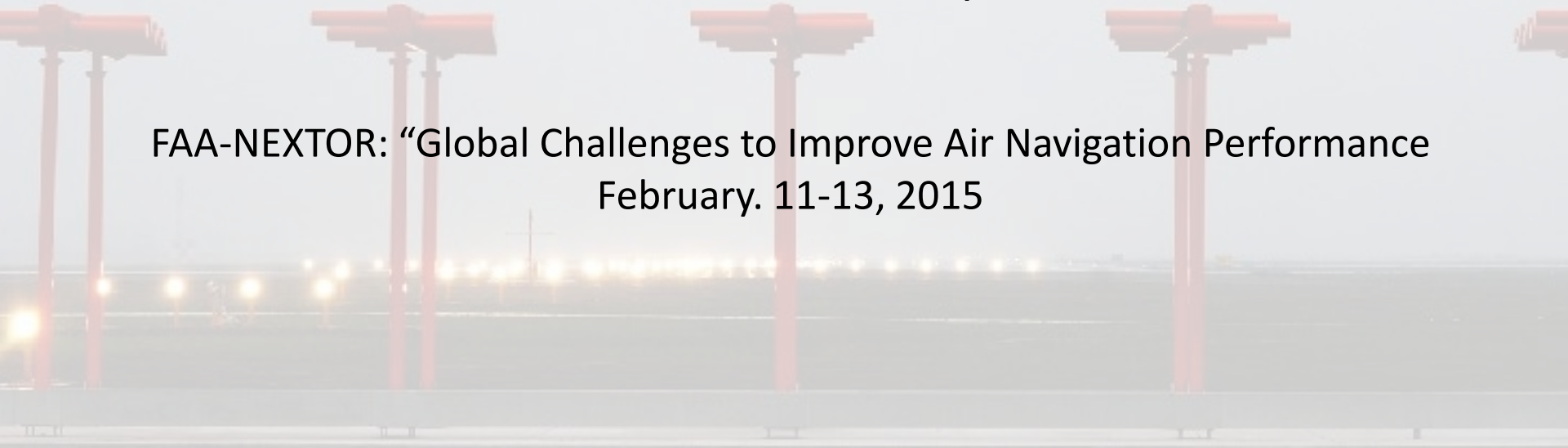




Aviation Growth in China: Challenges and On-going efforts

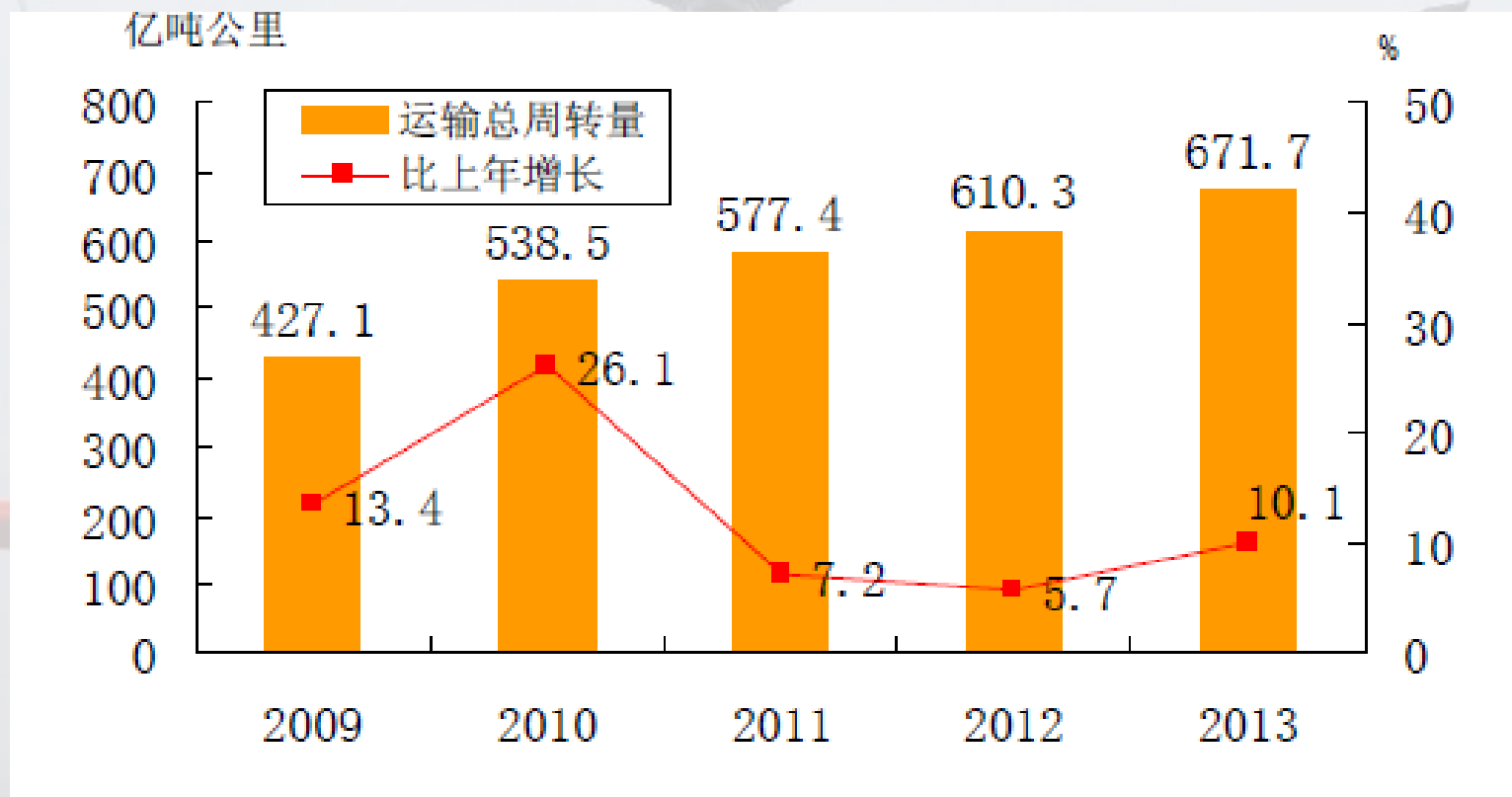
Yu Zhang, University of South Florida, USA

Yifei Zhao, Civil Aviation University of China, China



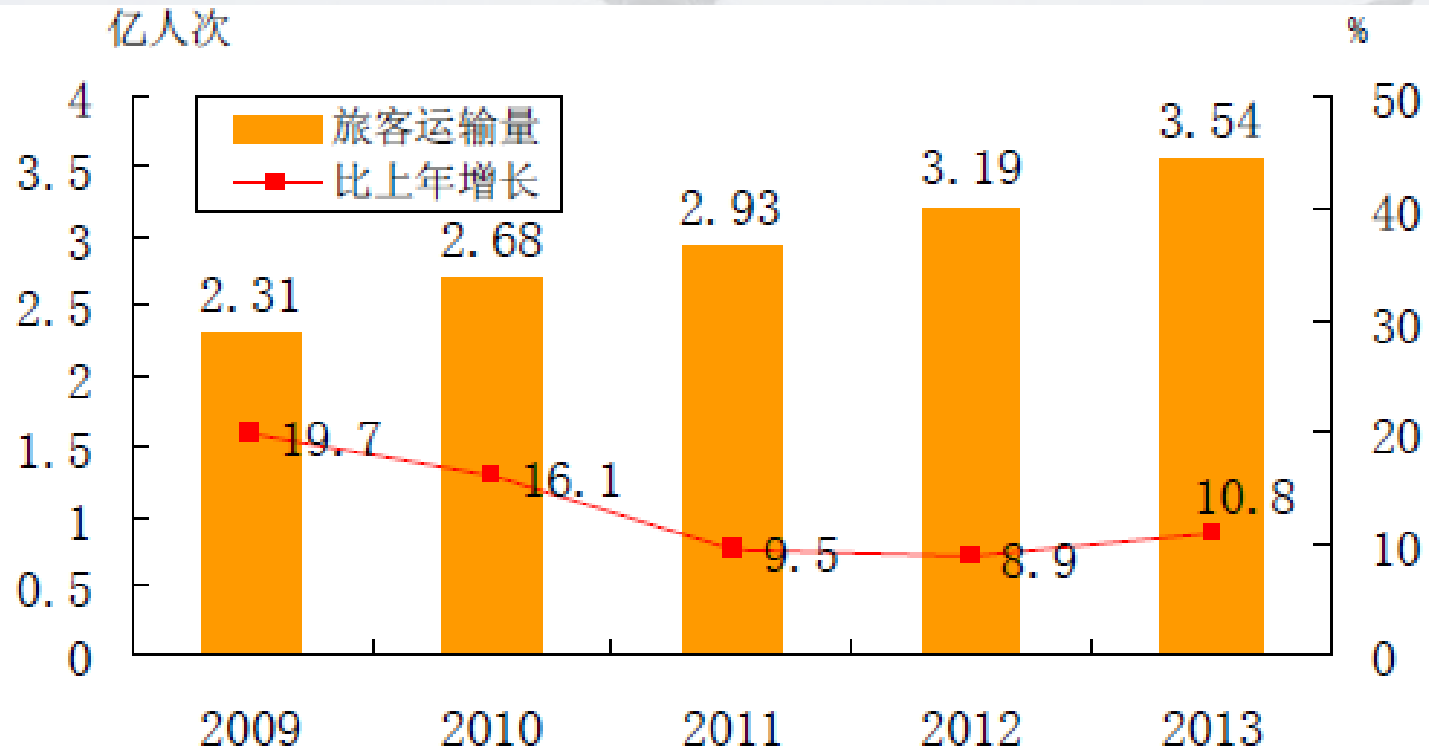
FAA-NEXTOR: “Global Challenges to Improve Air Navigation Performance
February. 11-13, 2015

Civil Aviation Transportation Turnover 2006-2013



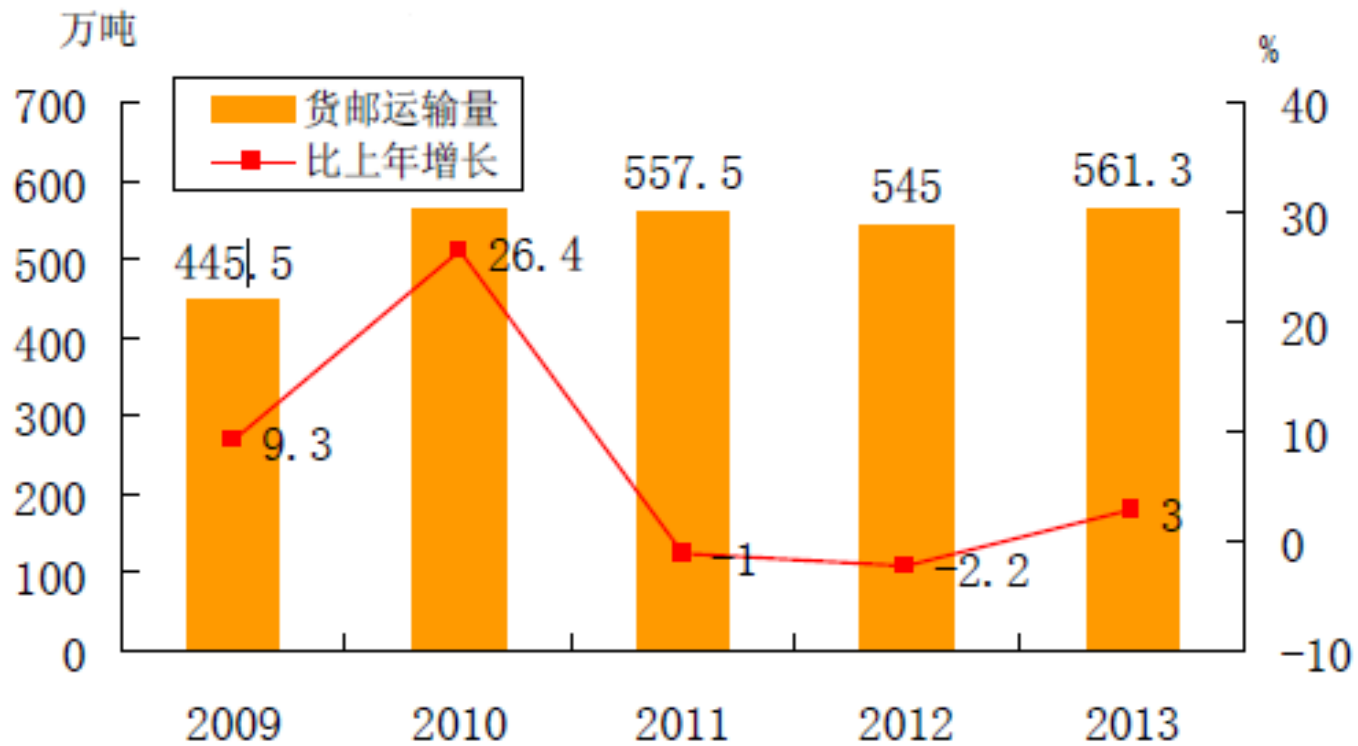
Unit: 0.1billion ton km

Passenger Traffic 2009-2013



Unit: 0.1billion

Air Cargo Traffic 2009-2013



Unit: 10 thousand ton

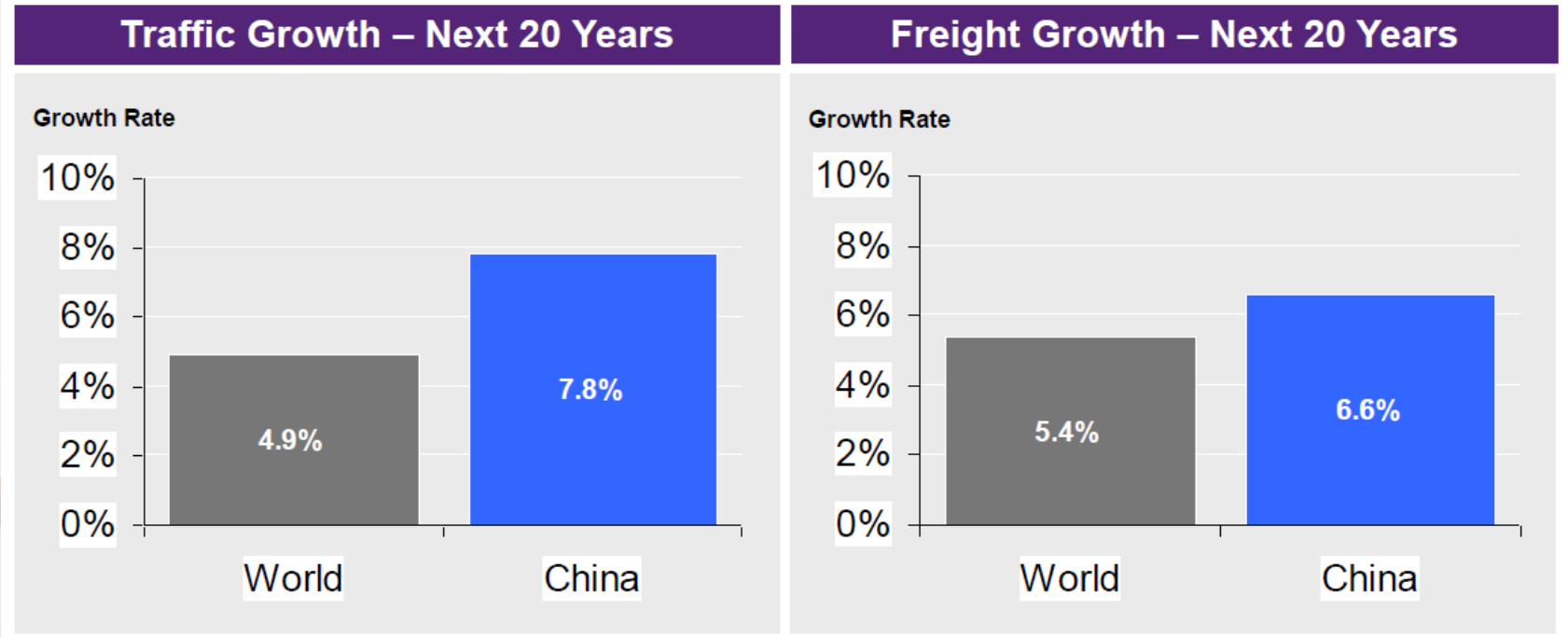
Fleet Size 2006-2013

2006-2013年全国民航运输飞机数量



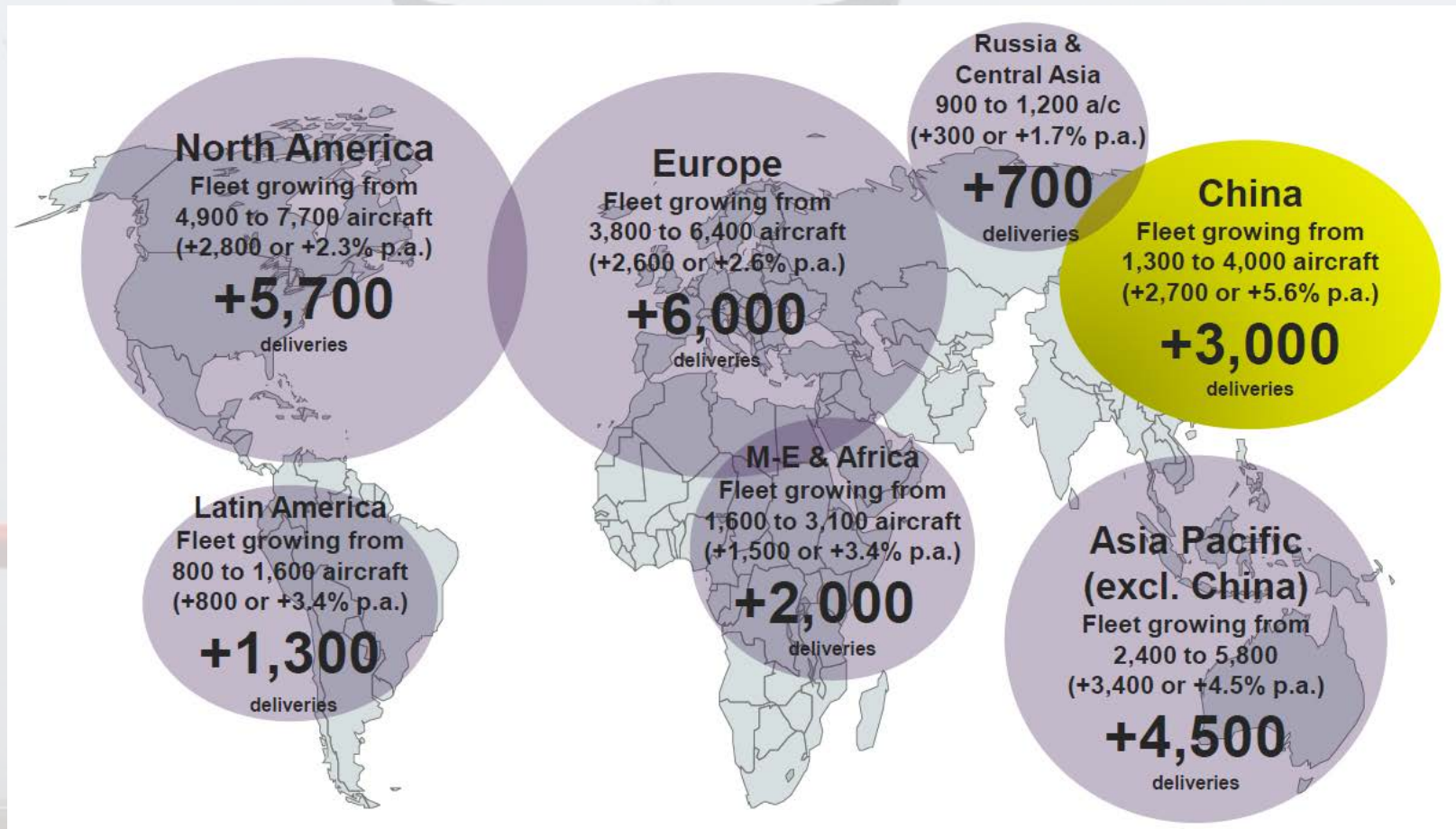
数据来源：中国民用航空局；制图：民航资源网 (www.CARNOC.com)

China's Air Travel Demand Is Expected To Grow At Nearly 8% Per Annum Through 2028



Source: Boeing Current Market Outlook

China's Air Transport Fleet Will Triple Over The Next 20 Years And Receive 13% Of Total Deliveries



Source: AeroStrategy estimates, data includes airliner and freighter deliveries, RJ excluded, 2008.

New Airplane Deliveries to China: 2013-2032

<i>Airplane type</i>	<i>Seats</i>	<i>Total deliveries</i>	<i>Dollar value</i>
Regional jets	90 and below	240	\$10B
Single-aisle	90-230	3,900	\$370B
Small wide-body	200-300	730	\$170B
Medium wide-body	300-400	610	\$200B
Large wide-body	400 and above	100	\$30B
Total		5,580 (16% of world total)	\$780B (16% of world total)

Source: Boeing, 2013.

<http://boeing.mediaroom.com/2013-09-05-Boeing-Forecasts-Chinas-Fleet-to-Triple-Over-Next-20-Years>

Challenges - Major Infrastructural Constraints

Air Traffic Management



- ATM is a major impediment to growth
- People's Liberation Army's (PLA) control over the nation's skies (~80%)
- Lack of military-civil aviation collaboration mechanism.

Airports

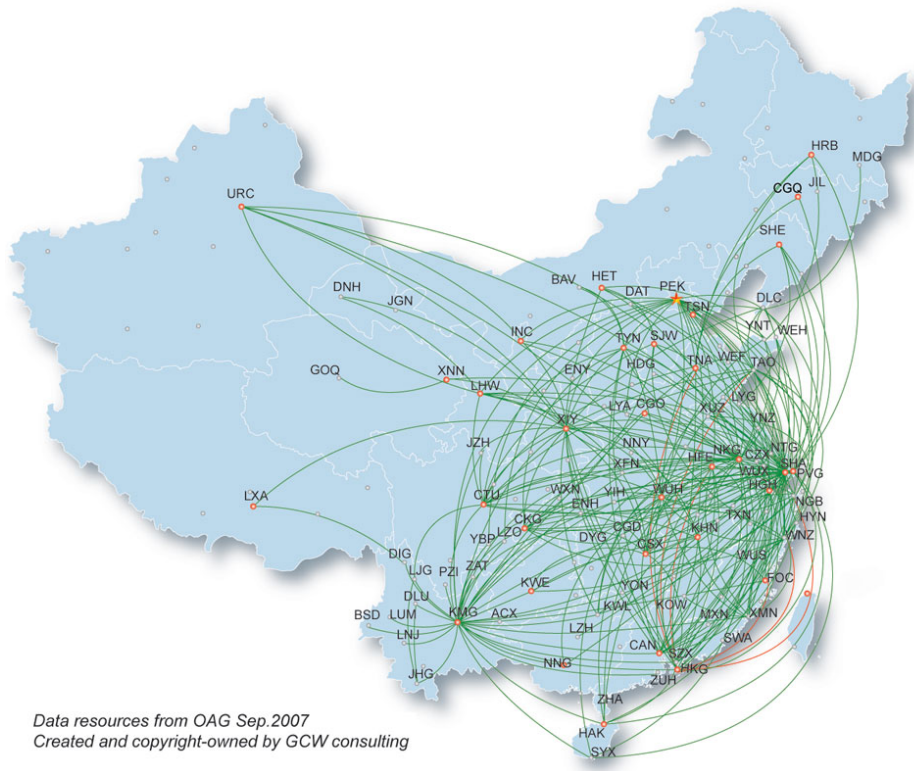


- To the end of 2013, China has 193 commercial airports. By 2020, the number is estimated as 244.
- Its airport density is one of the world's lowest
- Of 30 busiest airports worldwide in 2009, 14 were in US, just 3 in China (Beijing, Hong Kong, Guangzhou)

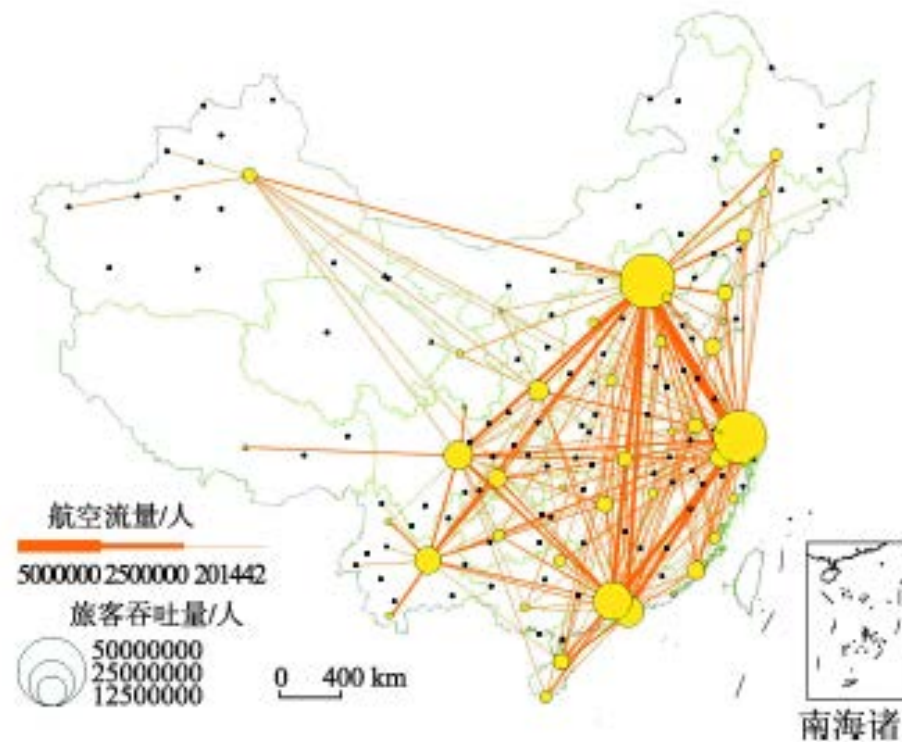
Source:

Project 2049 Institute, "China's Commercial Aviation Sector Looks to the Future."
China's 12th Five-Year Plan (2011-2015)

Challenges – Imbalanced Air Route Network and Concentrated Traffic in East Coast of China



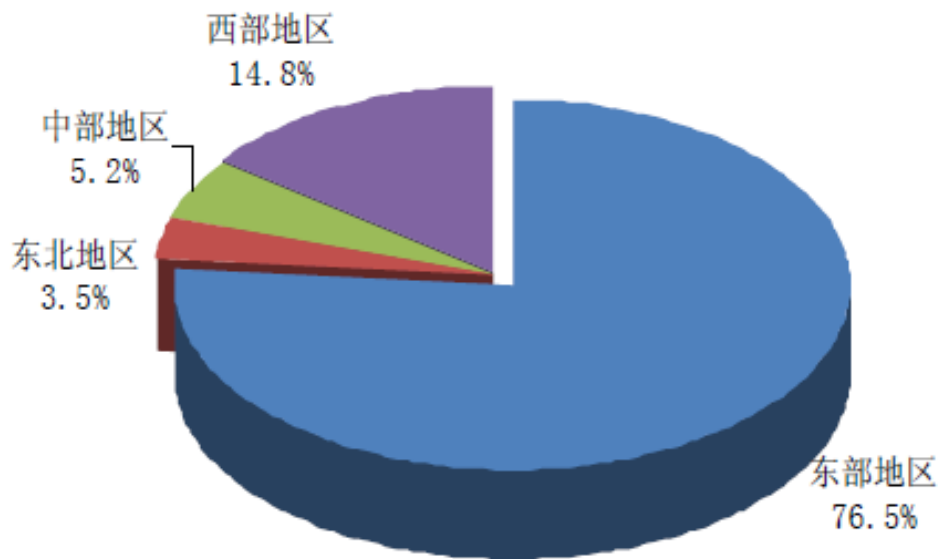
Data resources from OAG Sep.2007
Created and copyright-owned by GCW consulting



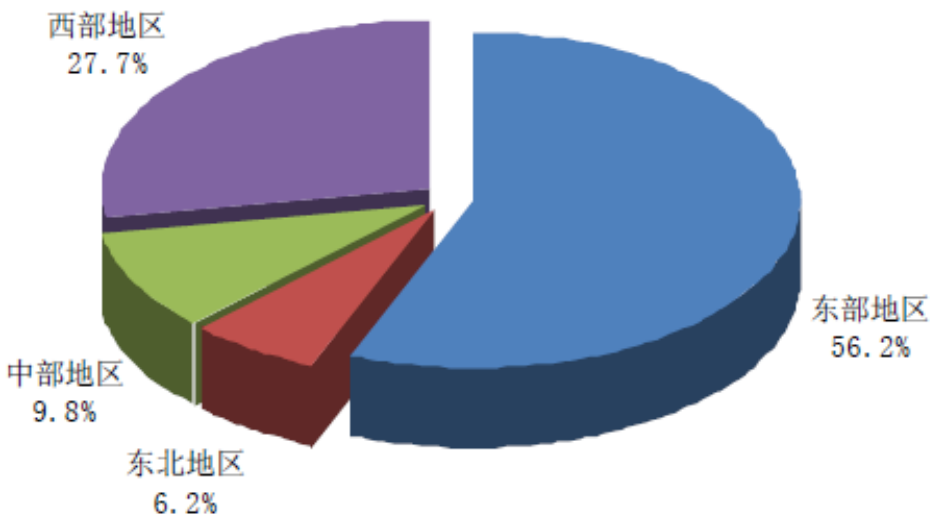
The “golden triangle” air corridors linking Beijing, Shanghai, and Guangzhou are reportedly near saturation. And most of large airports in China is reaching their capacities.

在各机场中，年货邮吞吐量达到1万吨以上的有50个，完成货邮吞吐量占全部机场的98.5%。

2013年机场货邮吞吐量按地区分布

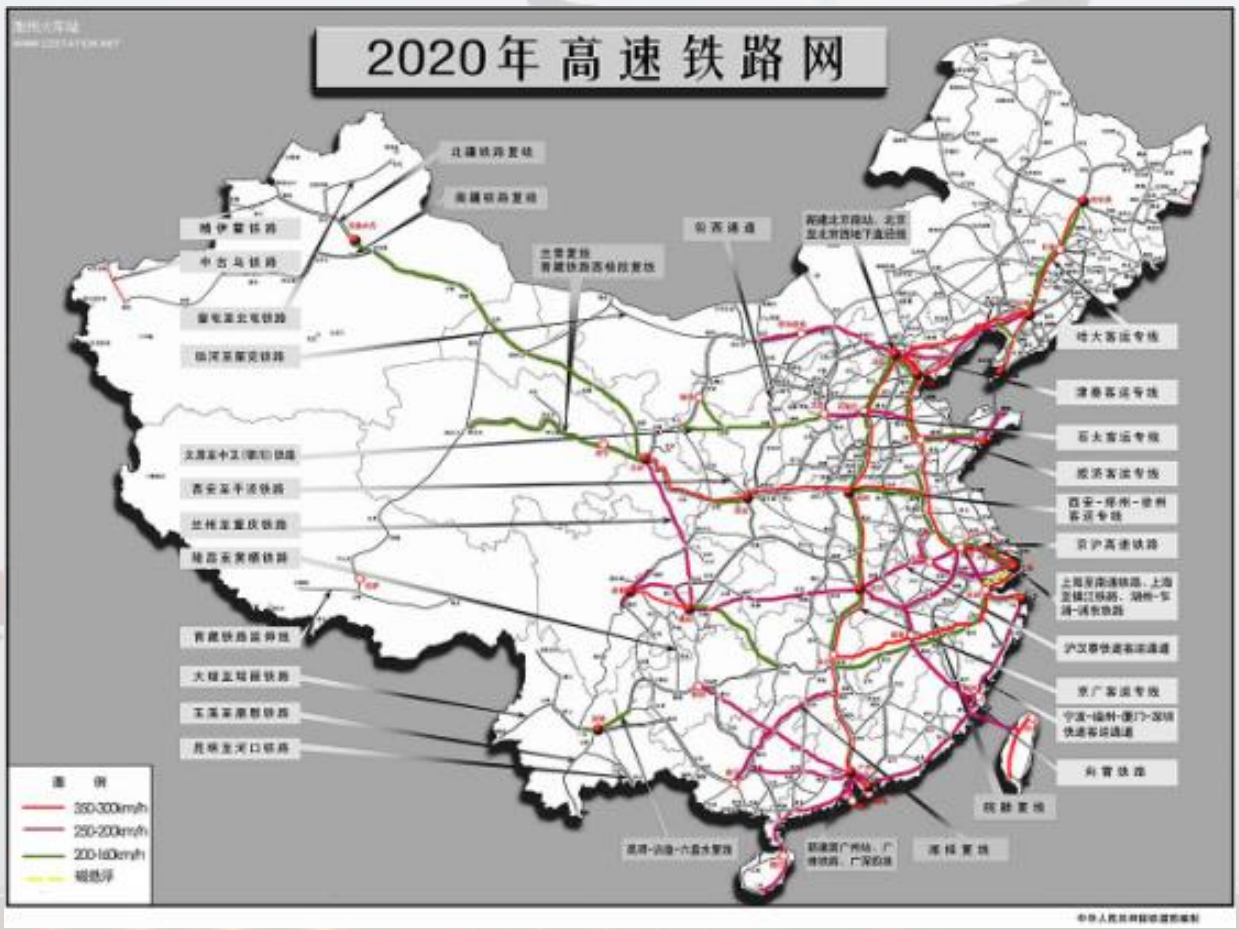


2013年机场旅客吞吐量按地区分布



所有通航机场中，年旅客吞吐量达到100万人次以上的有61个，完成旅客吞吐量占全部机场的95.4%；年旅客吞吐量达到1000万人次以上的有24个，完成旅客吞吐量占全部机场的76.8%。

Challenges – Competition from High-Speed Rail



- Guangzhou–Wuhan: No. of flights reduced and air ticket prices decreased.
- Xian–Zhengzhou: All the original scheduled flights were cancelled.
- Chengdu–Chongqing: Air traffic dropped sharply and many airlines stopped their operation entirely between these two cities.

Challenges – Shortage of Work Force

- Short of pilots, mechanics, air traffic controller and management personnel in air transportation.
- To the end of 2012, there are 8518 captains and 13176 co-pilot for commercial airlines in China.
 - However, 10% of the captains are taking management role and fly limited hours.
 - Many of the captains were newly promoted and play the role in half.
- For air traffic controller, the educational system is different.
 - Undergraduate degree.
 - Lack of enthusiasm and motivations due to the reduction of salary starting from last year.
 - The training time for professional skills is limited.

Challenges – Financial Deficit of Medium to Small Airports

- The ownership of airports transferred from central government to provincial government in 2002, except Beijing Capital International Airport and Lhasa Gonggar Airport at Tibet.
- Although there is discretionary funding for the development of medium to small airport from the central government, local authorities are playing more pivotal role. The local government is facing financial challenges overall.
- The application for airport project is tedious and the review and approval process takes long time.
- 70-80% of small airports are red on the balance sheet.

Challenges – Lack of Collaborative Decision Making in Air Traffic Management

- There is no air traffic control system command center (ARTSCC) in China.
- The demand control is done by entrance rate from one center to the other.
- Temporary air routes according to the restricted airspace. No national playbook with pre-validated Severe Weather Avoidance Plan (SWAP) routes in advance.
- Rerouting and diverging are only permitted once the flights in the air.
- Designated diverging airport but the communication for realizing the diverge is tedious and troublesome.
- Lack of performance evaluation and analysis.

On-going Efforts – Infrastructure

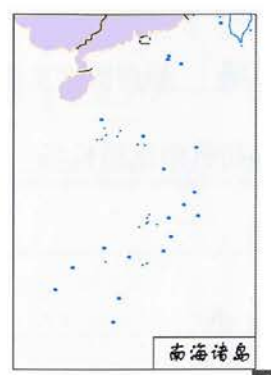
- National Airspace Administration Committee
- Air traffic management summit to discuss the possible solutions and models that can be followed
- More new airports will be constructed during “thirteen five”, including the second airport in Beijing.
- Exploring the private-public partnership (PPP) for airport development.
- Reformation of the management of low altitude airspace for GA and UAS.

全国民用机场布局规划分布图(2020年)

(不含港澳台地区)



图例	名称	个数
●	06年底通航机场	147
▲	十一五计划新增	45
■	2011-2020计划新增	52
	总计	244



南海诸岛

On-going Efforts – Intermodality

- **Air-Rail Express:** For busy airport such as Beijing Capital International airport, passengers are encouraged to take flights at Shijiazhang Zhengding International by taking high speed rail to Tianjin. Tianjin airport offer free shuttle to pick up passengers from the rail station and airlines sometime reimburse the train tickets.



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3 填写您的乘机资料并选择您所需要的增值服务



4 确认您的行程及需要支付的费用




5 支付您本次出行的总费用

On-going Efforts – Education for Next Generation Work Force

- Major projects for university infrastructure construction and facility improvement: 3.4 billion Chinese Yuan (~\$0.6 billion).
- Sino-European Institute of Aviation Engineering (SIAE)
- Fellowship for short-term study-abroad, ACP training

On-going Efforts – Air Traffic Flow Management

- Regional offices are working with technology companies, national research institutes to develop ATFM tools and platform.
- US-China Aviation Cooperation Program (ACP)
- Memorandum between CAAC and FAA on ATFM
- Research centers sponsored by CAAC and NATC have been established at CAUC and NUAA.
- Performance evaluation and analysis



Yu Zhang

yuzhang@usf.edu

Yifei Zhao

yifei6666@sina.com

Large Airports with More Than 100 million Passenger Throughput in Mainland China

