
- Employee turnover
- Increased traveler risk

## The human factor — Travelers expect more

We've identified, with the help of our customers and partners, several key steps to effective disruption management, and they include:

1. Get the right information, to the right people, at the right time

2. React quickly and efficiently
3. Involve your TMC
4. Make on-time performance part of your program

So, as we've learned, travel disruption is a long-standing issue in the industry. Understanding disruption is important, however, it's not safe to assume there are optimized solutions to manage disruption related issues. Stakeholders including business road warriors, enterprise travel programs, and, airline and TMC operations' centers still struggle to communicate during disruption events.

Some disruptions are uncontrollable, but when a disruption event happens, the traveler experience can vary a lot depending on how they are managed. Delayed re-accommodation can lead to traveler stress and decreased loyalty. Travelers now expect both timely notifications of disruptions, and self and full-service options. Finally, the difference between a proactive re-accommodation service and a reactive one can be the deciding factor for a company to retain a loyal customer, or lose one for good.

Most airlines and TMCs understand that the traveler experience is not only at the point of sales, but also pre-trip and during the trip. Therefore, having the ability to intelligently monitor flights within trips to alert agents and travelers in the timeliest manner possible, and offer proactive re-accommodation services, will not only greatly enhance the traveler experience, it will also put companies ahead of their competition.

## The load factor — Planes are flying full

Travel disruption is any deviation from the original plan of any trip. Disruptors include flight delays, cancellations, and diversions. We also need to consider increases in the average passenger load, which results in fewer empty seats. This then translates into a decrease in re-booking options over time.

According to IATA, Asia-Pacific led global passenger traffic growth in 2018, driven by robust regional economic expansion and an increase in route options for travelers. Capacity rose 6.4%, and load factor ticked up 0.7 percentage point to 80.6%.

DECEMBER 2018 (% YEAR-ON-YEAR)	WORLD SHARE <sup>1</sup>	RPK	ASK	PLF (%-PT) <sup>2</sup>	PLF (LEVEL) <sup>3</sup>
Total Market	100.0%	5.3%	6.1%	-0.6%	80.4%
Africa	2.1%	2.1%	1.6%	0.4%	72.4%
Asia Pacific	34.5%	6.4%	6.7%	-0.2%	81.0%
Europe	26.7%	7.8%	8.8%	-0.8%	81.0%
Latin America	5.1%	6.0%	5.4%	0.4%	81.8%
Middle East	9.2%	0.0%	4.2%	-3.1%	73.6%
North America	22.4%	3.6%	4.0%	-0.3%	82.5%

SOURCE: IATA



Among 12 major carriers in Asia-Pacific, passenger traffic climbed 8.3%, and passenger load factor rose half a point to 81.5%, Cirium data shows.


#### Asia-Pacific, 2018

Airline/group	Passengers		RPK		ASK		Load factor	
	(m)	change %	change %	change %	change %	%	change (pt)	
Air China Group	109.7	8.0	9.6	10.4	80.6	-0.6		
Air New Zealand	17.3	5.7	6.5	5.4	83.2	0.9		
All Nippon Airways	54.2	1.0	2.9	1.4	73.7	1.1		
Cathay Pacific Group	35.5	1.9	3.1	3.5	84.1	-0.3		
China Airlines	15.6	3.2	3.9	4.6	79.5	-0.5		
China Eastern Airlines	122.5	9.7	9.9	8.1	83.1	1.4		
China Southern Air Holding	139.9	10.8	12.3	12.0	82.4	0.2		
IndiGo	61.8	25.6	25.4	25.1	86.9	0.2		
Japan Airlines	34.9	2.8	5.1	3.8	78.7	0.9		
Jet Airways	27.4	4.6	8.7	7.1	83.7	1.2		
Singapore Airlines	20.4	4.7	5.2	2.7	83.0	1.9		
Thai Airways International	19.7	-0.8	0.1	2.3	78.1	-1.7		
<b>Total</b>	<b>658.8</b>	<b>8.3</b>	<b>8.3</b>	<b>7.7</b>	<b>81.5</b>	<b>0.5</b>		

SOURCE: CIRIUM DATA

Cancelled flights lead to a larger increase in passenger trip delays under high-load rates than under low load rates. Small disruptions

may have non-linear, exponential affects in the complex world of operations, with multiple factors converging, such as call centers' operators, the load capacity and even time of day! Delays late in the day lead to much longer re-accommodation when re-booking options are tighter.

In conclusion, there are multiple factors affecting travel disruptions and the cost of disruptions is too much for the industry to ignore. The good news is we've recently seen an uptick in innovative approaches implemented, to pro-actively manage disruption. For example, there have been new efforts to audit the hidden costs in corporate travel programs, to then ID those most affected by disruption, and to implement solutions that intelligently connect platforms and stakeholder communications. 

Find out more at [cirium.com](http://cirium.com)

## 旅行中断的成本

撰稿：Cirium 公司

**航**空公司每年因航班中断产生的费用约为250亿至350亿美元。如再将旅客、公司和其他方面的预估成本等因素考虑进去，这一数字将升至600亿美元。

考虑到这种情况的严重性，在得知旅行中断事件通常是手动管理更令人吃惊。

J.D. Power进行的一项研究显示，42%的旅客表示，对于中断事件的管理是最重要的待改善问题。

为了解旅行中断问题的影响，去年我们开展并委托了多项调研，举行会议并关注关于中断问题的最新研究。

### 成本因素 - 旅行预算面临压力

每个人都会因为旅行中断而增加成本，尽管航班中断不是新问题，但却是代价极其高昂的问题。本文开篇便重点提到了航班中断的高昂成本：

- 航空公司每年因航班中断产生的费用约为250亿至350亿美元，相当于其营收的5%。
- 如果再进一步考虑旅客、公司和其他方面的预估成本，这一数字将升至600亿美元（约为其营收的8%）。

旅行社对航空公司和旅客对航空公司的通话量增加意味着航空公司和旅行管理平台(TMC)的成本增加。分发不及时、交付效率低以及旅行豁免条款不规范等因素也增加了TMC的运营和时间成本。

对于航空公司和机场而言，除了通话量增加引起的成本上升，中断事件还可能导致其他运营和人力成本增加。

更复杂的是，中断事件通常会广泛蔓延，因为在一座城市被取消的航班本应在另一座城市作为出发航班。我们都经历过这种系统“连锁式”延误产生的后果。但是，TMC、航空公司运营中心和公司旅行经理是否会面对额外增加的隐性成本呢？

中断事件的部分隐性成本包括：

- 生产力损失和错过商务会议
- 计划外的酒店入住、餐饮、租车和其他支出
- 旅行者的压力和挫折感
- 员工流失率
- 旅客风险增加

### 与“人”相关的因素 - 旅行者有更多期望

在我们的客户和合作伙伴的帮助下，我们确定了有效管理中断事件的主要步骤，包括：

- 1 在合适的时间向合适的人员发布合适的信息
- 2 快速、高效地作出反应
- 3 让TMC参与其中
- 4 将准点率作为计划的组成部分

因此，正如我们所知，旅行中断事件是这个行业长期存在的问题。了解中断事件非常重要，但我们不应假设目前已有管理中中断事件相关问题的优化解决方案。在发生中断事件时，商务旅客、公司旅行计划、航空公司和TMC运营中心等利益相关方之间的沟通仍是困难重重。

某些中断事件无法控制，但当其发生时，如何管理中断事件可能对旅客体验造成显著差异。迟迟未完成行程重新规划可能导致旅行者压力增加，忠诚度降低。现在，旅客既希望得到及时的服务中断通知，也希望得到自助和全方位服务的选择。最后，是积极主动还是消极被动地提供行程重新规划服务可能成为公司留住忠诚顾客或是永远失去顾客的决定因素。

多数航空公司和TMC都明白旅客体验不仅仅体现在销售的过程中，还体现在行程之前和行程中。因此，有能力在旅程中对航班进行智能监控，以尽可能及时的方式提醒旅行社和旅客，并积极主动地提供行程重新规划服务，不仅可大大提升旅客体验，还有助于公司领先竞争对手。

2018年12月 (年同比%)	全球份额-1	RPK	ASK	PLF (%-PT)-2	PLF (LEVEL)-3
市场总计	100.0%	5.3%	6.1%	-0.6%	80.4%
非洲	2.1%	2.1%	1.6%	0.4%	72.4%
亚太地区	34.5%	6.4%	6.7%	-0.2%	81.0%
欧洲	26.7%	7.8%	8.8%	-0.8%	81.0%
拉美	5.1%	6.0%	5.4%	0.4%	81.8%
中东	9.2%	0.0%	4.2%	-3.1%	73.6%
北美	22.4%	3.6%	4.0%	-0.3%	82.5%

(资料来源：IATA 数据)

Cirium的数据显示，亚太区12家主要航空公司的客流量增加8.3%，客座率上升0.5个百分点，达到81.5%。

亚太地区，2018年						
航空公司/航空集团	旅客		RPK	ASK	客座率	
	(百万)	变动%	变动%	变动%	%	变动%
中国国航	109.7	8.0	9.6	10.4	80.6	-0.6
新西兰航空	17.3	5.7	6.5	5.4	83.2	0.9
全日空	54.2	1.0	2.9	1.4	73.7	1.1
国泰航空	35.5	1.9	3.1	3.5	84.1	-0.3
中华航空	15.6	3.2	3.9	4.6	79.5	-0.5
中国东方航空	122.5	9.7	9.9	8.1	83.1	1.4
中国南方航空	139.9	10.8	12.3	12.0	82.4	0.2
印度靛蓝航空	61.8	25.6	25.4	25.1	86.9	0.2
日本航空	34.9	2.8	5.1	3.8	78.7	0.9
捷特航空	27.4	4.6	8.7	7.1	83.7	1.2
新加坡航空	20.4	4.7	5.2	2.7	83.0	1.9
泰国航空	19.7	-0.8	0.1	2.3	78.1	-1.7
总计	658.8	8.3	8.3	7.7	81.5	0.5

(资料来源：Cirium 数据)

航班取消会导致高运力下的航班延误比低运力下的航班延误增加更多。在复杂的运营领域，由于呼叫中心操作人员、运力，甚至一天中的具体时间等多重因素的汇集，小的中断事件可能产生非线性、指数性影响。如在一天的较晚时间发生延误，可能因为重新预订的选择趋紧，导致行程重新规划时间拉长。

总而言之，影响旅行中断的因素很多，中断事件的成本极高，

## 运力因素 - 飞机荷载过满

旅行中断是指偏离行程原定计划的事件。中断事件包括航班延误、取消和备降等。我们还需考虑平均客座率增加，导致空位减少。这意味着随着时间的推移，重新预订的选择将逐步缩小。

国际航空运输协会(IATA)提供的数据显示，由于地区经济强劲扩张及旅客选择增加，亚太地区领跑2018年全球客流增长。运力提高了6.4%，客座率提高了0.7个百分点，达到了80.6%。

这不容忽视。值得高兴的是，我们最近注意到业内实施创新方法主动管理中断事件有所增加。例如，在审核企业旅行计划隐性成本方面作出新努力，确定受中断事件影响最大的人员，实施相关解决方案，智能连接平台和利益相关方通讯。☆ACP

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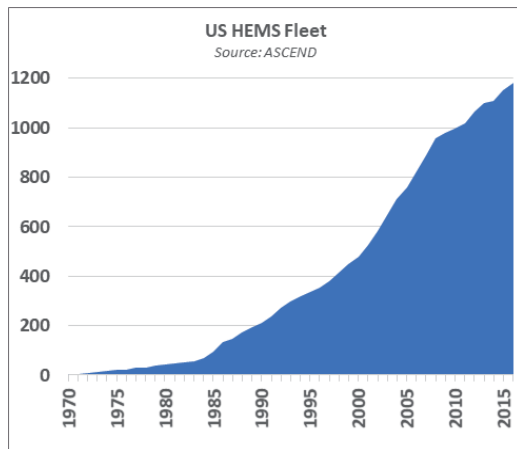
# WE NEED AN EFFECTIVE AIR MEDICAL SERVICES NETWORK IN CHINA – FAST.

By Bell

In the 1950s, the US military started to use helicopters to evacuate wounded patients in conflict zones. Shortly after that, the U.S. government launched the Military Assistance to Safety & Traffic (MAST) program which uses military & public safety helicopters to provide Air Medical Services (AMS) across the country.

AMS helicopters are designed to quickly transport injured patients to healthcare facilities during transport. Immediate care can also be provided as the aircraft are outfitted with specialized equipment such as stretchers, ECG & CPR machines. And of course - Professional health care personnel are also aboard.

The development of AMS has greatly evolved, in the mid-1980s, helicopters expanded into the commercial sector leading to exponential growth from 1990s onwards.



US HEMS helicopter fleet growing fast in last 20 years  
美国紧急医疗救援(HEMS) 直升机机队规模过去20年的发展趋势

Today, there are more than 1,200 Helicopter Emergency Medical Services (HEMS) helicopters operating in the U.S. for approximately 320 million people or that's about 267,000 people per operating HEMS helicopter.

Based on the statistics in the U.S., China should, in theory, have approximately 5,243 HEMS helicopters to effectively and efficiently provide these services to its growing population. However, today there are less than 100 HEMS helicopters in operation in China, for approximately 1.4 billion people, which makes China the most populated country in the world – with an extremely low coverage of AMS. What this means for those of us living in this wonderful country, is that in case of emergency, we most likely cannot benefit from the most efficient and effective way to get medical care, which is quite scary and puts us at a higher risk.

You see, this is why AMS is so important. It has been proven to

help decrease mortality rates and improve medical outcomes. According to research statistics, HEMS helicopters can decrease 35%–55% predicted mortality compared to the traditional ground transportation. And this is exactly why it's so important to set up such a network – as soon as possible.

	China 中国	United States 美国
Population 人口	1,373,541,278 (2016)	323,995,528 (2016)
Area 国土面积	9,596,960 sq. km平方千米	9,833,517 sq. km平方千米
Physicians density 医生密度	1.49 physicians医生 / 1,000 population人 (2011)	2.55 physicians医生 / 1,000 population人 (2013)
Hospital bed density 医院床位密度	3.8 beds 张床位 / 1,000 population人(2011)	2.9 beds张床位 / 1,000 population人(2011)


In 2016, more than 260,000 traffic accident deaths were recorded in China, some of which, according to the above statistics, could have potentially been prevented if there had been an existing and mature AMS network. This is a sad thought.

The positive news is that this has been recognized and is becoming a priority for the country, as emphasized by President Xi of China during the 19th CPC National Congress, “Improving the people’s wellbeing and providing access to healthcare is critical to becoming a modern, developed society.” We salute China for this initiative. But as China looks to tackle this primordial and potentially daunting task, where should they begin?

Well, there is probably no need to reinvent the wheel, or in this case, reinvent the “blade”? There are pioneers such as Bell who have been delivering these highly technologically advanced aircraft all over the world to operators since what feels like the beginning of time.

Collaborating closely with experienced helicopter manufacturers such as Bell and learning from other established networks, operators and programs such as MAST is a good place to start.

Bell, has been vocal about its intentions and vowed to support China in developing AMS that are safe, efficient and economically sustainable. To do so, they have been working closely with local operators, such as Shaanxi Helicopters, who have ordered 100 Bell 407 helicopters to set up a long needed AMS network. We are not yet reaching 5243 helicopters but it's certainly a start. On top of that, Bell is taking it the extra mile and has also been collaborating with regulators, provinces and the medical community in China to share its 80 years of aviation expertise and best practices. “Sharing is caring” as they say in the U.S. and this is a very positive initiative.

By learning from this pioneer, it looks like China could be well on its way to developing a safe and efficient world class Air Medical Services network. Now how fast will we go? Ready, set, go! 



Bell helicopters are used worldwide as air ambulances  
贝尔直升机在全世界范围内执行医疗救援任务



Xi'an based operator Shaanxi Helicopter(SHC) is determined to build an AMS network in China.  
位于陕西西安的陕直股份致力于建设覆盖中国的空中医疗救援网络

## 中国急需高效的空中医疗救援网络

撰稿：贝尔直升机公司

上世纪50年代，美国军方开始使用直升机从战场上撤离伤员。不久后，以MAST为代表的美国政府主导项目开始使用军/民直升机在美国境内提供空中医疗救援服务（AMS）。

此后，空中医疗救援服务便驶入了发展的快车道。时间来到上世纪80年代，直升机快速进入民用市场并快速发展，这一趋势一直持续到今天。

如今，共有超过1200架紧急医疗救援直升机在美国境内运营，约相当于每一架紧急医疗救援直升机服务于267000位美国公民。

根据美国的比例计算，中国理论上需要5243架紧急医疗救援直升机。但是，如今中国仅有不到100架紧急医疗救援直升机正在运营，对于14亿人口的世界第一人口大国而言，中国的直升机数量存在巨大缺口。

空中医疗救援服务之所以如此重要，其原因非常简单，因为它能有效地提高医疗救援的救治成功率、降低病人的死亡率。时间，对于病人而言就是生命。综合各类统计数据，与传统地面交通运输解决方案相比，使用直升机进行医疗转运

救援，病人的死亡率下降35%~55%。

遗憾的是，2016年，中国约有260000人死于意外交通事故，如果我们拥有成熟的空中医疗救援网络，很多悲痛的事故或许能够得到扭转。

不过令人感到振奋的是，建设高效的空中医疗救援网络已经得到了中国政府的肯定，习近平在十九大会议报告上指出：“增进民生福祉是发展的根本目的。”

贝尔正积极配合中国的高层建设，我们正在向包括陕直股份在内的中国客户交付先进的直升机产品从而推动空中医疗救援网络的建设。陕直股份早前订购了100架贝尔直升机并致力于建设覆盖中国的空中医疗救援网络。

不仅如此，贝尔还同中国政府、行业协会、运营商等机构和企业紧密合作，共同探讨如何快速建立安全、可靠、高效且绿色环保的空中医疗救援网络。

我们将毫无保留的将贝尔超过80年的专业航空经验分享到中国，促进中国公共事业发展建设。☆ACP



## Improved Weather Forecasts Reduce Flight Delays and Increase Airspace Capacity

By I. M. Systems Group, Inc.

Chinese airline flights have increased each year since Reform and Opening Up in the late 1970s. Both business and leisure travel are booming. However, flight delays and cancellations have become a growing problem, felt nowadays by more passengers in China's busy airspace. As a result, frustrated travelers switched to the more punctual high-speed trains for intercity travel (e.g. Beijing - Shanghai). CAAC ATMB is working hard to ease flight delays, especially during the summer thunderstorm season when most massive delays occur. But it's not a simple problem in the context of keeping safety first with an annual air traffic growth rate over 10% for the last 15 years.

Efforts are ongoing in many areas. One bright spot is improved weather forecasts and their effective use in managing delays. For decades, operational aviation weather forecasts in China include ICAO-required terminal aerodrome forecasts (TAFs) and en-route significant weather forecasts. Besides these basic products, additional forecasts such as airport and area weather warnings, as well as other specific products are provided per user requests. Although operational Air Traffic Management (ATM) and airlines rely on these as useful guidance in general, the accuracy of these products beyond 2 hours has not met the user's expectations (i.e. when, where, and how severe the weather impact will be). ATM and airlines used to disregard the forecasts, and "react" to current weather based on observations (e.g. from weather radar, satellite, and other ground sensors). This method is very inefficient with the current high air traffic volume and limited civil airspace. (The latter is especially true in eastern China.)

When experts from the FAA Air Traffic Control System Command

Center (ATCSCC) heard their Chinese counterparts could not trust the forecast beyond 2 hours, they said they could not do their job with forecasts only 2 hours ahead. In fact, high-volume air traffic operations require significantly longer forecasts to proactively manage (instead of passively react to) future traffic flow. FAA has access to world-class long term forecasts from U.S. National Oceanic and Atmospheric Administration (NOAA) / National Weather Service (NWS), and has experience in using the forecasts to estimate how much flight capacity will be lost when thunderstorms impact air routes and airports. For example, if the capacity of an airport is forecast to be reduced by 50% between 1 pm and 5 pm, then only 50% of the scheduled flights should be allowed to operate during those hours. Airlines know this through Collaborative Decision Making (CDM) with FAA, so they are well prepared in advance. Otherwise there would be massive delays and congestion due to airborne holding and delayed departures. In the worst case, many planes already in the air would have to divert to other airports before running out of fuel, and planes on the ground would have to remain on the ground with passengers inside for many hours, not knowing if or when they could take off (resulting in a "gridlock" situation).

The FAA ATCSCC has an Air Traffic Flow Management (ATFM) procedure with US airlines and other users to ensure that in the above case (1) only 50% of the flights are allowed to operate during the thunderstorm period and (2) passengers whose flights are postponed or canceled are informed in advance – before going to the airport. Moreover, affected flights have enough time to prepare for recovery once the weather impact is over. So when the thunderstorms are forecasted to clear up 4 hours later, flights

departing from airports 4 hours away can be cleared to depart.

The U.S.-China Aviation Cooperation Program (ACP), which includes FAA, began working with CAAC ATMB to help improve the Chinese aviation system. It was clear from the beginning that the FAA system could not be directly copied in China, due to the Chinese ATM system's unique characteristics. For example, China has much less civil airspace than the U.S., so more accurate long-range weather forecasts are needed. Any effective solution had to be customized by considering all differences. On the other hand, lessons learned by the U.S. system could serve as a reference for ATMB to develop the new Chinese system much faster. ATMB and ACP began cooperation in many different areas to help find solutions. One of these areas is the use of improved aviation weather forecasting.


IMSG, the ACP member company that is prime contractor to the U.S. NWS, was chosen by CAAC Headquarters and ACP to work with East China ATMB on a USTDA-funded program called QWIPP (Quantifying Weather Impact to Airspace Capacity Pilot Project). IMSG has long experience as a world-class weather forecasting science and technology company and had already developed a system called Enterprise Integrated Aviation Weather System (eIAWS®) to bring the benefits of better aviation weather forecasts to developing countries.

Prior to the QWIPP, IMSG implemented a customized version of eIAWS® at East China ATMB, which for the first time enabled the agency to deliver operational high resolution numerical model-based aviation weather forecasts up to 12 hours ahead. Additional efforts by East China ATMB in improving the decision making mechanism and enhancing the weather forecast system platforms provided a strong foundation for the QWIPP collaboration. The QWIPP project goal was to demonstrate Decision Support Tools (DSTs) to help human air traffic managers know how much a given forecast would cut capacity on air routes, intersections (waypoints), ATC sectors, and airports. For example, if capacity would decrease by 40% between 2 pm and 5 pm, then air traffic managers would have enough lead time to coordinate with airlines who would

have to decrease the number of flights operating during that time by 40%. Passengers would be notified well in advance of postponed flight times or cancellations. This is critical to effectively cutting flight delays, diversions, and cancellations. It also allows for fast operational recovery by clearing more flights to depart earlier, so as to arrive shortly after bad weather is forecasted to clear.

IMSG had an advantage in working with East China ATMB because Project Manager Dr. Le Jiang is a Chinese-born U.S. citizen who worked for CAAC Beijing Meteorological Center (in North China ATMB) in 1990s. His team has many Chinese speaking PhDs. So communication and collaboration with East China ATMB were very frequent and direct in many meetings, workshops, and WeChat messaging. The U.S. team could quickly understand why many U.S. methods would not work in the Chinese system and could help find a way that worked. The QWIPP work got close collaboration from East China ATMB Weather, ATC, and ATFM teams, as well as from China Eastern, Spring, and Juneyao Airlines. It is also benefited from the assistance from FAA, NOAA/Earth System Research Lab (ESRL), six U.S. airlines (UA, Delta, AA, FedEx, Atlas/Polar Air Cargo, UPS) and U.S. companies Boeing, Honeywell, and L&B.

The DST concept developed by QWIPP uses East China airspace setting, flight separation rules, enhancements already made by EC ATMB, and eIAWS® weather information to estimate the available capacities for air routes, waypoints, and sectors when thunderstorm severity passes the threshold. The user display is updated hourly and forecasts 12 hours ahead, giving air traffic flow managers vividly updated graphic alerts for strategically planning traffic flow and tactically making adjustments.

With the success of QWIPP, East China ATMB started planning its roadmap for regional implementation of the new capabilities. Also, CAAC ATMB Headquarters expressed a strong interest in extending the benefits of QWIPP to the national level, as it moves from a collection of heterogeneous Regional ATFM systems to a new unified National ATFM system. 

## 提高天气预报以减少航班延误并增加空域容量

撰稿：IMSG公司

自上世纪70年代末改革开放以来，中国航空公司的航班每年都在增加。商务和休闲旅行都在蓬勃发展。然而，更多的乘客感受到现在中国繁忙的空域中航班延误和取消已成为一个越来越大的问题。结果，沮丧的旅客转向更加准时的高铁进行城际旅行（如北京-上海）。民航局空管局正在努力缓解航班延误，特别是在多数大面积延误发生的夏天雷雨季节。但这不是一个简单的问题，特别是在过去15年平均每年空中交通量增长超过10%而首先要保证飞行安全的背景下。

许多方面都进行了努力。一个亮点是通过提高天气预报和对它的有效使用来管理延误。几十年来，中国的业务航空天气预报包括了国际民航组织（ICAO）所要求的终端机场预报（TAF）和航路重要天气预报。此外，其它如机场和区域预警也按用户的需求予以提供。虽然空管和航空公司依赖于这些天气产品作为有用的指导，但是它们在2小时后的准确性还达不到用户的期望（何时、何地、天气影响有多严重）。空管和航空公司常常无法使用这些预报，只能“反应”式地应对目前（通过天气雷达、卫星、和其它地面传感器）观测到的天气。在目前的

大空中交通流量和有限民用空域的条件下，这样的方法非常低效。（这种情况在中国东部尤其突出）。

当美国联邦航空局（FAA）空管系统指挥中心(ATCSCC)的专家们听到中国的同行们信不过时效超过2小时的预报，美方说如果只有提前2小时的预报他们自己将无法执行工作。事实上，大流量的业务运营要求更长时间效的预报以积极主动（而不是消极反应式）地管理未来交通流量。FAA可以从美国国家海洋和大气管理局（NOAA）/国家天气局（NWS）获得世界水平的长期预报，并且具有使用这些预报来估计当雷雨影响航线和机场时飞行容量将损失多少的经验。例如，如果预计机场的容量在下午1到5点之间减少50%，那么在这些时间内只允许50%的原计划航班运营。航空公司通过与FAA的协同决策（CDM）了解这样的信息，因此他们可以提前做好准备。否则，由于空中盘旋和延迟离场，将会出现大面积延误和拥堵。最坏的情况是，许多已经在空中的飞机在燃料耗尽之前必须备降到其他机场，而地面上的飞机必须留在地上，乘客在里面停留数小时，不知道他们是否可以或何时起飞（结果是“僵局”）。

上述情况如果在美国，FAA空管系统指挥中心和航空公司及其它用户之间有一个流量管理程序，以确保（1）只有50%的航班在雷雨影响期间运行；（2）航班延误或取消的乘客将在他们前往机场之前被通知。此外，受影响的航班有足够的时间准备在预计天气影响过去之后迅速恢复。所以当预计雷雨在4小时后消散时，从4个飞行小时以上机场起飞的航班可以被放行。

包括FAA在内的美中航空合作项目（ACP）开始与民航局空管局合作，帮助改善中国民航系统。由于中国空管系统的特性，从一开始就很清楚FAA系统无法在中国直接复制。例如，中国的民用空域比美国少得多，因此需要更准确的长期天气预报。定制任何有效的解决方案都必须考虑所有差异。另一方面，美国系统的经验教训可以为空管局更快地发展中国的新系统提供参考。空管局和ACP开始在许多不同领域开展合作，以帮助找到解决方案。其中一个领域是使用改进的航空天气预报。

IMSG公司，作为ACP成员公司同时又是美国NWS的主承包商，被中国民航总局和ACP选中，与华东空管局合作完成美国贸发署资助的QWIPP项目（即量化天气对空域容量影响试点项目）。IMSG作为世界级天气预报科技公司，拥有丰富的经验，并且已经开发了一套企业级集成航空天气系统（名为eIAWS®），以为发展中国家带来更好的航空天气预报。

在QWIPP项目之前，IMSG在华东空管局实施了一套定制版的eIAWS®，使该机构首次业务化地提供基于高分辨率数值模式的航空天气预报，时效达12小时。华东空管局在改进决策机制和增强天气预报系统平台方面进行的大量其它努力也为QWIPP的合作提供了强大的基础。QWIPP的目标展示决策支持工具（DST），以帮助空管人员了解一个给定的天气预报将使航路、交叉点（即航路点）、空管扇区、和机场的容量下降多少。例如，如果预报容量在下午2到5点之间减少40%，那么空管人员将有足够的时间与航空公司协调，而这些航空公司必须减少40%计划在此期间运营的航班，并提前通知旅客们推迟的起飞时间或航班取消。这是有效减少航班延误、备降、和取消的关键做法。这样做还有助于快速恢复运行，如在（好天气的）起飞机场更早的放飞，在（坏天气的）降落机场天气影响刚刚过去后正好到达。

IMSG在与华东空管局合作方面具有优势，因为项目经理蒋乐博士是在中国出生的美国公民，曾于1990年代在中国民航北京气象中心（华北空管局）工作。他的团队有许多说汉语的博士。因此，在许多会议、研讨会和微信消息传递中，沟通和协调十分频繁和直接。美方团队可以很快理解为什么许多美国方法在中国系统中不起作用，并且可以帮助找到一种有效的方法。QWIPP工作得到了华东空管局气象、空管、和流量管理团队的密切合作，以及中国东方、春秋、和吉祥航空公司的协作，并且得益于FAA、NOAA/地球系统研究实验室（ESRL），六家美国航空公司（UA, Delta, AA, Fedex, Atlas / Polar Air Cargo, UPS）以及波音、霍尼韦尔、和兰德隆布朗公司的帮助。

QWIPP开发的DST概念使用华东空域设置、飞行间隔规则、华东空管局已有的改进、和eIAWS®生成的天气信息来预估雷暴超过阈值时航路、航路点、和扇区的可用容量。用户显示每小时更新一次，每次预报12小时，为流量管理人员提供生动和更新的图形警报，以便有效地战略性计划交通流量并进行战术调整。

随着QWIPP的成功，华东空管局开始规划其区域对此新能力实施的路线图。同时，民航局空管局总部表达了对将QWIPP的好处扩展到国家层面的强烈兴趣，因为其正在实施从不同种类的区域级流量管理系统向新的统一的国家级流量管理系统的迈进。





# AIRPORT BENCHMARKING – AN EFFECTIVE STRATEGIC INITIATIVE?

By Strategic Planning Services (SPS)

**B**enchmarking is commonly defined as the practice of strategic management that allows an organization to evaluate plans, set goals and measure productivity based on best industry practices by examining other facilities and operations. As airport owners throughout China work to meet unprecedented demand for aviation growth, many leaders seek to exchange ideas with other global airports and airlines to confirm their plans before embarking on a major new airport development project.


There can be value in understanding the good and bad lessons learned from other airports that may have similar characteristics with a new airport project, in terms of the volume of demand, the role of the airport as major hub or an origin/destination airport, or even the physical layout of the runway configuration and terminals. However, there is also a risk in assuming that a facility or operation that appears similar may not be a good model for comparison. As such, a successful benchmarking exercise requires a comprehensive understanding of both the airport in question, and the benchmark airport.

SPS was recently invited to participate in the Beijing Daxing International Airport Technical Workshop, where specialists from CAAC, ATMB and Beijing Daxing International Airport met with the FAA, U.S. Airlines and ACP member companies to share ideas and observations about the new Beijing Daxing International Airport, scheduled for a soft opening in September 2019. The Beijing Daxing International Airport is unique for several reasons - it will have the first V-Shaped runway in China, and it will feature some of the latest thinking in airport ramp control operations, terminal functions, and airport sustainability. On the surface, U.S. experience has much to offer in guiding the successful start-up of this magnificent new airport.

As members of the U.S. team asked to share observations from similar airports in the U.S., SPS specialists discussed similar runway configurations, but were careful to acknowledge

differences in operating conditions that may not be applicable in China. Experience in the U.S. with converging approaches, missed approaches, and diverging departure headings, has evolved substantially over the past several decades using new technologies and procedures designed to enhance safety, efficiency, and pilot awareness. Similarly, procedures and policies for ensuring a high level of safety and efficiency on apron areas has also evolved to better serve the demands of larger aircraft, connecting passengers, and more customer-focused airline operations. Some of the most relevant lessons learned – both positive and negative – were discussed. When conducting a Benchmark Analysis, it is important to know the difference in operating conditions among the airports.

Experts from SPS in airfield, terminal, gate and airspace operations have been asked to perform benchmarking studies for many airports to share our experience from decades of development at some of the busiest airports in the U.S. and around the world. Because of our staff's global experience, including nearly twenty years helping airport owners throughout China, we understand which practices at other airports are relevant and which do not apply in China. Equally important, we know the extent to which many Chinese airports are now setting the standard for new airport development, and in fact, will soon be among the world's busiest. In the case of Beijing Daxing International Airport, this benchmarking effort was part of the Airport's operational readiness planning process to ensure a smooth and efficient opening.

The opportunity to conduct a benchmark assessment is most valuable when it encourages the sharing of best practices among global airports. It is evident that we have much to learn from one another and that together, we can bridge the distance between us to develop a safe and efficient global airport system. 



# 机场标杆管理 —— 一种有效的主动战略性措施？

撰稿：SPS公司

**标**杆管理通常被认为是一种可以通过评估分析类似机构和运营，评估自身发展规划、设立基于行业最先进的知识和经验的目标、衡量产出效果的战略管理行为。目前中国的机场管理者们正在致力于满足高速增长航空需求，许多领导者希望能在筹备新的机场发展规划之前与其他国际机场和航空公司交换信息，确认其相应的未来发展计划。

从具有相似特点的机场中为新机场发展项目汲取经验教训具有相当的价值，这些相似特点包括需求量、枢纽机场或者始发/终到机场的运行、甚至跑道和候机楼的布局等。但是，一个看起来相似的设备设施或者运行模式却不一定是最合适的对比学习对象。因此，成功的标杆管理要求管理者对于规划机场和标杆机场都具有深入的、全面的理解。

SPS 近期参与了北京大兴国际机场技术咨询座谈会。会中，来自CAAC, ATMB以及北京大兴国际机场的领导和专家与FAA, 美国多家航空公司以及ACP成员公司分享了对于北京大兴国际机场（计划于2019年9月初步投入使用）规划建设观察调研结果与相关建议。北京大兴国际机场是第一个具有V型跑道构型的中国机场，同时也应用了许多最新的机坪管控、候机楼运行以及机场可持续发展理念，这些特点使得北京大兴国际机场的建设具有特殊意义。美国方面可以为北京大兴国际机场的成功开航运行提供诸多理论和技术上的支持和协助。

作为美国团队成员，SPS负责分享具有北京大兴国际机场相似特征的美国机场案例。会间，SPS 详细研讨了许多具有相似跑道构型的美国机场，同时在分享过程中也强调了中美两国不同的运行条件所造成的不可比性。在日新月异的科技以及不断完善的先进运行程序的帮助下，美国近年来在汇聚型进近、复飞程序、以及离散型起飞模式的运行安全、效率以及飞行员警觉性等方面一直在不断进化。与跑道运行类似，包括能够更好的服务大型飞机和中转联程旅客，以及注重旅客服务水平的航空公司运行模式的机坪管控程序也得到了进一步的发展，从而促进了高安全水准、高运行效率的站坪管理和运行。以上方面最



有相关性的正反面经验都在会间进行了分享讨论；如前所述，在进行标杆管理时充分了解自身与标杆机场运行条件的不同至关重要。

SPS在空侧、候机楼、机位以及空域方面的专家们具有数十年来参与美国以及世界范围内诸多繁忙机场的建设发展累积下来的经验，曾多次应邀为诸多机场提供标杆对比分析。因为我司团队具有全球范围的经验，同时也在近20年内持续帮助中国各大机场制定发展建设规划，我们十分清楚哪些其他机场的操作运营经验可以适用于中国机场。同等重要的是，我们也十分清楚眼下中国新机场的规划标准处于国际领先地位，这些机场会在短期内快速跻身世界最繁忙机场之列。在我司参与的本次北京大兴国际机场咨询中，标杆管理则是运行筹备规划中保障机场平稳有效开航的重要一环。

进行标杆评估最大的价值之一在于鼓励全球范围各大机场共享成功经验。我们相信机场之间可以通过相互学习、共同进步、消除彼此隔阂，共建一个安全、高效的全球机场系统。☆ACP

# SPS

# SPS

## STRATEGIC PLANNING SERVICES - TRANSPORTATION PLANNING & DEVELOPMENT

### Transportation Planning & Development

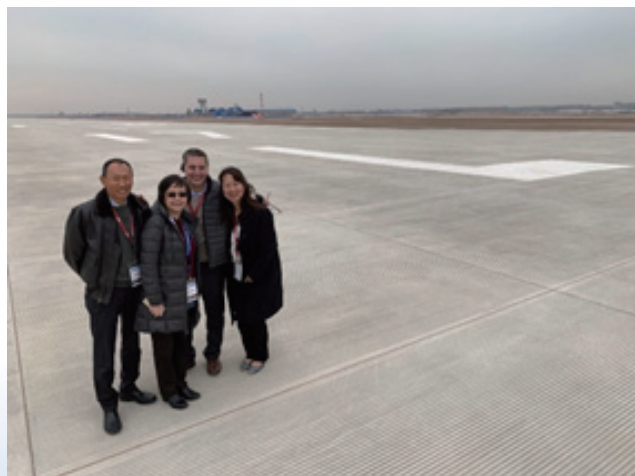
SPS offers expertise and strategic planning for large scale airport/aviation project development in international markets. Our leadership team of professional consultants share decades of collaboration providing strategic and technical guidance on the development and operations of major world airports, associated ground transportation and collateral development projects. Each key team member has performed roles for major clients that include strategic planning, international business strategies and conceptual architectural design to provide a perspective on complex projects that is both broad and deep. SPS services include

planning and conceptual design for all aspects of airport-related development, including airspace, airfields, passenger terminals/concourses, cargo facilities, landside ground access, support facilities and airport vicinity land use/collateral development (aerotropolis/airport city concepts). With offices in both the US and China, the total SPS staff can support each other in providing nearly a 24/7 work environment in which the sun never sets.

### SPS 战略规划服务 – 提供全方位运输规划和发展咨询服务

SPS为世界上大型项目发展提供专业规划服务和战略规划服务。公司领导团队成员拥有数十年的机场专业项目经验，为世界和中国主要机场的发展运行、地面交通及其周边商业开发建设等项目提供战略和技术咨询服务。每位主要团队成员拥有主要客户项目的规划咨询经验，包括战略规划、国际商业战略和概念性建筑设计咨询，具有复杂项目广泛而深入的专业经验和独到准确的分析视角。SPS公

司的服务涵盖了机场发展相关的规划和概念设计，包括空域、飞行区、旅客航站楼/指廊、货运设施、陆侧交通、配套设施和机场周边土地使用及相关发展（航空大都市/空港城概念）等。设立于美国和中国公司机构，确保各个员工能够相互支持工作，实现全天候、无时差的工作环境和模式。



## CIRIUM – THE NEW IDENTITY FOR A GLOBAL LEADER IN DATA ANALYTICS

Cirium is the new identity for the FlightGlobal data and analytics business which combines key databases and intelligence tools for the aviation and air travel industries.

The revamp will allow the organisation to communicate its breadth and depth of expertise to an increasingly diverse client base. A spree of acquisitions has seen the business more than quadruple in size in less than a decade.

The new name was chosen to deliberately steer clear of anything that locked the company into any sector. However, while it had to be “neutral”, Cirium has associations with being in the cloud, being at high altitude, and working with data sets in the cloud that are always changing. It is about bringing control to an industry that is constantly in motion.

### CIRIUM – 领先全球的数据分析新品牌名称

Cirium是FlightGlobal数据和分析业务的品牌新名称，整合了航空和航空旅行行业的关键数据库和资讯工具。

更改品牌名称能够让公司将广泛且精深专业知识传递给日益多样化的客户群。近年来，该公司经历了许多变化，整合了很多业务和资产。不到十年间，公司连番收购，企业规模翻了两番以上。

公司在选择新名字时特意避开了限定在某个行业领域的措辞。在满足中性词这一条件的同时，Cirium还有“位于云端之上，处于领先地位，且专注处理不断变化的云端数据集”的意思。公司旨在让客户掌握无时无刻变化不断的航空行业。

The business’s data and analytics group – including acquired businesses – FlightStats, Ascend, Diio and Innovata – and well-known products Ascend Values Analyzer, Diio Mi, Fleets Analyzer – come directly under the Cirium brand.

The reputation of some of these legacy brands is why several names will remain, not as brands but products within the Cirium portfolio. These include Diio Mi, a tool used by airlines and airports to analyse routes, and flightstats.com, the customer facing, real-time flight-tracking service, which has more than 7 million users. Meanwhile Ascend consultancy, which has been awarded “Appraiser of the Year” the seventh time this year, will continue to be used in connection with the Cirium brand in the fleet valuations sector.

数据和分析团队—包括收购的业务FlightStats、Ascend、Diio、Innovata和知名产品Ascend Values Analyzer、Diio Mi、Fleets Analyzer都直接纳入Cirium品牌。

声誉良好的传统品牌将继续保留，但不再作为独立品牌，而是Cirium旗下的产品，其中包括Diio Mi和flightstats.com。前者为航空公司和机场分析航线的工具，后者则面向客户提供实时航班跟踪服务，目前已拥有700多万用户。今年再度获颁“Appraiser of the Year”的知名咨询品牌航升(Ascend)将继续为Cirium的机队估值品牌。这已是航升第七次获得此殊荣。



# CIRIUM



## BELL 505 REACHES NEW LEVELS IN CHINA

In the helicopter world, Jet Ranger means powerful performance, extreme reliability, unrivalled efficiency and of course, fun! It's also the name of one of the most legendary and successful civilian helicopter families of all time. The newest version, the Bell 505 Jet Ranger X, made by Bell, continues to benefit from its cult following but promises more performance at an even lower operating cost and yes, that equals to even more fun. No wonder it continues to be a great success worldwide.

In China, Reignwood is the exclusive reseller of Bell 505s and the company is determined to develop the helicopter tourism industry with this aircraft in the coming years. They believe in the aircraft so much that they ordered 110 Bell 505s in 2017, so be prepared to see many Rangers taking over the skies in China.

The aircraft can seat up to 5 people including the pilot and is designed to meet a wide variety of missions but is particularly suited for helicopter tourism. Why? So there's the cost efficiency aspect of course, and pretty awesome performance, but most importantly, there

is no bad seat in this little aircraft. The elevated rear seats and full-glass cockpit provide panoramic views of the exterior, no matter where you are seated. And that's perfect for taking photos and selfies while you're sightseeing.

With a local presence in China spanning 40 years, Bell is continuing to increase training and services capabilities to support Chinese operators during the lifetime of aircraft ownership. So it's the right time to get in the tourism business with the Bell 505. A new Authorized Maintenance Center (AMC) and Authorized Delivery Center (ADC) at the Reignwood facility in Beijing will be ready to provide world class services to new Bell 505 operators.

"The Bell 505 Jet Ranger X builds on the success of the renowned Jet Ranger legacy in China," said Jacinto Monge, managing director for Bell North Asia. "We are excited that customers will now be able to experience the new Bell 505 Jet Ranger X and we are looking forward to seeing many more taking the skies as we continue to grow our footprint in China."

## 贝尔505在中国飞向新高

Jet Ranger——在直升机世界里，这一家族名称意味着强大的性能、极致的可靠、无与伦比的经济性以及非凡的乐趣（这点尤为重要！）。贝尔Jet Ranger或许是直升机史上最为传奇、最为成功的系列机型，而该家族的最新机型，贝尔505 Jet Ranger X在Jet Ranger家族的优势基础上，性能更进一步，运营成本更低，乐趣更多。毫无疑问，贝尔505 Jet Ranger X将延续Jet Ranger家族的巨大成功！

作为中国地区的贝尔505独家经销商，华彬集团于2017年订购了110架贝尔505并致力于在未来数年内利用这款先进的直升机布局低空旅游产业。

贝尔505 Jet Ranger X最多能够搭载包括飞行员在内的5名乘员。虽然能够胜任多种任务，但是旅游观光是它的拿手绝活。原因何在？答案是，贝尔505不但性能和经济性凸出，但最为重要的是，

得益于加高的后排座椅和宽大的舷窗，无论乘客坐在直升机的哪个座位上，都能享受到巨幕电影般的观景体验。

贝尔直升机已经在中国耕耘40年，公司正在加大中国地区的培训和售后支持服务力度并致力于为客户提供全生命周期的服务和保障。因此，当下可谓是利用贝尔505开展旅游业务的最佳时机。全新的贝尔505授权维护中心（AMC）现已在华彬天星北京基地正式开业，此外，这里还有贝尔505的授权交付中心（ADC），它们将为贝尔的中国客户提供世界水准的交付体验和售后保障服务。

"贝尔505 Jet Ranger X将续写贝尔Jet Ranger家族的传奇，我们非常激动这款先进的直升机已经开始交付中国客户，随着我们在中国进一步布局，我们期待在中国的蓝天上看到更多的贝尔直升机。" 贝尔北亚区董事总经理郝欣东（Jacinto Monge）说。





## INNOVATION DRIVES DELTA TO NEW HEIGHTS

In the highly competitive airline industry, it's differentiation that sets a company apart. Delta, a leading U.S.-based global airline, embraces that wisdom by leveraging breakthrough technologies and processes. A passion to innovate is driving better engagement with customers and redefining the customer experience to allow Delta to reach new industry heights.

For example, Delta is the only global airline to reduce air turbulence encounters as the number of severe weather events increase worldwide. This remarkable result is possible through the Delta proprietary Flight Weather Viewer App, a powerful tool launched in 2016 that enables pilots to see the invisible. In 2018, the App was upgraded to its 2.0 version with enhanced functionality.

Delta is also looking beyond the skies to streamline travelers' on-the-ground experience with innovations such as frontier biometrics technology. In December 2018, Delta partnered with U.S. Customs and Border Protection to unveil the US' first end-to-end biometric airport terminal in Atlanta. Facial recognition at each touch point – check-in, bag drop, security and boarding gate – allows customers to verify

identity with a look into a camera.

Delta's efforts in China, which is strategic to the airline's business blueprint, are amplified by its confidence in the market there. Opening the Shanghai-Atlanta route in 2018 and a proposed Shanghai-Minneapolis nonstop flight in 2020 are evidence of Delta's commitment amid the suspension of some China-U.S. flights by other U.S. carriers. Seat capacity increased 23% in 2018 with the Shanghai-Atlanta route and deployment of the flagship Airbus A350 on half of Delta's U.S.-China flights. In July 2019, Delta will introduce the first A330-900neo in Shanghai-Seattle route. The aircraft will be the first Delta widebody to feature the new wireless IFE system developed by Delta Flight Products, the airline's wholly owned cabin interior start up. The aircraft is also equipped with high-speed 2Ku internet connectivity and customers will have access to free mobile messaging while on board through iMessage, WhatsApp and Facebook Messenger.

The drive to keep climbing and the passion to innovate have brought Delta to where it is today and will continue to take the airline to new heights.

### 达美航空：创新驱动，不断超越



在竞争激烈的航空业，差异化战略使航企脱颖而出。总部位于美国的全球性航企达美航空正在拥抱这一理念，积极采用创新科技与创新流程，打造差异化优势。激情创新使达美与客户的沟通不断提升，客户体验也迈入全新的境界。达美正在不断树立行业新标杆。

举例来说，在全球范围恶劣天气事件增多的趋势下，达美是唯一一家遭遇气流影响越来越少的全球性航企。这一非凡成就归功于达美专有的“飞行天气查看器”（Flight Weather Viewer）应用程序。达美于2016年发布该应用程序，2018年推出增强功能的2.0升级版本。

达美在重新定义空中旅行体验的同时，还依靠生物识别等前沿科技的创新应用，不断提升地面旅行体验。2018年12月，达美与美国海关和边境保护局合作，在亚特兰大机场推出全美首个全程部署生物识别技术的航站楼。从进入航站楼直至登机的每道关卡，包括登机手续办理、行李托运、安检、登机口，均部署人脸识别技术，乘客可选择通过摄像头确认身份，不必出示护照。

中国在达美的发展蓝图上具有战略意义，达美对中国市场充满信心，不断推进在华业务。在其他美国航企纷纷取消部分中美航线的形势下，达美逆势而为，在2018年开通上海至亚特兰大航线，并计划于2020年开启上海至明尼阿波利斯直飞航班，达美对中国市场的长期承诺可见一斑。2018年，达美因开通上海至亚特兰大航线，并在其一半的中美航线部署全新的旗舰客机空客A350，其中美航线的运力（航班座位总数量）比上一年增长了23%。

2019年7月1日，达美将在上海至西雅图航线首次启用A330-900neo客机。A330-900neo将是达美首个配备全新无线机载娱乐系统的宽体客机（该系统由达美航空全资拥有的机舱内饰创业公司Delta Flight Products开发）。A330-900neo还配备2Ku高速网络连接，乘客可在“云端”使用手机打开iMessage、WhatsApp和Facebook Messenger等应用程序，免费发送信息。

不断超越，激情创新，达美因此而成就了今天，也必将继续攀升到更美好的未来。



## GE AVIATION COMMITTED TO BOOSTING CHINA'S AVIATION INDUSTRY

In 1985, the CFM56-powered Boeing aircraft entered China, starting GE Aviation's operation in China. For more than 30 years, China's aviation industry has gathered momentum and maintained strong growth. It's a privilege for GE Aviation to play an active role in the progression of China's aviation through our products and services. Today, GE and its joint venture CFM International (50/50 JV of GE and Safran Aircraft Engines) have over 5,800 engines operating in Greater China, more than 4,000 engine backlog and serve more than 60 airline customers.

In addition, GE Aviation has been offering strong support for the major projects of China's aviation industry. Up to Feb. 2019, the 12th CF34-10A-powered ARJ21 aircraft was delivered smoothly. Our cooperation with COMAC is in full swing, dedicating to the test and certification of LEAP-powered C919.

Going forward, GE aviation will continue to leverage our outstanding technologies and services to bring extraordinary customer value on high reliability, high utilization, and controllable maintenance cost.

## GE航空集团全力助推中国航空业蓬勃发展

1985年以CFM56发动机为动力的波音飞机进入中国，开启了GE航空集团在华运营的篇章。30多年来，中国航空业保持了持续发展的良好势头。GE航空集团也有幸以我们的产品和服务积极参与、持续助力壮美的中国航空事业。目前，GE与其合资企业CFM国际公司（GE与赛峰飞机发动机的平股合资公司）在大中华区有5800多台在翼发动机，另外还有4000多台发动机订单，服务60多家航空公司客户。

此外，GE还全面支持中国航空工业的各大项目，截止今年2月，第12架以CF34-10A为动力的ARJ21飞机顺利交付；我们与商飞团队积极合作，全力推进以LEAP发动机为动力的C919国产大飞机的试飞取证。

我们将凭借出色的技术和服 务，不断为客户带来高可靠性、高使用率、可控维修成本的卓越价值。



## 湾流大中华区快讯

湾流最大的国际机队——亚太机队由南向北从新西兰覆盖至韩国，并向西跨越中国，远达巴基斯坦。目前，该机队的规模仍在不断壮大。截至2019年初，以亚太区为基地的湾流飞机达337架，约占全球现役湾流飞机总数的12%。

自2014年以来，亚太区湾流机队的规模已增长了近25%。本地区迄今面积最大、人口最多的中国拥有最多的湾流飞机数量，达122架。而包含中国内地、香港、台湾和澳门地区的大中华区则运营有209架湾流飞机。

大客舱飞机在亚太区湾流机队中占绝大多数，如Gulfstream G650ER、Gulfstream G650和Gulfstream G550，但该区域也拥有10架同级最佳的超中型飞机Gulfstream G280，及超过35架的G200和G150等小型湾流飞机。

湾流在亚太区为其运营商提供丰富的资源，包括于2012年11月投入运营的北京服务中心。至2018年底，湾流北京的技术人员已获中国民用航空局批准，可对Gulfstream G550和Gulfstream G450进行96个月定检，对Gulfstream G280进行72个月定检，对Gulfstream G200进行144个月定检。

2018年4月，湾流的姊妹公司喷气航空（Jet Aviation）收购了霍克太平洋（Hawker Pacific）。之后，霍克太平洋设于上海虹桥国际机场的服务中心于2018年底成为湾流授权保修基地。该基地距上海市中心大约8英里（12.9公里）。

在人事方面，湾流亚太团队新引入了一位重量级成员——Ernest Tai。Tai常驻香港，最近被任命为客户支持总经理。作为业界资

深人士，Tai负责接洽区域内的客户，并与湾流、喷气航空和霍克太平洋协同为客户提供支持。喷气航空在香港和新加坡的维修基地均为湾流授权维修中心，是对湾流北京服务能力的重要补充。喷气航空在新加坡的维修中心拥有面积超过200,000平方英尺（18,581平方米）的维修机库和支持空间，可对注册于中国内地、香港地区、澳大利亚、马来西亚、菲律宾及美国和其他国家的湾流最受欢迎机型进行大修，包括G650、G650ER、G550和G450。其香港维修中心的技术人员也能对注册于中国内地、香港地区及美国和其他国家的湾流大客舱飞机进行维修。

对亚太区湾流飞机运营商而言，香港拥有非常宝贵的资源——亚洲客户支持与联络中心。该中心位于香港国际机场附近，工作人员包括一位计算机维修计划分析师、一位技术系统专家、一位零部件现场销售与保修专家、一位客户支持部区域销售经理及一位航材经理。

香港拥有60多架湾流飞机，不仅是本地区最大的湾流飞机聚集地，同时也拥有湾流授权保修基地美捷（Metrojet）。美捷可为注册于中国和香港地区的湾流飞机提供支持。

此外，设于悉尼和墨尔本的ExecuJet，及设于孟买的Airworks湾流授权保修基地也可为亚太区的客户提供更多支持。

由于亚太区湾流机队规模庞大，因此湾流不断为该地区派驻更多的现场服务代表（FSR）。

目前该地区的FSR包括：香港4名；中国2名；日本、新加坡、澳大利亚和印度各1名。



## IAAC LEADER IN WORLDWIDE AVIATION CONSULTING

### IAAC: 国际机场与空管咨询

Procedures, Training, Designing, Safety Evaluations, Environment Mitigations, and Fuel Savings.

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Current projects in China, Middle East, United States, New Zealand and Brazil

IAAC is proud member of US-China Aviation Cooperation Program since 2012

IAAC是全球航空咨询的领导者。我们与客户合作开发，交付和管理机场，航空公司和空中交通解决方案和计划，以促进航空业的安全，可靠和可持续发展。我们的航空专家团队专注于结合中国和全球的航空程序。

所有程序的设计都符合国际民航组织的标准。我们使用NextGen工具创建安全和操作程序的协调平衡。



Assisting Beijing Daxing International Airport (BDIA) with final refinements for the grand opening this year

IAAC制定程序来加强您的航空业务，以提高安全性，效率和减少碳排放。我们团队的成员是获奖的区域导航（RNAV / RNP）开发人员。我们的专长包括机场运营认证，绿色项目，机场程序，航空燃油节约/运营计划，空中交通管制培训，流量控制和安全管理系统（SMS）。

### 机场

- 协同决策
- 飞机救援和灭火
- 机场认证手册
- 除冰和环境
- 机场应急计划
- 斜塔
- 标准的经营准则
- 雪和冰控制程序
- 设备管理系统
- 机场训练程序
- 事故指挥系统
- 闸门管理系统
- 机场碳中立
- 第 139 部分地理信息系统检查
- 不规则的操作
- 地表移动指导控制
- 野生动物危害管理计划
- 机场安全

### 航空公司

- 减少碳排放量
- 燃油效率的计划
- 航空公司的效率电脑
- 航空公司不正常操作
- 安全管理系统
- NextGen 增强功能
- 基于性能的导航
- 飞行员训练
- 关于电话顾问

### 空中交通管制

- 空管培训
- ATC NextGen
- 程序开发
- 流量控制
- 紧急程序
- 不规则的操作
- 安全管理系统
- 入口匝道控制
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- 性能增强导航
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## ITW GSE, IDEAL SOLUTION FOR GREEN AVIATION

With the Civil Aviation Authority of China (CAAC) September 2018 implementation of a “3-year Action Plan to win the blue sky defense war”, it is clear that China wants to go green by shutting down APU operations and switching over to electrically powered Ground Power Units (GPU) and Pre-Conditioned Air (PCA) for parked aircraft.

Positioned as the 9th busiest airport in the world and 2nd in China, Shanghai Pudong International Airport has chosen ITW GSE to power parked aircraft in their new Satellite Terminal with 153 units of solid state “2400 Power Coil”. This innovative GPU includes a 400 Hz, 90 kVA power converter and a cable coil in one single enclosure.

Guangzhou Baiyun International Airport (CAN) has also chosen ITW GSE to cool parked aircraft for the comfort of passengers with 7 units of the ITW GSE “3400 PCA”. These fully modular and most energy efficient PCA equipment in the industry have been in successful operation since Sep 2018. To date, ITW GSE has also supplied over 1,100 GPU in China, of which close to 100 units are in operation in CAN.

As the global market leader in our industry, ITW GSE has also unveiled the groundbreaking mobile “7400 battery GPU”, which is ideal for gates without fixed 400 Hz and remote parking stands which does not have the required input power supply infrastructure. Besides great operational flexibility, the 7400 GPU has zero emissions in the airport and even greater reliability as compared with conventional engine driven GPU. It is also an ideal solution for CAAC’s “3-year Action Plan to win the blue sky defense war”.

### ITW GSE 助力绿色民航

随着中国民用航空管理局在2018年9月提出的关于“三年行动计划打赢蓝天保卫战”的实施，中国显然希望通过关闭APU操作、转而使用电动的地面电源(GPU)和飞机地面空调(PCA)来实现绿色环保。

作为世界第九大机场、中国第二大机场，上海浦东国际机场已选用ITW GSE的153台“2400静变电源一体机”为其新卫星航站楼停靠的飞机提供地面电源。这种创新的GPU是由一个400Hz, 90kVA的电源转换器和一个电缆收放装置集成一体组成的。

为了提升乘客的舒适度，广州白云国际机场(CAN)也选择了7台 ITW GSE “3400 PCA”。这些全模块化，且行业中最节能的PCA设备自2018年9月已成功投入使用。到目前为止，ITW GSE在中国已提供超过1,100台GPU，其中近100台在CAN机场运行。

作为行业的全球市场领导者，ITW GSE还推出了突破性的可移动式“7400蓄电式GPU”，非常适用于没有固定400Hz的廊桥或不具备所需输入电源基础设施的远程停机位。除了极佳的操作灵活性，7400 GPU在机场带来零排放，与传统发动机驱动的GPU相比，具有更强的可靠性。对于中国民航局的“三年行动计划打赢蓝天保卫战”也是个理想的解决方案。



This shows the PCA 3400 in operation in Guangzhou Baiyun International Airport

左图为ITW3400飞机地面空调在广州白云机场运作。

This shows our groundbreaking 7400 Battery GPU operating in United Airline's hub in Los Angeles International Airport

右图为美联航在其枢纽机场洛杉矶国际机场使用ITW7400蓄电式GPU。



This shows 2 out of 153 units of 2400 Power Coil that have been installed in the New Pudong Satellite Terminal

ITW在上海浦东国际机场新卫星航站楼配备的153台ITW 2400静变电源一体机中的2台。



Security &amp; Detection Systems



## L3'S CHECKPOINT OF THE FUTURE, HERE TODAY

Strong industry trends continue to show increasing global air passenger travel. China is the second largest aviation market in the world but on target to become the biggest by 2022. The nation's economic prosperity brings an expanding upper-middle class, and airports will want to maintain high levels of service and satisfaction expected by passengers.

This will include plans to improve and expand the latest in security technologies, enabling passengers to proceed through security quickly and efficiently, with minimal inconvenience. L3's checkpoint of the future is a modular solution perfect for the growing China market. In the new smart airport environment, a key focus is deploying next-generation computed tomography (CT) technology at the checkpoint, networked to provide remote viewing and shared data.

### L3 的未来安检站现已投入应用

强劲的行业趋势表明全球乘飞机出行的旅客量持续增长。中国是全球第二大航空市场，到 2022 年将成为全球最大的航空市场。中国的经济繁荣使中产阶级人数不断增加，机场希望保持高水平的服务以满足旅客的需求。

这将包括提升和扩展安全技术的计划，使旅客能够快速高效地通过安检，同时提供最大程度的便利性。L3 的未来安检站是一种模块化的解决方案，非常适合发展日新月异的中国市场。在全新的智慧机场环境中，部署联网的下一代计算机断层扫描 (CT) 技术，能够实现远程判读和数据共享，帮助机场实现智慧安检。

L3 的 ClearScan® 安检站 CT 扫描仪无论是 CT 的探测能力还是在机场的部署数量都处于世界领先地位。其多重探测算法和辅助硬件在主要的国际机场已扫描超过 1000 万件行李。将 ClearScan 与 L3 的创新型自动托盘处理系统 Mach-SmartLane® 结合之后，机场能够将现有安检站的通过效率提升一倍。L3 的 ProVision SV 是专为中国市场设计的人身安检系统。

作为值得信赖的合作伙伴，L3 始终处于业界领先地位，能够满足最苛刻的客户需求 and 法规要求。L3 提供的安全、可扩展、可联网的解决方案，是能够让全球航空公司、机场和旅客受益的杰出投资。

L3's ClearScan® checkpoint CT scanner is the global leader in CT detection and airport deployments. Its multiple detection algorithms and auxiliary hardware have scanned more than 10 million bags at major international airports. Airports have been able to double their checkpoint throughput when ClearScan is coupled with L3's Mach-SmartLane®, an innovative, automated tray handling system. L3's ProVision SV is a people screener designed for the China market.

As a trusted partner of choice, and always on the leading edge, L3 meets the most demanding customer expectations and regulatory requirements. L3 solutions are secure, scalable and networked – an outstanding investment that benefits airlines, airports and passengers worldwide.



# TEXTRON



赛斯纳奖状系列飞机荣登2018年公务机交付量榜首，  
奖状680A纬度蝉联全球最畅销中型公务机

## CESSNA CITATIONS LEAD THE INDUSTRY IN 2018 DELIVERIES; CITATION LATITUDE RECOGNIZED AS MOST DELIVERED MIDSIZE BUSINESS JET

WICHITA, Kan. (Feb. 20, 2019) – Textron Aviation Inc., a Textron, Inc. (NYSE: TXT) company, announced that its Citation aircraft were the most-delivered business jets of 2018 according to the annual shipment and billings report published by the General Aviation Manufacturers Association (GAMA). Textron Aviation delivered 188 business jets – including 57 Cessna Citation Latitude aircraft – winning the midsize segment for the third consecutive year and outselling its closest competitor four to one.

“Leading business jet deliveries in 2018 is a continued testament to the trust our valued customers place in the Citation family,” said Rob Scholl, senior vice president, Sales and Marketing. “We’re honored to see that customers and operators have responded by making the Latitude their midsize platform of choice for three years running.”

Recognized for its mission flexibility and low operating costs,

美国堪萨斯州威奇托市（2019年2月20日）——德事隆集团（纽交所代码：TXT）旗下德事隆航空宣布，根据通用航空制造商协会（GAMA）发布的年度交付与销售额报告，公司旗下奖状系列飞机荣登2018年全球公务机交付量榜首。2018年，德事隆航空共交付了188架公务机，其中包括57架赛斯纳奖状680A纬度飞机，该机型已连续第三年蝉联中型公务机市场销量冠军，并以交付量四比一的巨大优势远超竞争对手。

“奖状系列飞机在2018年位居公务机交付量首位，再一次证明了我们尊贵的客户对奖状家族的信赖。”德事隆航空销售与市场高级副总裁Rob Scholl表示：“我们非常荣幸能够获得客户与运营商的青睐，连续三年来将奖状680A纬度作为他们的中型公务机首选。”

the Citation Latitude has grown in popularity with operators worldwide. In 2018, the midsize jet earned certification in Australia and China and today, the aircraft is certified in 43 countries. The worldwide fleet has amassed more than 150,000 flight hours since entering service in 2015.

The jet’s class-leading takeoff field length of 3,580 feet provides greater access to airfields usually reserved for smaller aircraft, allowing operators to land closer to their final destinations. Inside, the Latitude’s flat floor cabin delivers a new level of comfort to the midsize segment, and features like Bluetooth connectivity and a custom wireless cabin management system give passengers cabin control from their personal devices.

奖状680A纬度公务机凭借其执飞多任务的灵活性以及低运营成本广受好评，备受全球运营商的喜爱。2018年，这款中型公务机在澳大利亚和中国取得认证。如今，该机型已在43个国家获得认证，自2015年投入运营以来，全球机队已累计超过150000飞行小时。

奖状680A纬度的起飞滑跑距离为1091米（3580英尺），领先于同级别机型，可以在小型机场起降，方便运营商进出其最终目的地。奖状680A纬度的客舱拥有平坦地板，为中型公务机市场的客舱舒适度树立了新标杆。通过蓝牙连接、定制化无线客舱管理系统等功能，乘客可通过其个人电子设备进行客舱控制。



## UPS – THE POWERFUL LOGISTICS PARTNER OF CHINESE ENTERPRISES

Founded in 1907 and headquartered in Atlanta, Georgia, UPS is a global leader in logistics and has its presence in over 220 countries and regions with 454,000 employees. In 2018, its turnover has reached 72 billion dollars.

UPS entered the China market in 1988, providing solutions for customers in multiple industries, helping promote the connectivity between the Chinese market and the global market. Today, UPS provides international services across more than 330 commercial centers and cities connecting Chinese customers with destinations in U.S.A., Europe and Asia with 200 flights per week. UPS upsized to new Boeing 747-8 aircraft, which offer 15 percent greater capacity than previous Boeing 747-400s.

UPS has established the International Hub in Shanghai and Asia Pacific Hub in Shenzhen, becoming the first international express carrier that has two international hubs in mainland China. The improved transport internet has guaranteed the convenient and controllable service for Chinese customers, and ensured UPS a more competitive market place. UPS has always been focusing on upgrading the services, so as to provide more advanced, flexible and accurate customized logistics solutions for

China's manufacturing companies from different segmented markets, allows them can pay more attention to their own business, and helps them create more value.

In 2018, UPS announced new service enhancements across eight cities in China to provide export manufacturers with stronger connectivity to the global market. The improvements are part of UPS's multi-year plan for China. Customers in Zhongshan, Zhuhai, Jiangmen, Quanzhou, Jiaying, Wenzhou, Shaoxing, Nantong, and the surrounding areas of these eight cities were benefited from the improvements brought by enhancements impact. UPS has been sparing no effort to promote Chinese brands towards the world. Additionally, UPS My Choice® package-delivery management service was introduced to give Chinese consumers shopping from international e-tailers greater control over their deliveries.

During the past two decades, UPS has invested about USD 1 billion in technology every year. UPS smart logistics is about harnessing the huge amount of data available, to make intelligent decisions so that logistics becomes more efficient, secure and sustainable.

### UPS – 中国企业强有力的物流伙伴

UPS (United Parcel Service, Inc. 美国联合包裹运送服务公司) 成立于1907年, 总部设于美国佐治亚州亚特兰大市, 是全球领先的物流企业; 服务范围遍及全球220多个国家和地区, 拥有45.4万名员工。2018年UPS营业额达到720亿美元。

自1988年进入中国以来, UPS致力于为各类客户提供全方位的物流服务, 助力中国市场更好地与全球市场连接。现在, UPS在中国的服务范围覆盖330多个商业中心和主要城市, 每周连接中国和美国、欧洲以及亚洲其他国家和地区的航班达200个班次。为了增加运力满足空运需求, UPS部署了新型的波音747-8运输货机, 航空货运能力相比之前波音747-400s型运输货机提高15%。

UPS分别在上海与深圳建立上海国际转运中心和深圳亚太转运中心, 成为中国大陆最早一家拥有两个国际转运中心的国际快递承运商。完善的交通运输网络为中国客户提供无与伦比的运输便捷和可控性, 客户的商业竞争力随之提升。UPS为不同细分市场的

中国制造业企业持续提供更先进、更灵活、更精准的定制化物流解决方案, 让中国企业能够更加聚焦在业务本身, 携手客户创造更多价值。

2018年, UPS宣布在中国八个城市新增服务提升, 旨在帮助中国出口制造企业拓展全球市场。此举为UPS针对中国市场多年投资及增长计划的一部分, 此次的服务提升为中山、珠海、江门、泉州、嘉兴、温州、绍兴、南通八个城市及其周边区域的客户带来一系列的服务升级为中国品牌走向全球注入新的动力。此外, UPS拓展了My Choice®包裹递送管理服务规模, 提升了中国消费者在网上跨境购物的体验, 更好地掌控国际包裹的运输和递送环节。

在过去20年中, UPS每年在全球范围的科技研发投入约10亿美元, 并持续打造建设智慧物流科技, 凭借现有的庞大数据库, 做出更为明智的决策, 推动物流产业向更加安全、高效、可持续发展的方向。



## ELECTRIC AIRCRAFT PROPULSION – IS IT TIME?

Electric and hybrid electric aircraft propulsion is at the forefront of aerospace conversations. UTC is enthusiastic about the potential for electric propulsion and is advancing current technologies and developing new ones to address this emerging opportunity. Over the coming years, UTC will be investing significant resources to push new frontiers in power-dense generation and management solutions, including new product development, infrastructure, and capability.

Electric propulsion could be the key to unlocking new modes of aerial transport. It enables new aircraft architectures and can lead to new markets and lower operating costs. In turn, this can make flying more affordable and practical by reducing costs and complying with noise and emissions regulations.

Electric propulsion is in many ways the culmination of a more electric aircraft – over time, electrical systems have increased in power and efficiency. This allowed the continued progression from hydraulic and

pneumatic solutions to more electric secondary systems. It's now realistic to see the drive for electrification extend to primary aircraft propulsion. As the provider of the world's largest flying microgrid – the 1.5 MW Boeing 787 power management and distribution system – UTC has been developing many of the needed technologies to enable this electric propulsion revolution for years. United Technologies Research Center have been exploring new propulsion system architectures and developing underlying capabilities in power dense controllers and power converters. We have the unique ability to provide system solutions to enable the entire electric propulsion system.

As new business models emerge, the viability of electric and hybrid electric propulsion systems will emerge as well. The future of electric propulsion is up to the innovators and entrepreneurs, in both small and large companies. As a company built by innovators and entrepreneurs, we're looking forward to the future.

### 全电飞机推进系统——远在天边，近在眼前？

全电和混合电推进技术无疑是目前航空业热点之一。联合技术对电推进技术充满信心。除了持续推进对现有技术的升级创新，联合技术也致力于新技术的研发，积极拥抱新机会。未来几年，公司将继续推进高功率发电和管理方案，致力于将这些技术推向新的突破，大力投资新产品研发、相关基础设施和能力。

电推进技术会改变飞机传统架构、导向新的市场、降低运营成本。飞机噪音和污染物排放都会减少，出门乘坐飞机将成为一项经济实惠的选择。

随着电源系统的功率和效率不断提升，多电飞机最终将会逐步演变为电力推进。目前，以电力作为多电飞机二次能源的技术日趋成熟，并且正在越来越多地取代传统飞机系统中的液压能和气动能。现在我们有理由预见，电气化将逐步应用到飞机的主推进系统。

联合技术为波音787提供世界上最大的飞行微电网——1.5兆瓦的电源管理和配电系统。我们对电推进系统的各项关键技术已有多年的研发经验。

此外，联合技术研究中心也一直在探索新的推进系统架构，开发功率密度控制器和功率转换器的潜在能力。依靠强大的研发团队，联合技术在集成系统能力方面具有得天独厚的优势，推动全电推进系统的发展。

随着新商业模式的出现，全电和混合电推进系统的发展也将加速。电推进技术的未来取决于业内每一位创新者和企业家的努力，无论是行业巨头，还是创业公司。作为一家由全球多位最伟大的发明家所创立的公司，我们对未来充满期待。



# ACP Introduction

ACP was established in 2004 as a public-private partnership to help with China's aviation development. Working closely with the Civil Aviation Administration of China (CAAC), airlines, airports and other Chinese aviation stakeholders, ACP's assistance is directed toward the country's highest priority activities, involving safety, efficiency and capacity.

The history of aviation cooperation between the United States and China can be traced back to the 1970s, when our two nations began to reestablish diplomatic relations. Today, China's aviation sector is expanding rapidly to meet the needs of airline passengers and cargo transportation. This growth in both domestic and international aviation translates into the need for substantial increases in flights, passenger and cargo aircraft capacity, general aviation, air traffic management upgrades, and professional training — all of which constitutes a substantial market opportunity for US aviation companies.

ACP is Co-Chaired by John Bruns, President of Boeing China and Nicole Didyk Wells, Senior Representative North Asia of Federal Aviation Administration. Geoffrey Jackson is ACP's Executive Director. ACP and its 39 members receive considerable support from the Federal Aviation Administration (FAA), the United States Trade and Development Agency (USTDA), the Transportation Security Administration (TSA) and the U.S. Embassy in China.

ACP members choose to work in committees according to their member interests. Committees include: Airlines; Airports and Infrastructure; Air Traffic Management; Manufacturing and Airworthiness; General Aviation and Business Aviation; and Leadership and Professional Development.



## How to Join ACP

The application process for joining ACP is simple if your company and ACP both feel that both sides will benefit from membership. The annual membership fee for corporate members is RMB 62,000 (the US dollar equivalent is about \$9,400 as of January 2019). Membership is open to US based companies only. The acceptability of any applicant for membership in ACP is determined by the Leadership Committee.

To begin the process, please contact the ACP staff through telephone or email:

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