



Flexible Use of Airspace in China

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Airspace Management Center

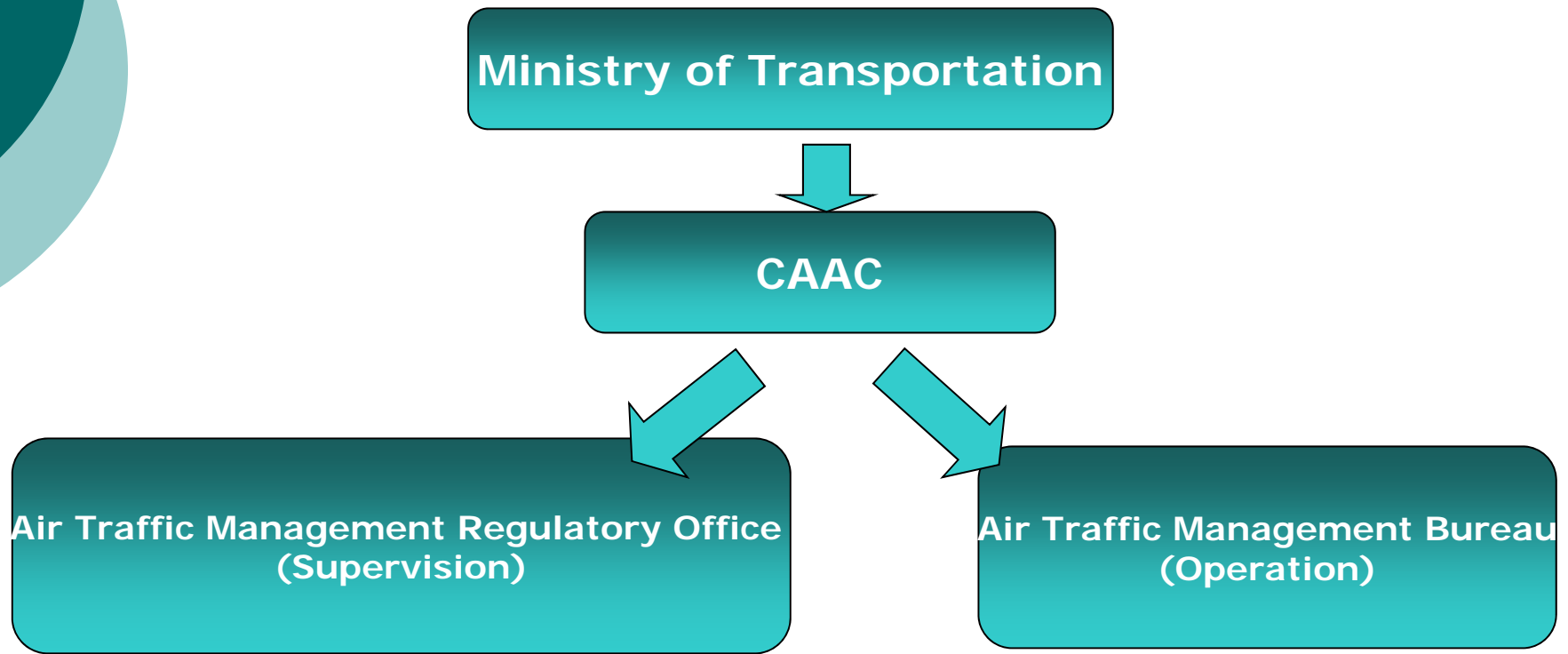
**Air Traffic Management Bureau
Beijing**



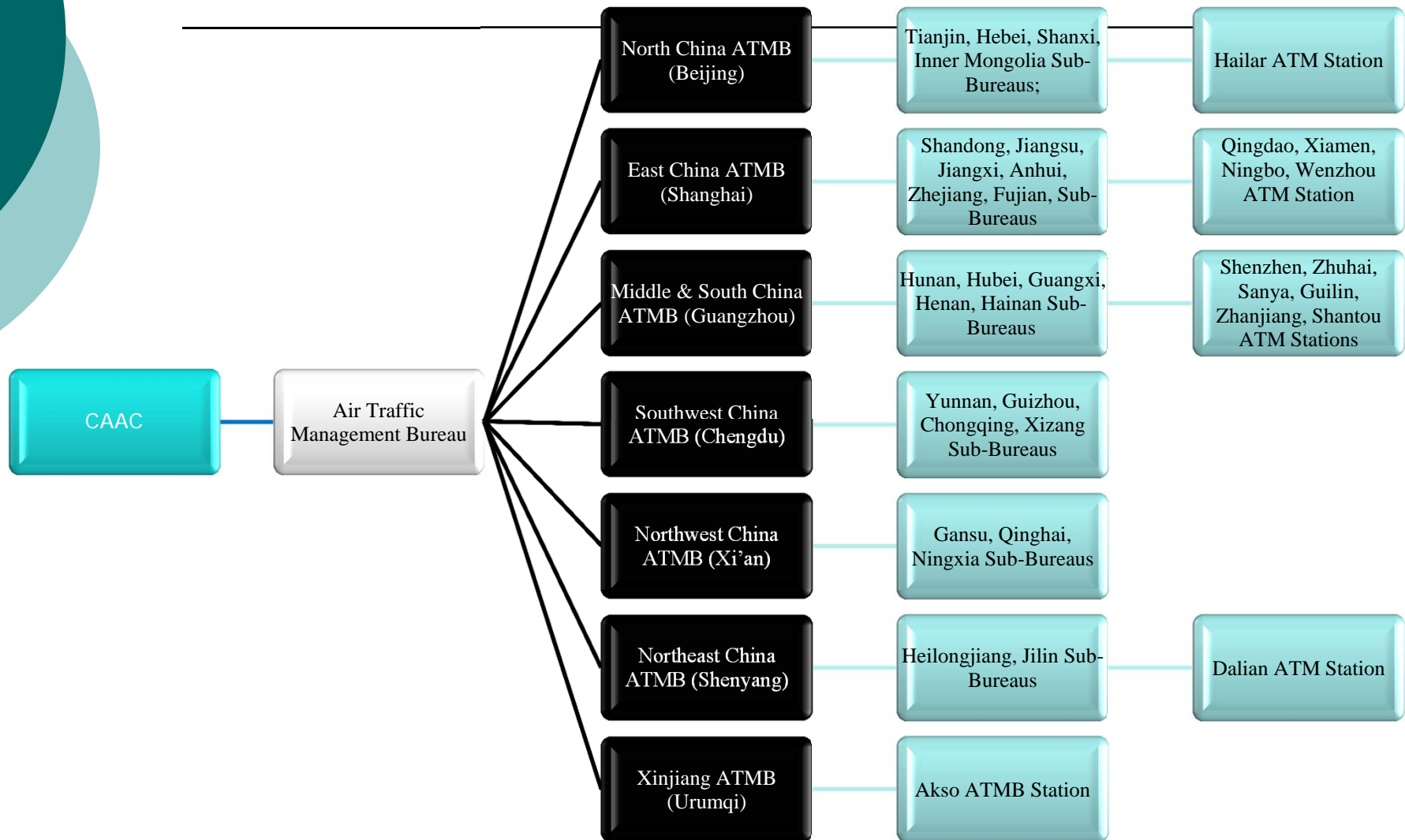
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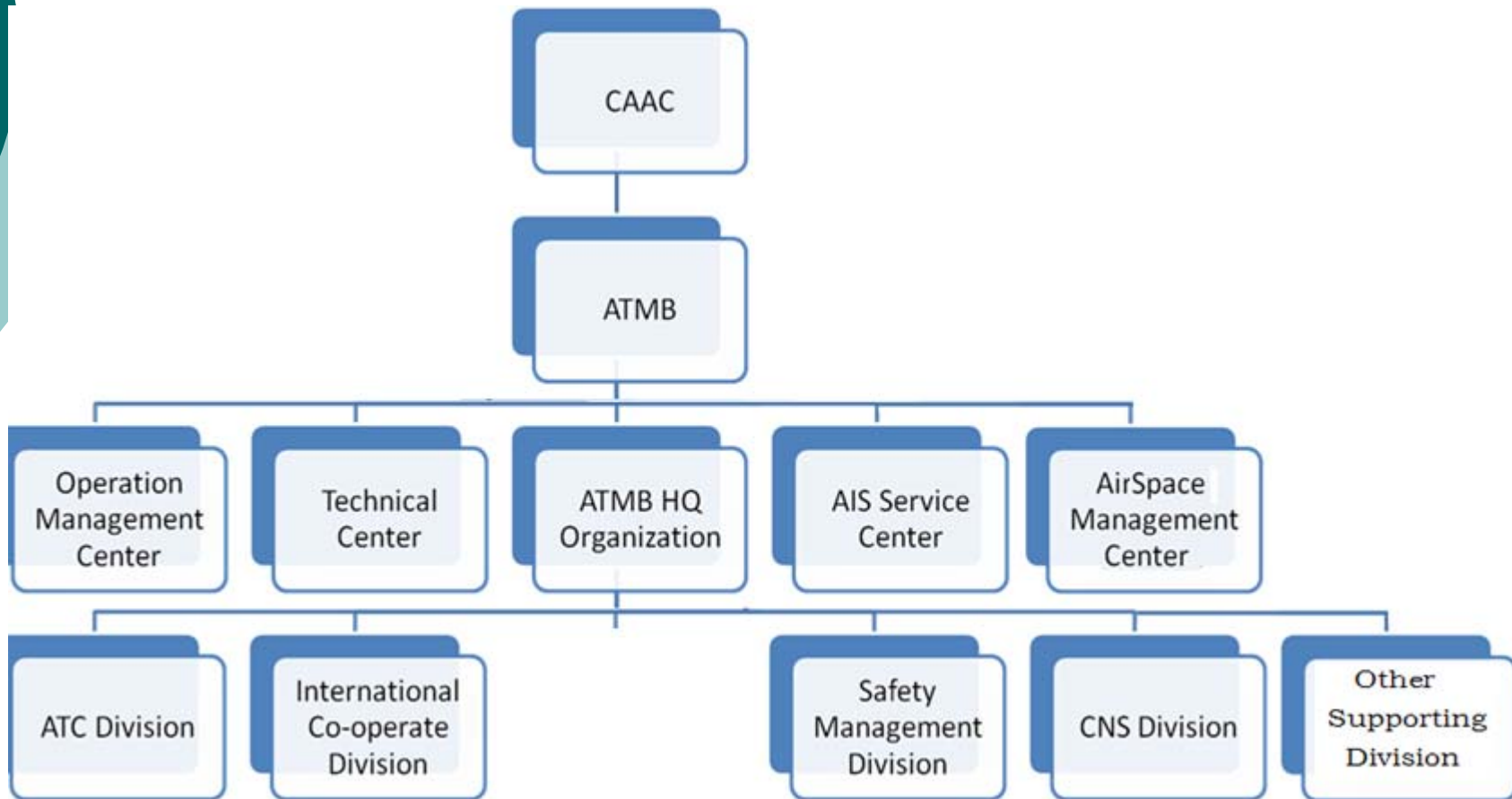
Basics of ATMB and China Airspace Management



Basics of ATMB and China Airspace Management



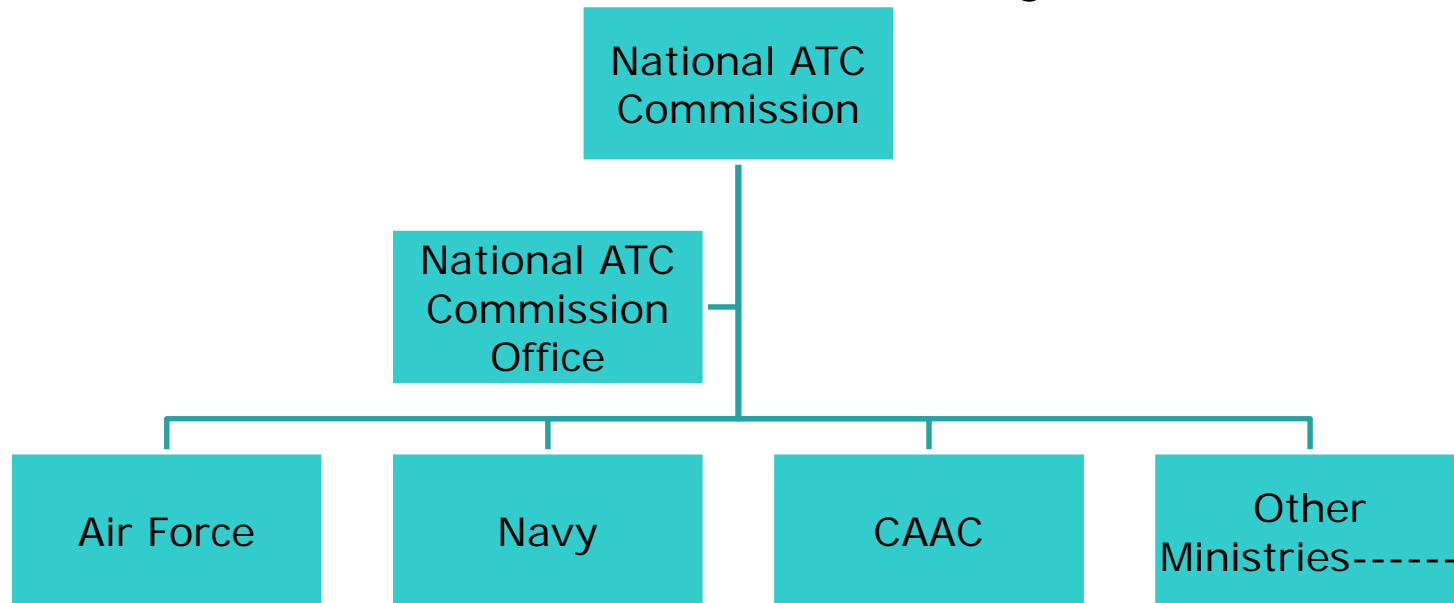
Basics of ATMB and China Airspace Management



Operational structure of ATMB HQs

Basics of ATMB and China Airspace Management

- National Air Traffic Control System China



The National ATC Commission is usually lead by a vice-Prime Minister
Its Office is established at the Headquarters of the General Staff of
the P.L.A

Basics of ATMB and China Airspace Management

- Airspace Users
 - Commercial Aviation
(47 airlines, 1954 aircraft)
 - General Aviation
(about 1800 aircraft)
 - Military Aviation



Basics of ATMB and China Airspace Management



Three types of user are developing very fast, with the airspace being increasingly congested

Basics of ATMB and China Airspace Management



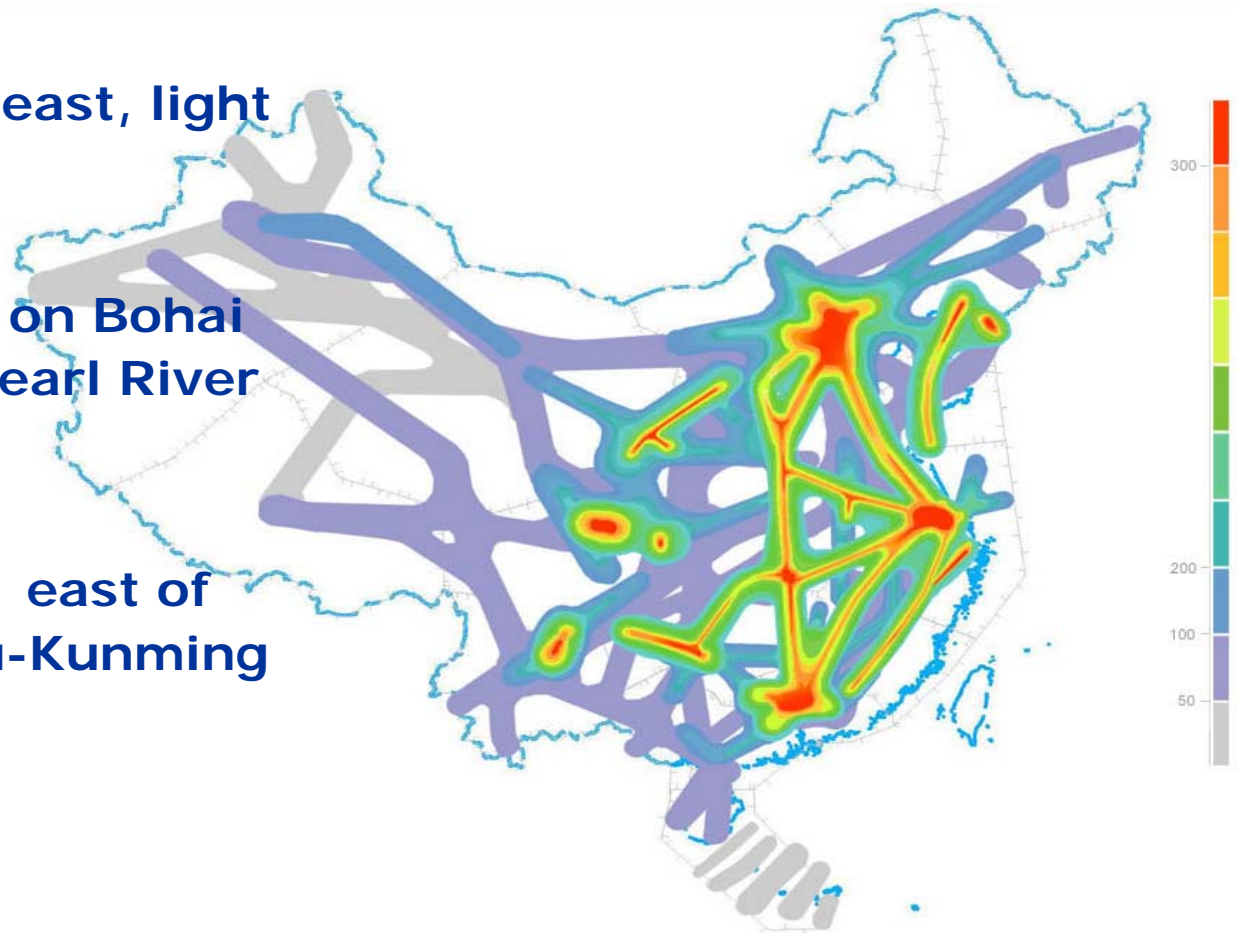
Three ACCs(Beijing, Guangzhou and Shanghai) has been put into operation since 2003.

Two new ACCs(Chengdu, Xi'an) has been put into operation in 2013

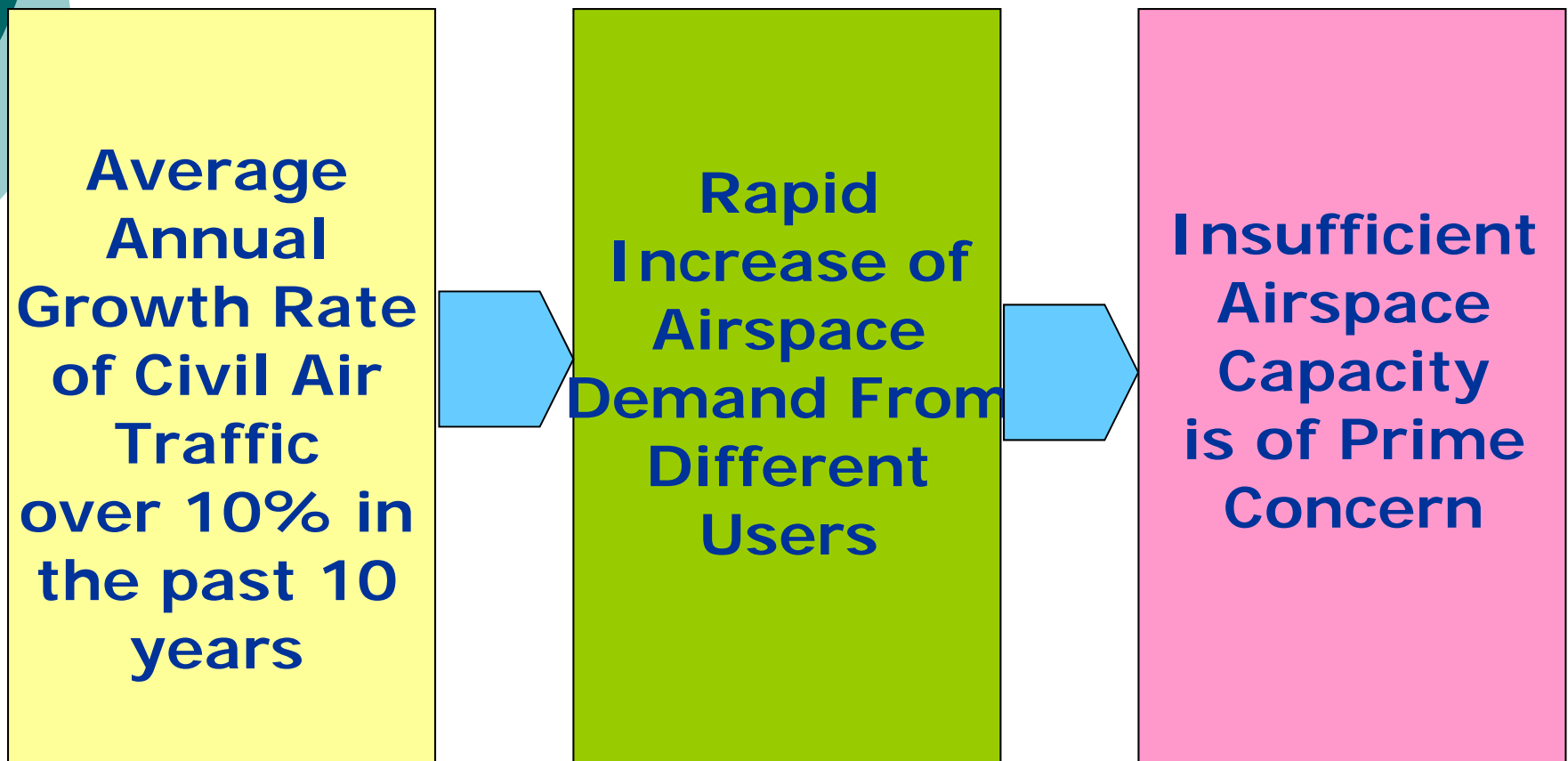
ATMB will integrate 20 Upper Control Areas into 7 greater Upper Control Areas in next five years, with the purpose of reducing coordination and expediting traffic flow.

Basics of ATMB and China Airspace Management

- Traffic flow heavy in east, light in west
- Highest density lies on Bohai Gulf, Yangtze Delta, Pearl River Delta areas
- Busy routes lies in east of Beijing-Xi'an-Chengdu-Kunming

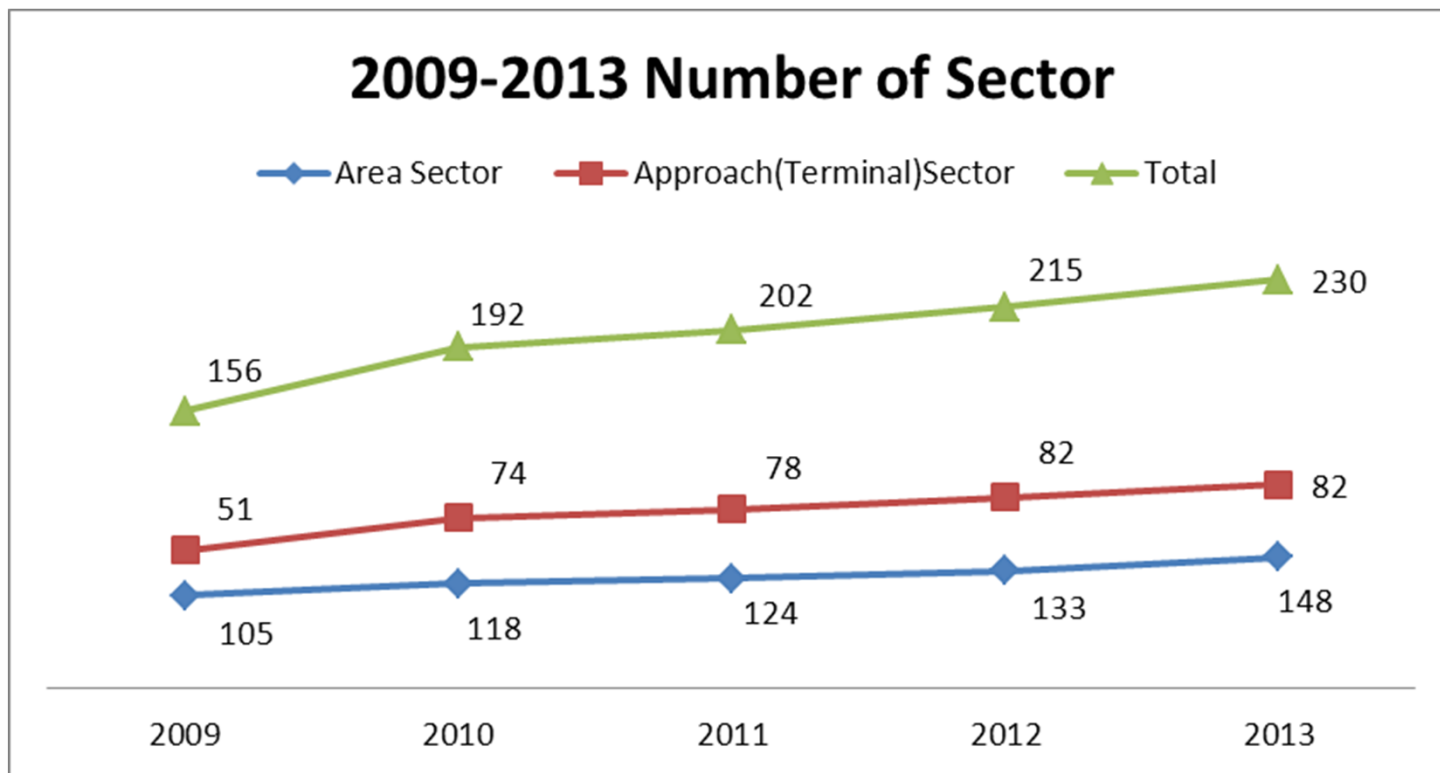


Evolution of Airspace Demand in China



Evolution of Airspace Demand in China

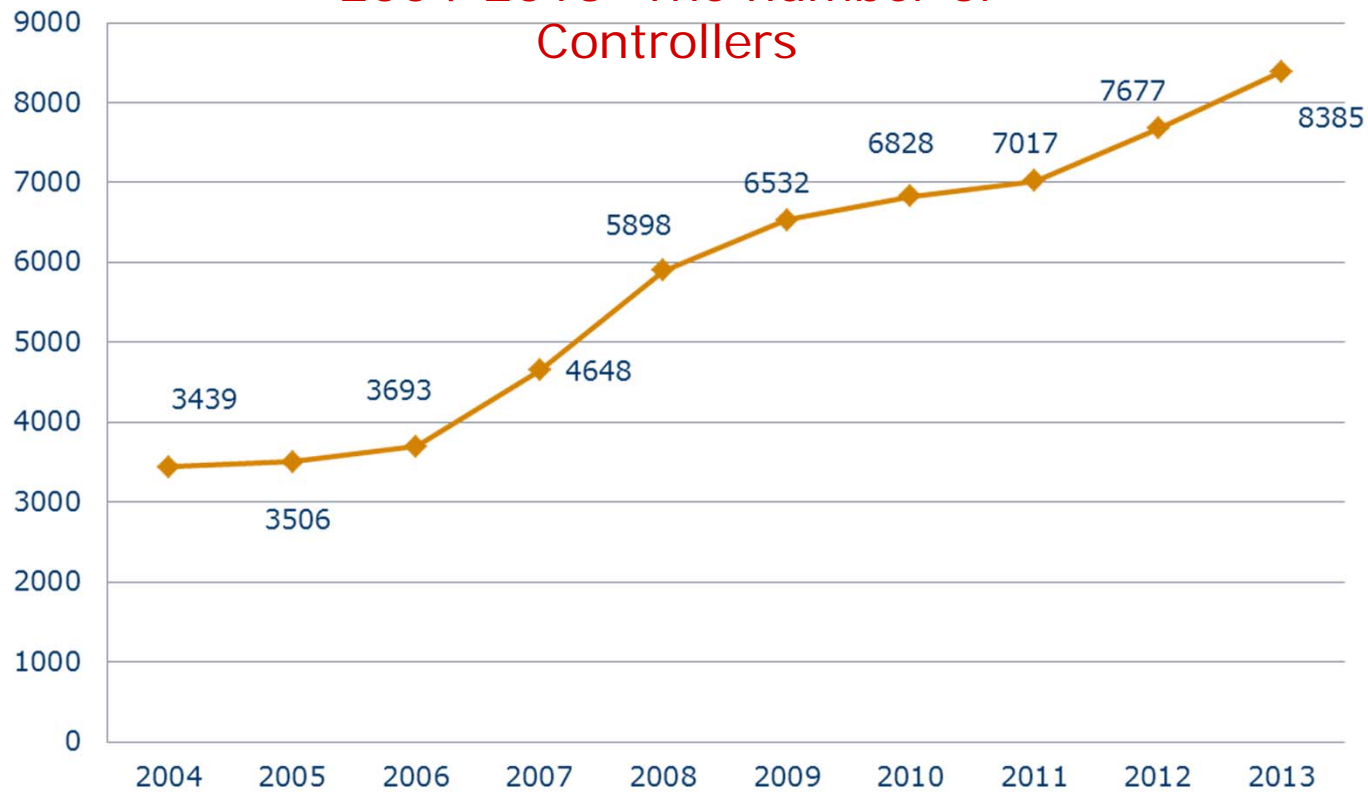
- Control Sectors



Evolution of Airspace Demand in China

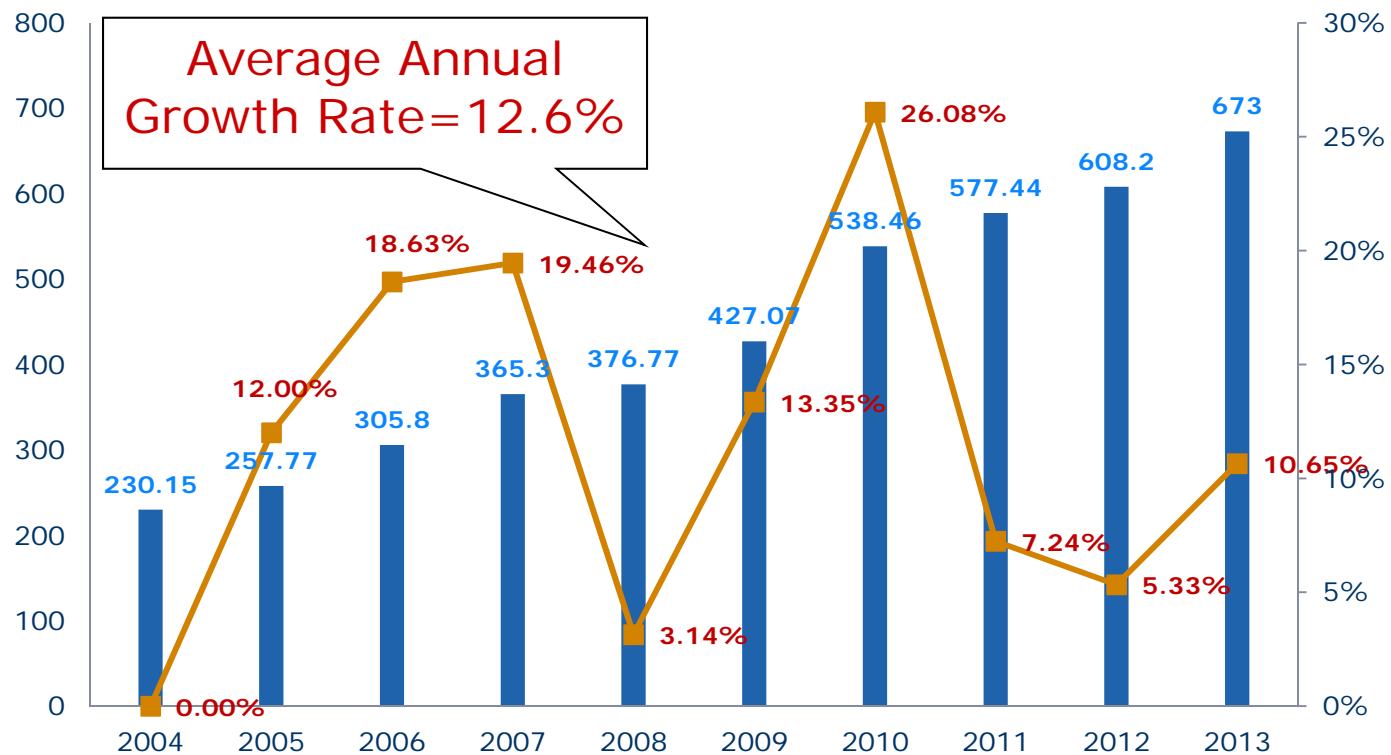
Controller Workforce

2004-2013 The number of
Controllers



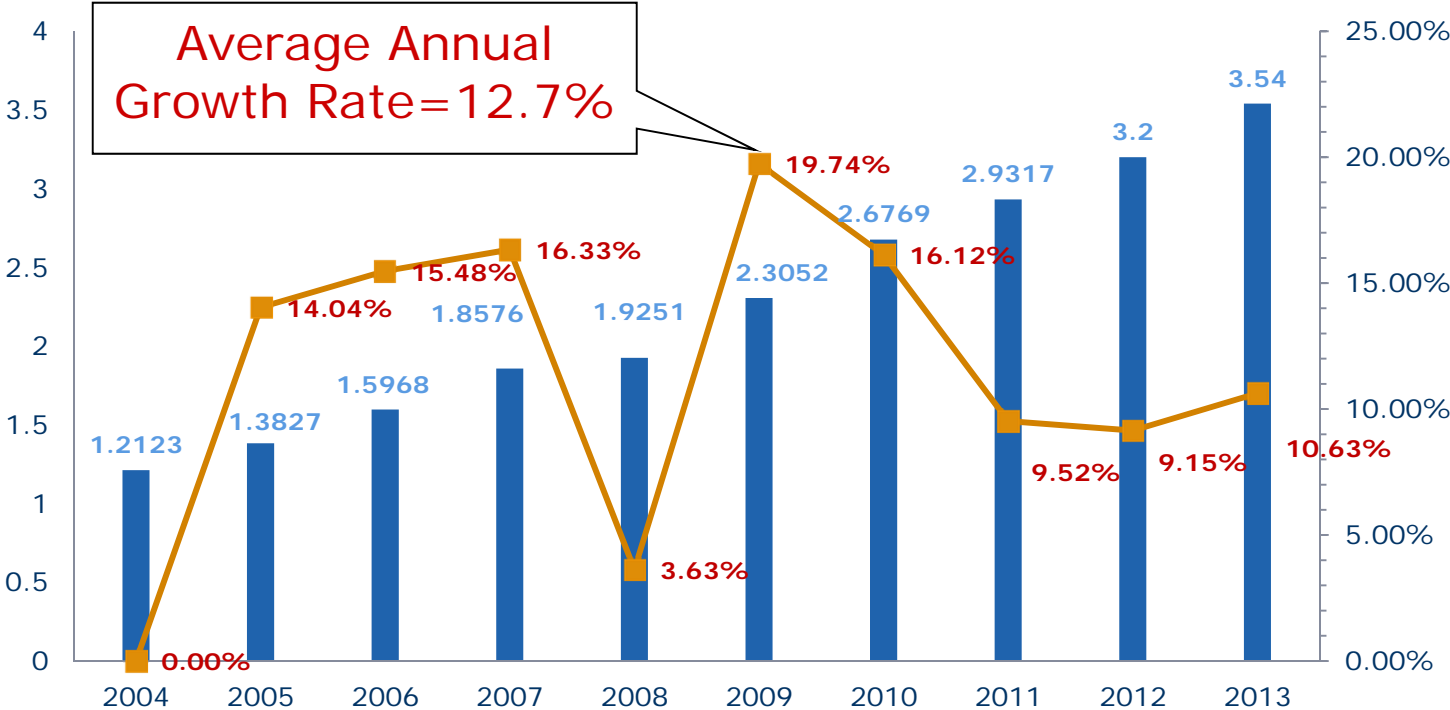
Evolution of Airspace Demand in China

Volume of Air Transportation Turnover (in hundred million ton*km)



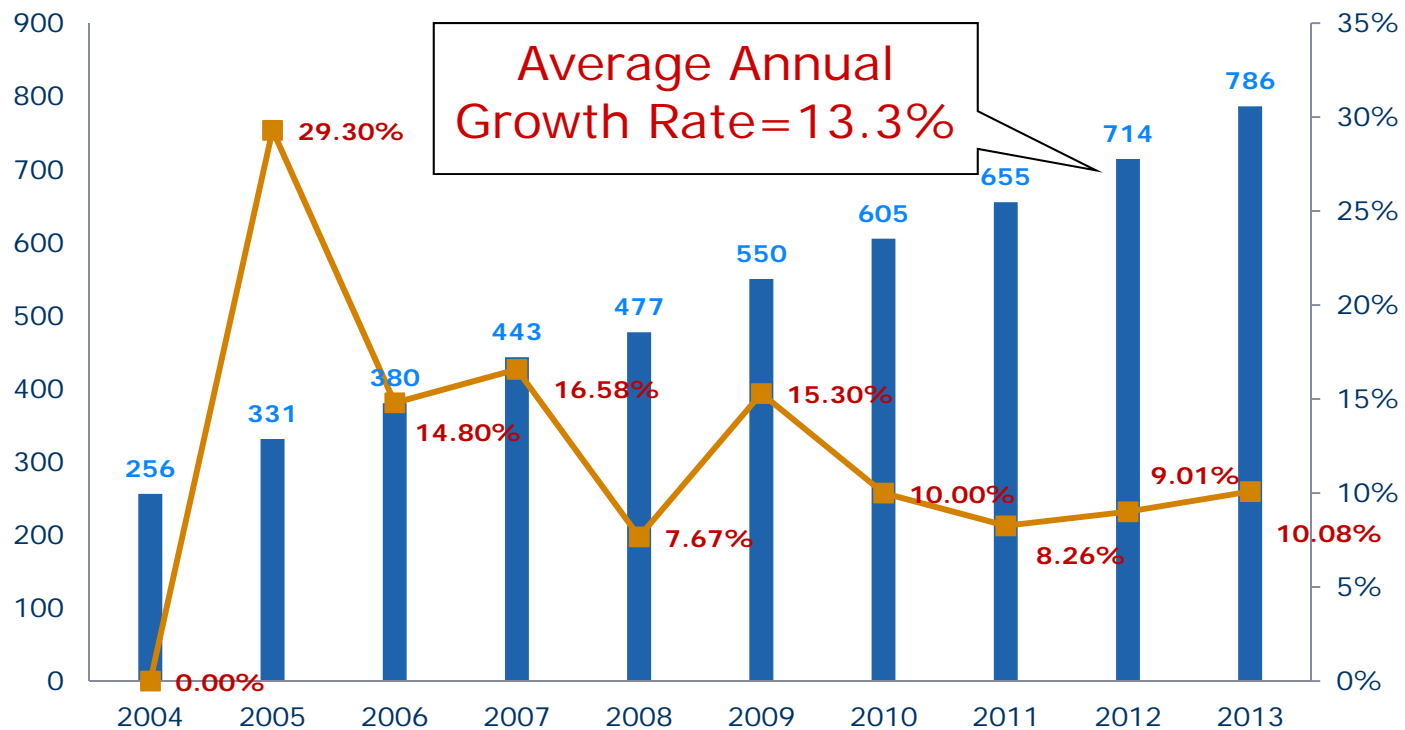
Evolution of Airspace Demand in China

Volume of Passenger (hundred million)

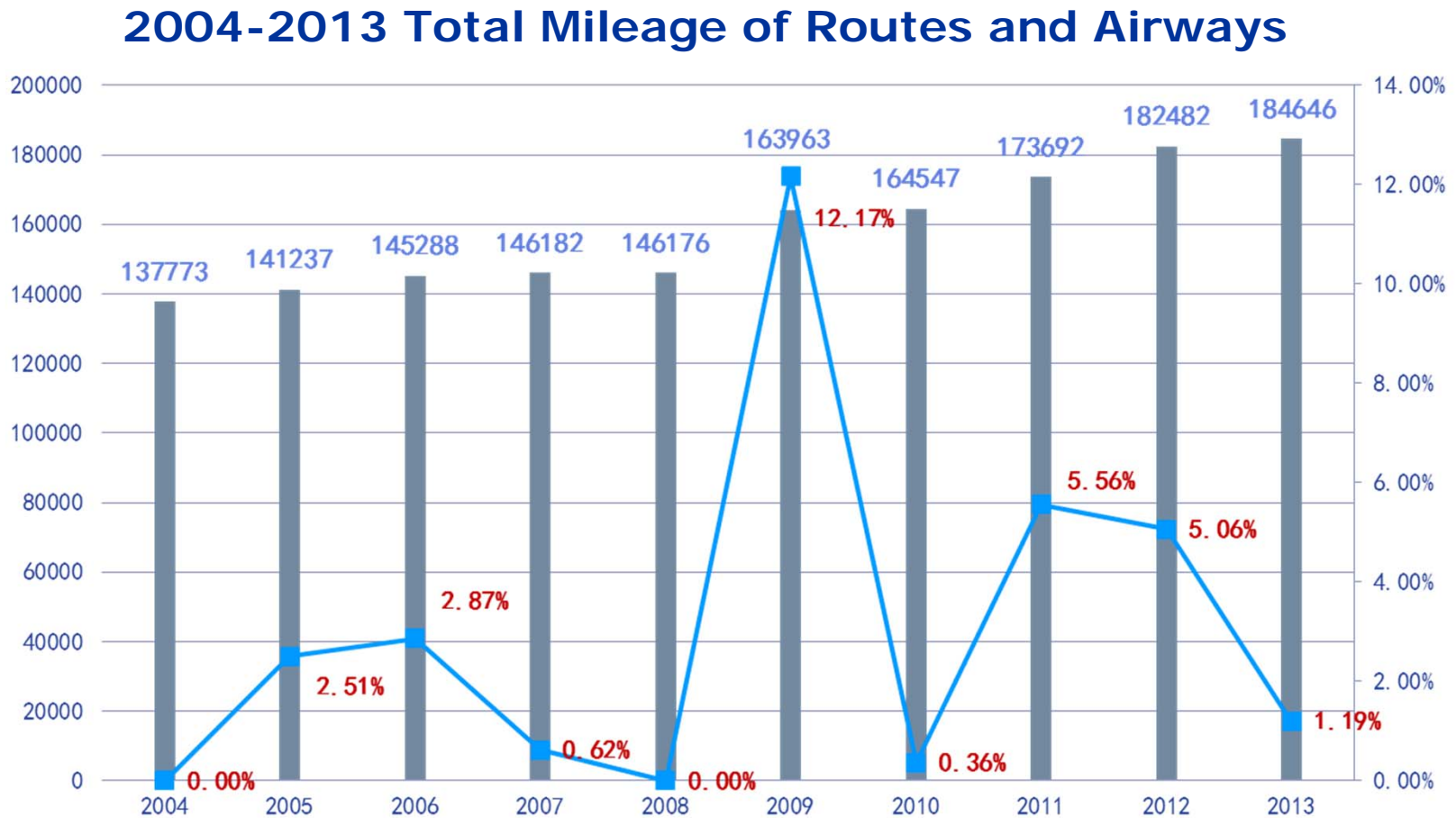


Evolution of Airspace Demand in China

Volume of Aircraft Movements (Ten Thousand)



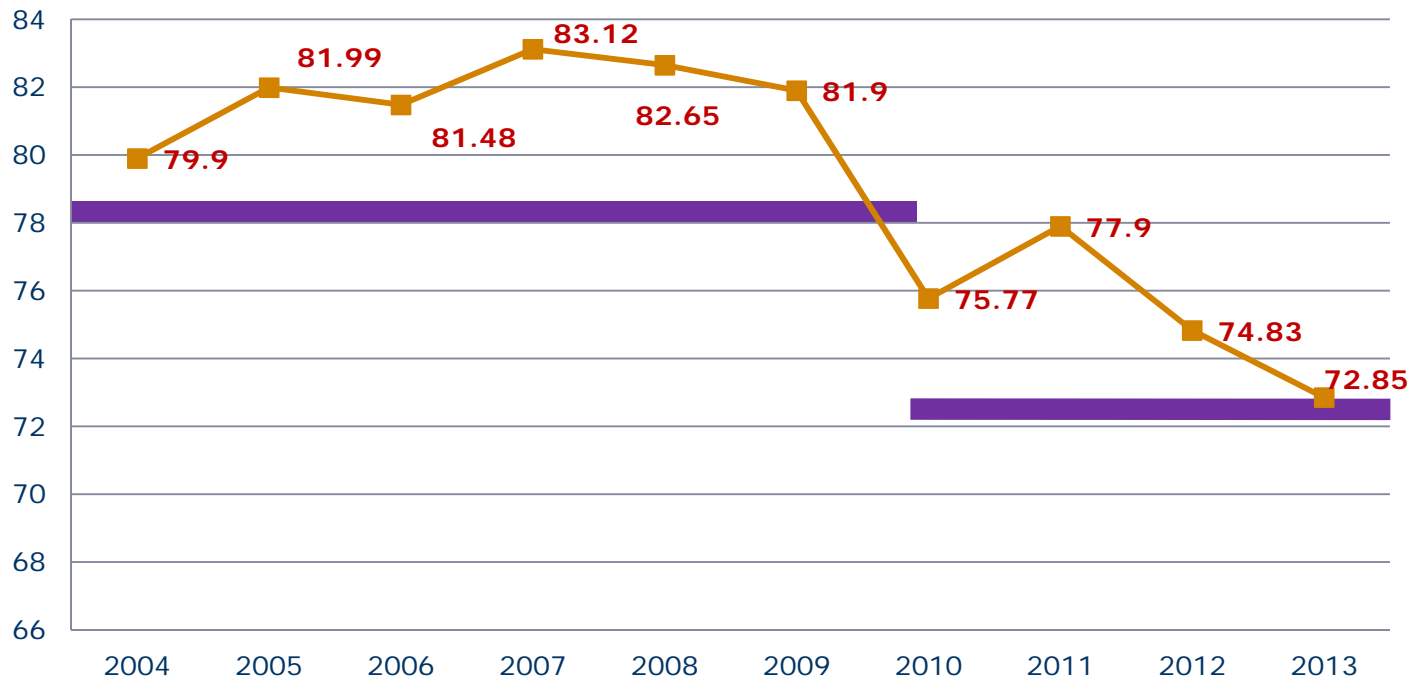
Development of Flexible Use of Airspace in China



Annual total distance of route increased around 3.31%

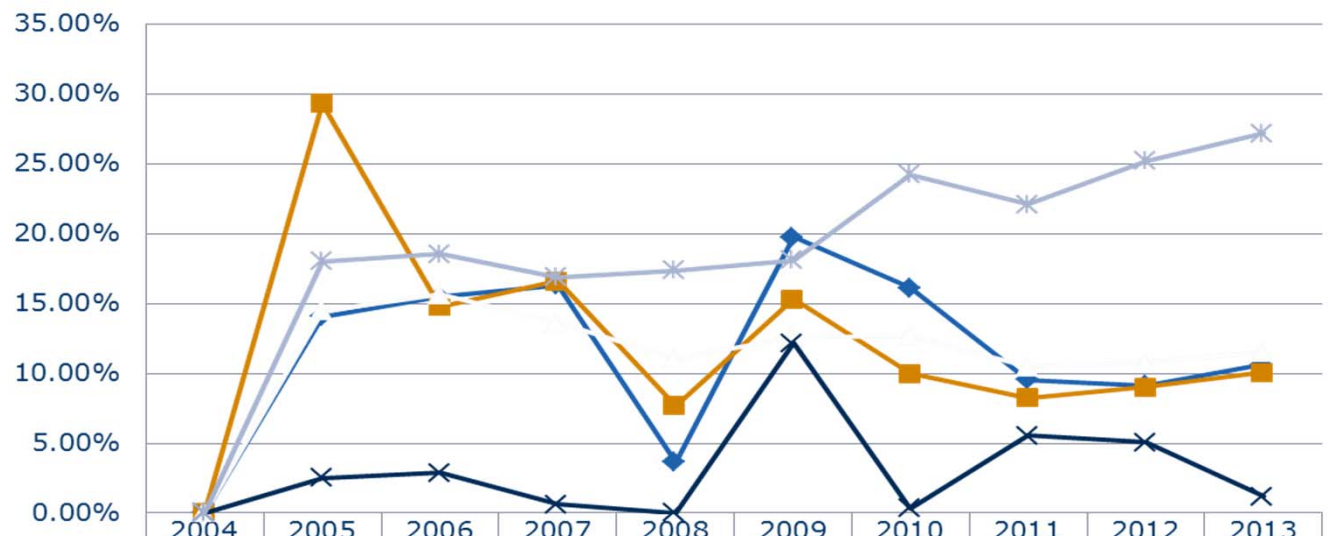
Evolution of Airspace Demand in China

Flight Punctuality (%)



Evolution of Airspace Demand in China

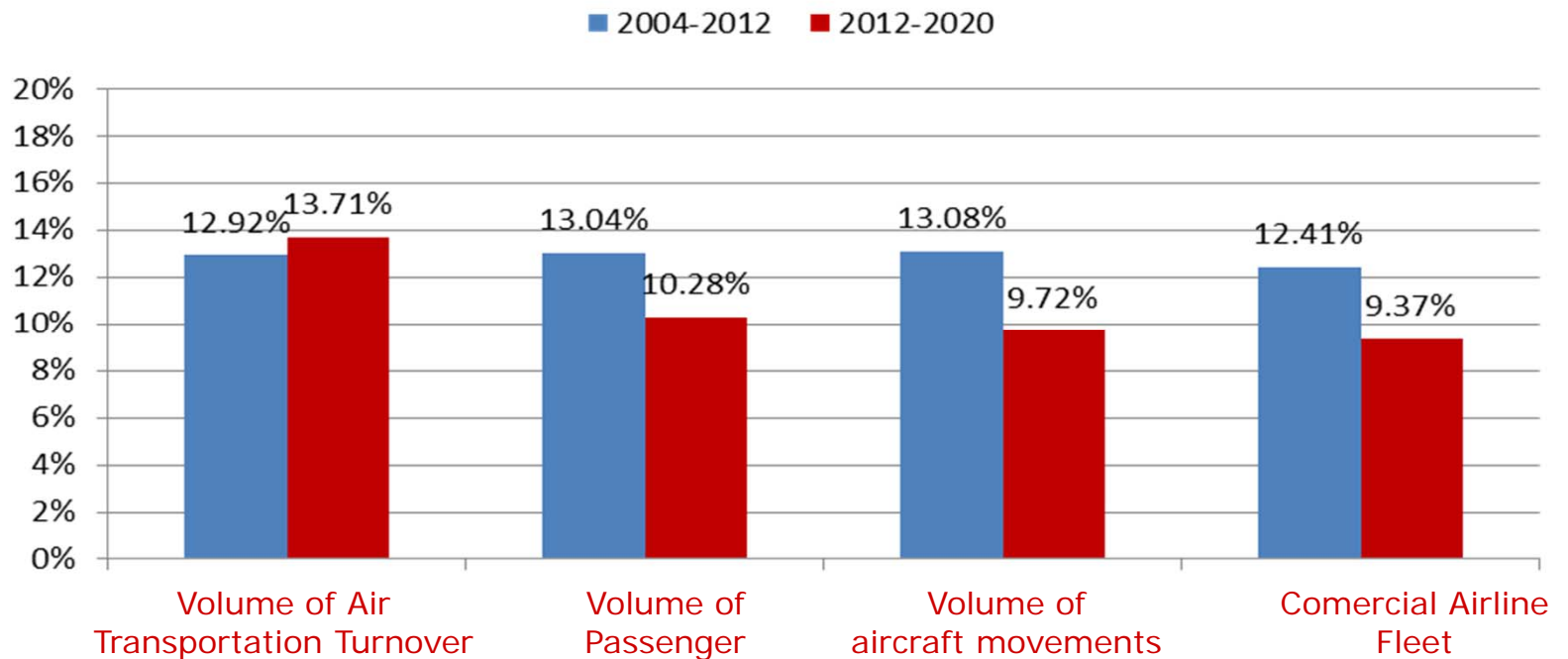
Comparison of Aviation Development Index(2004-2013)



◆ Growth rate of passenger traffic volume	0.00%	14.04%	15.48%	16.33%	3.63%	19.74%	16.12%	9.52%	9.15%	10.63%
■ Growth rate of takeoff and landing	0.00%	29.30%	14.80%	16.58%	7.67%	15.30%	10.00%	8.26%	9.01%	10.08%
● Growth rate of airline fleet	0.00%	14.46%	15.64%	13.63%	11.02%	12.55%	12.70%	10.46%	10.77%	11.51%
✕ Growth rate of route and airway distance	0.00%	2.51%	2.87%	0.62%	0.00%	12.17%	0.36%	5.56%	5.06%	1.19%
* Rate of flight delay	0.00%	18.01%	18.52%	16.88%	17.35%	18.10%	24.23%	22.10%	25.17%	27.15%

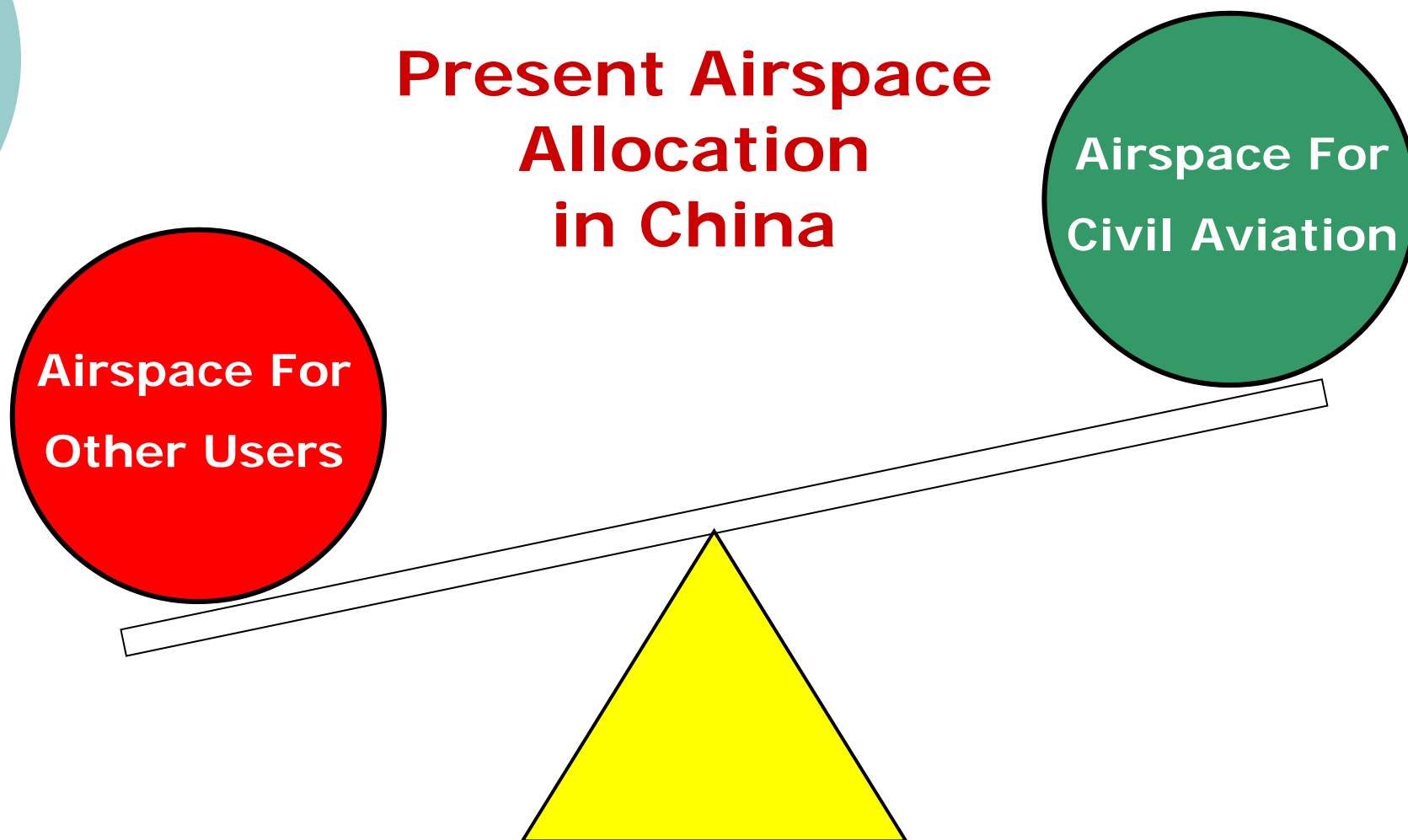
Evolution of Airspace Demand in China

Future Demand Forecast



Forecasted Average Annual Growth Rate

Evolution of Airspace Demand in China

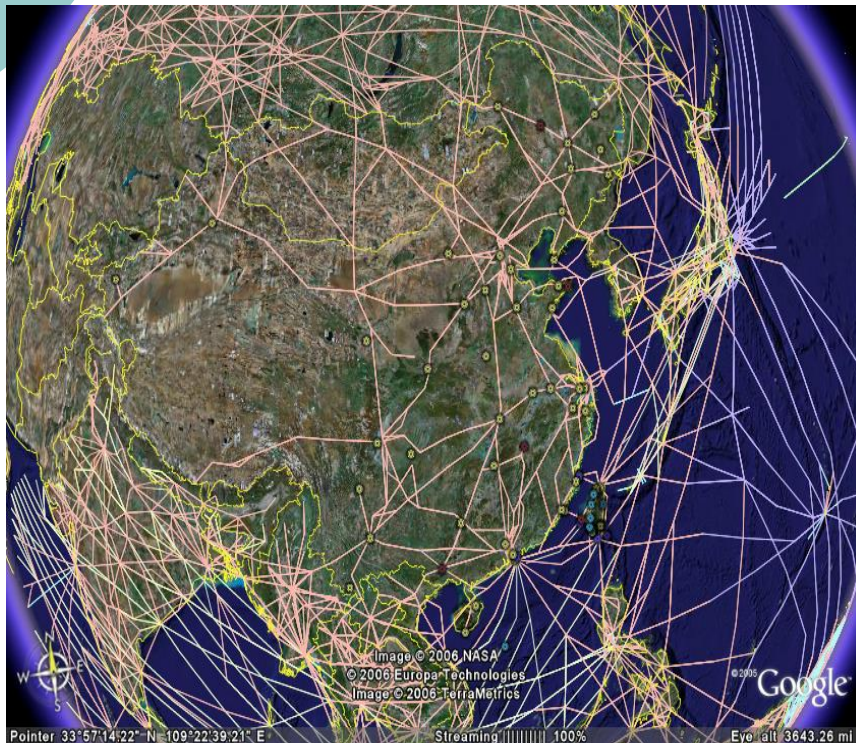


Development of Flexible Use of Airspace in China

Routes and Airways

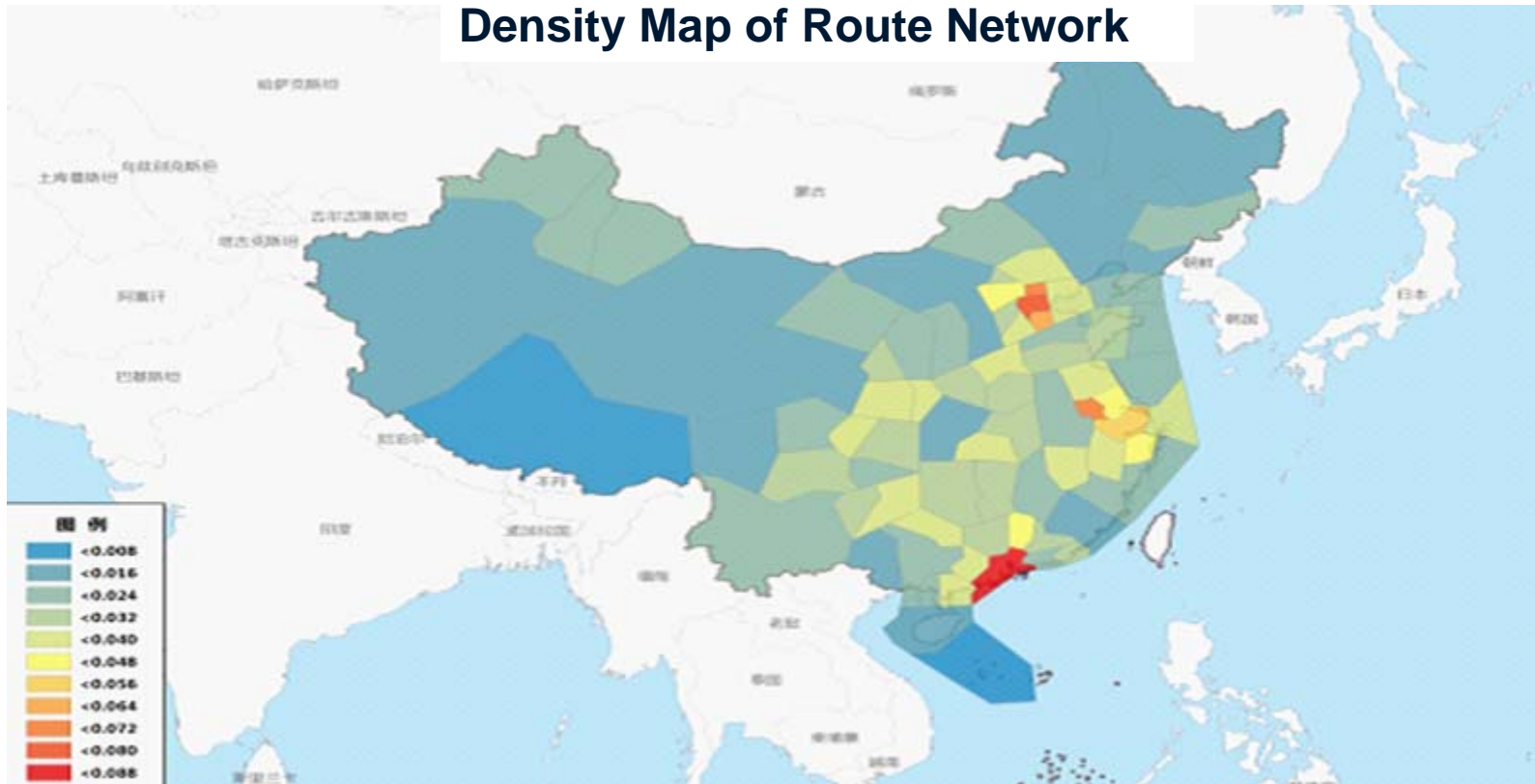
Total distance of route and airway : 184,646 km

International routes and airways : 88,341km



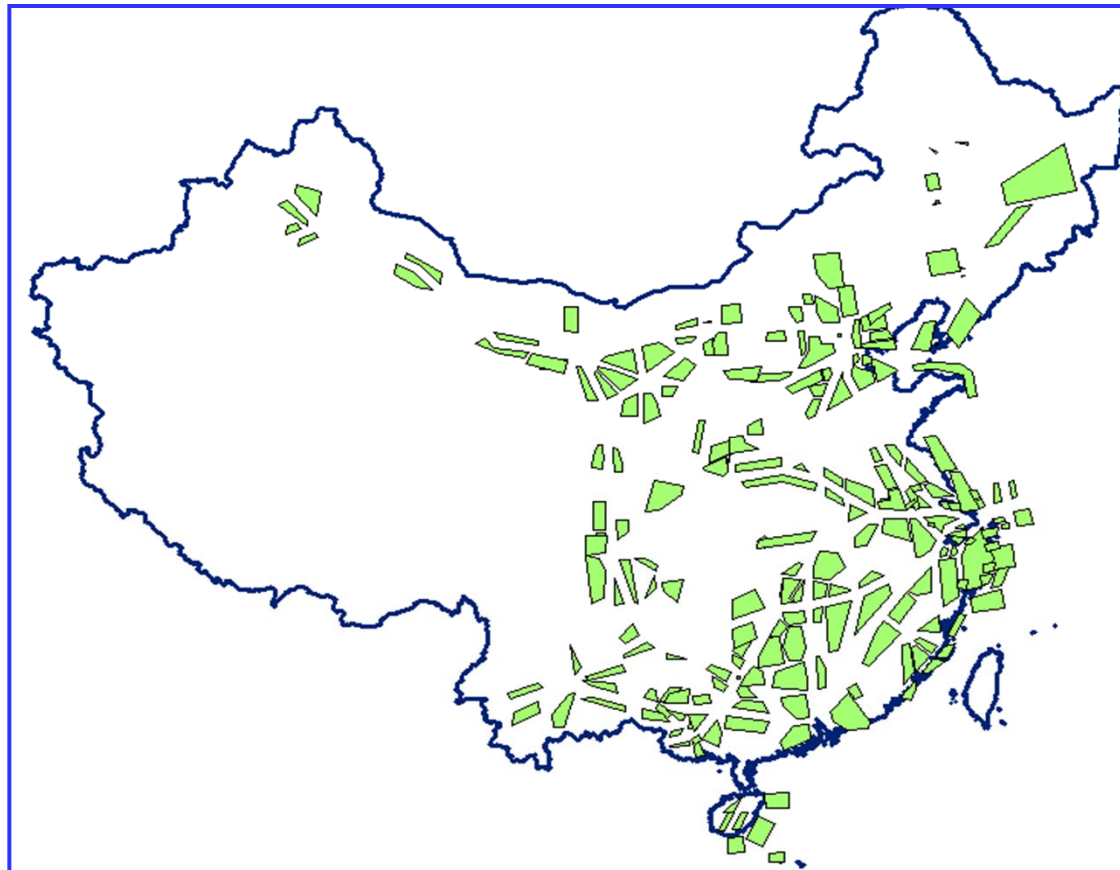
Development of Flexible Use of Airspace in China

Density Map of Route Network



Development of Flexible Use of Airspace in China

Restricted Airspace Distribution





Development of Flexible Use of Airspace in China

- Flexible Use of Airspace (FUA): Airspace is flexibly shared by different airspace users according to their specific demand
- Fragmentation of airspace use should be reduced with highest efforts.

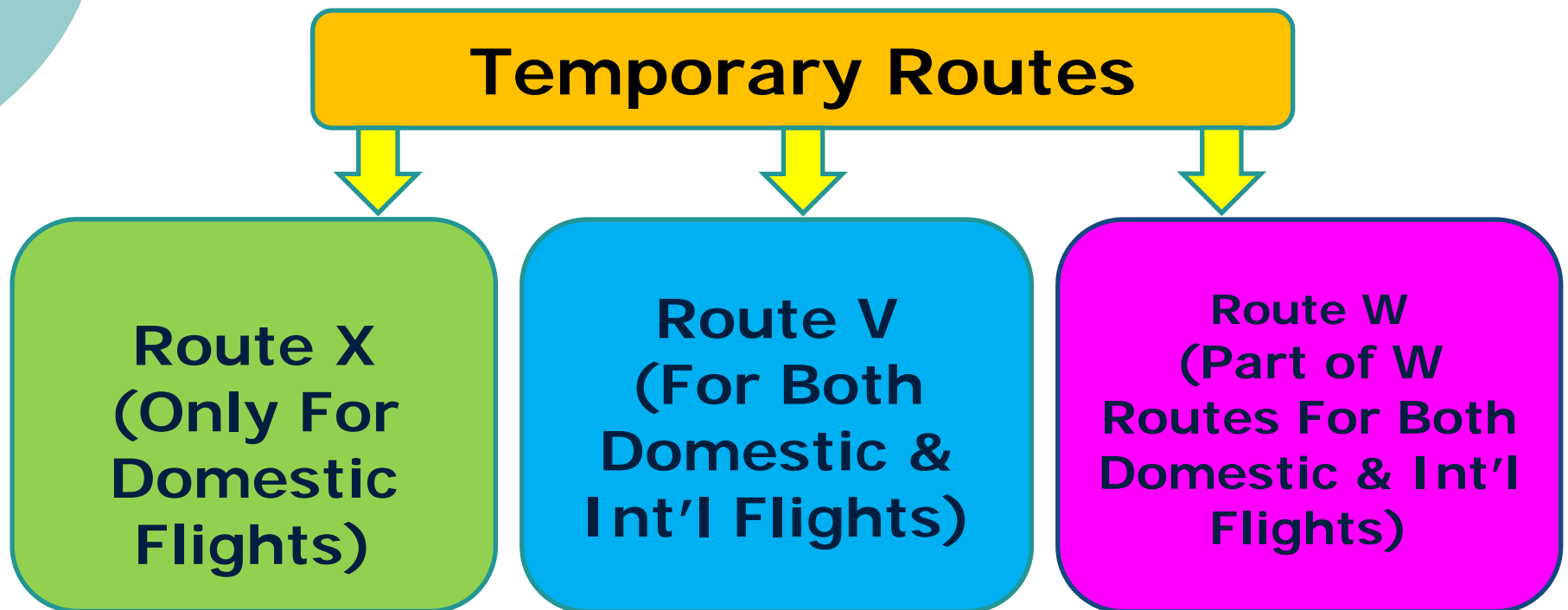


Development of Flexible Use of Airspace in China

- 35 temporary routes established after Olympic Games since March 2009.
- Flight delays reduced by 2% in relevant airports in Pearl River Delta (PRD) area, when V17 and V18 temporary routes open to civil flights particular for the city pairs from PRD to Eastern China.
- Temporary routes are playing a very important role during big events and bad weather.

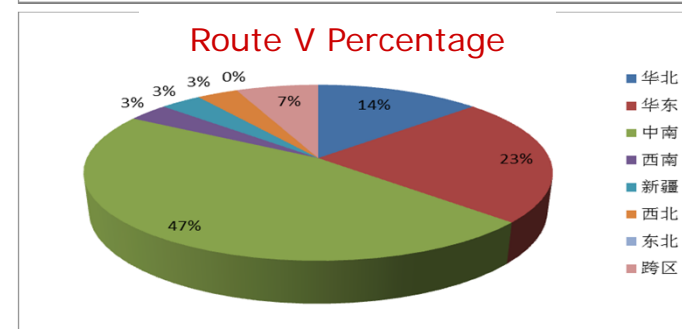
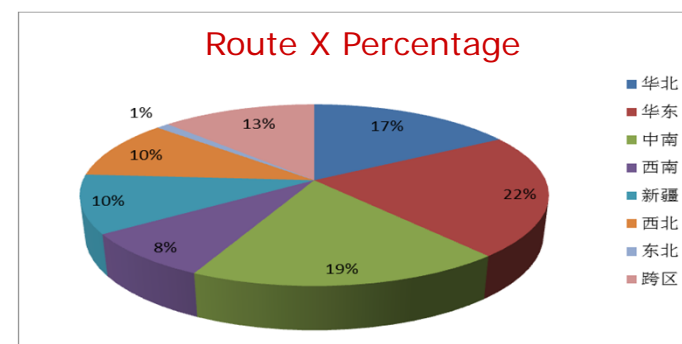
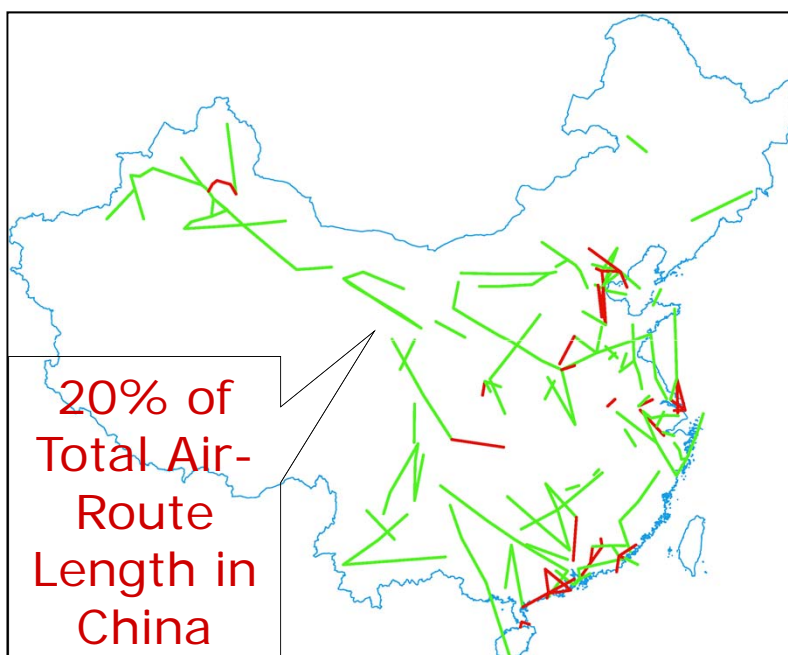
Development of Flexible Use of Airspace in China

- Temporary Routes: shared use of airspace between civil aviation and other users



Development of Flexible Use of Airspace in China

- On Aug. 1st, 2012, active release mechanism of temporary routes established, facilitating the shared and flexible use of temporary routes

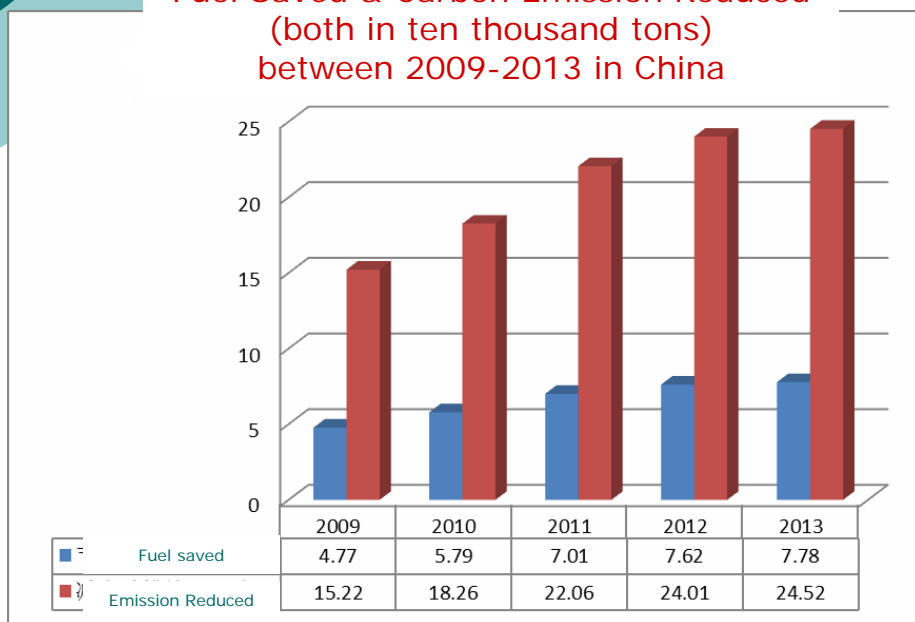


650 routes, of which temporary routes are 130

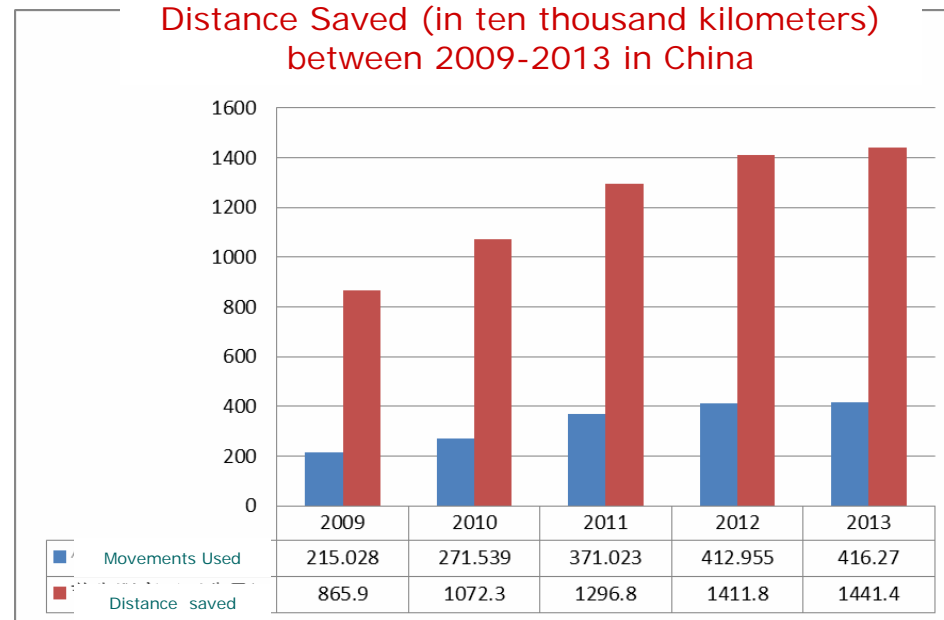
Development of Flexible Use of Airspace in China

Benefits From Use of Temporary Routes

Fuel Saved & Carbon Emission Reduced
(both in ten thousand tons)
between 2009-2013 in China



NO. of Flights involved (in thousand) &
Distance Saved (in ten thousand kilometers)
between 2009-2013 in China



Development of Flexible Use of Airspace in China

**Perception and Understanding
Improvement**

**Problems to
deal with**

**Management Mechanism
Improvement**

**Management Tools
Enhancement**

Future Planning & Prospect of Flexible Use of Airspace in China



Future Planning Prospect of Flexible Use of Airspace in China

Increased Utilization of Temporary Routes

**Where
necessary
and possible**

**Optimized
design**

**Flexible Use
by purpose**

**Integration
with flight
planning**

Future Planning Prospect of Flexible Use of Airspace in China

Increased Utilization of Temporary Routes

**Daytime
Temporary
Route**

**Nighttime
Temporary
Route**

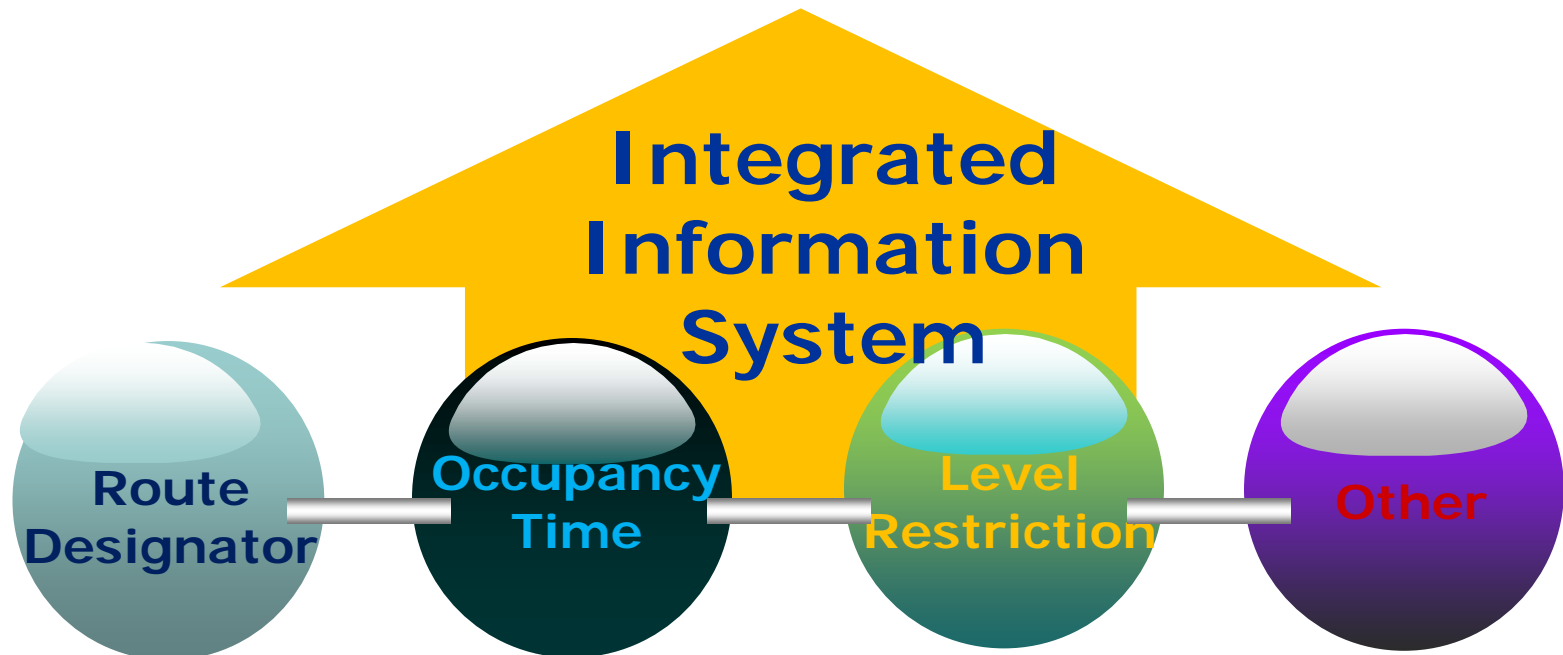
**Weekend
Temporary
Route**

**Holiday
Temporary
Route**

Future Planning Prospect of Flexible Use of Airspace in China

Mechanism of Information Sharing on Use of Temporary Routes

Airspace Users Data Sharing

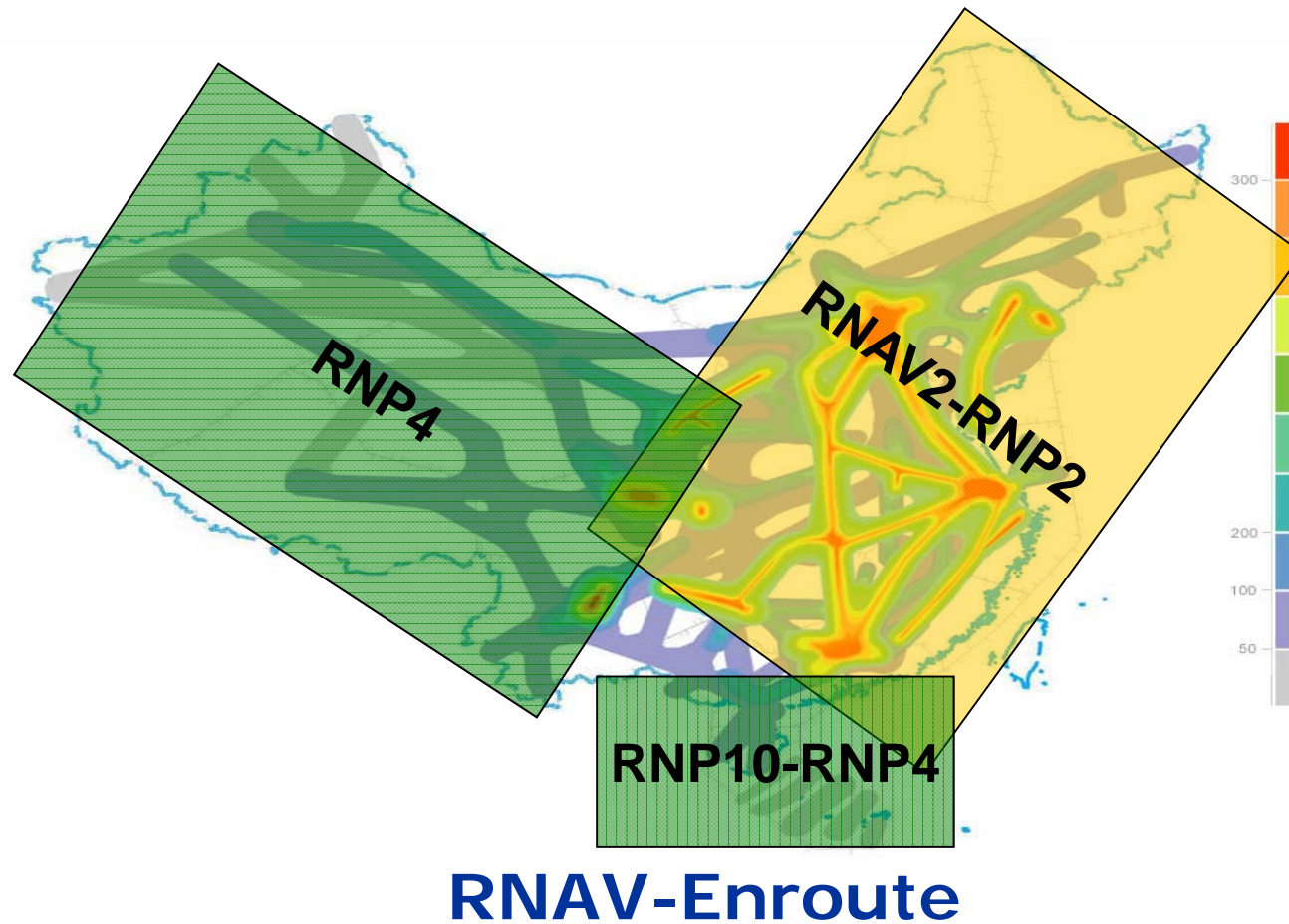


Future Planning Prospect of Flexible Use of Airspace in China



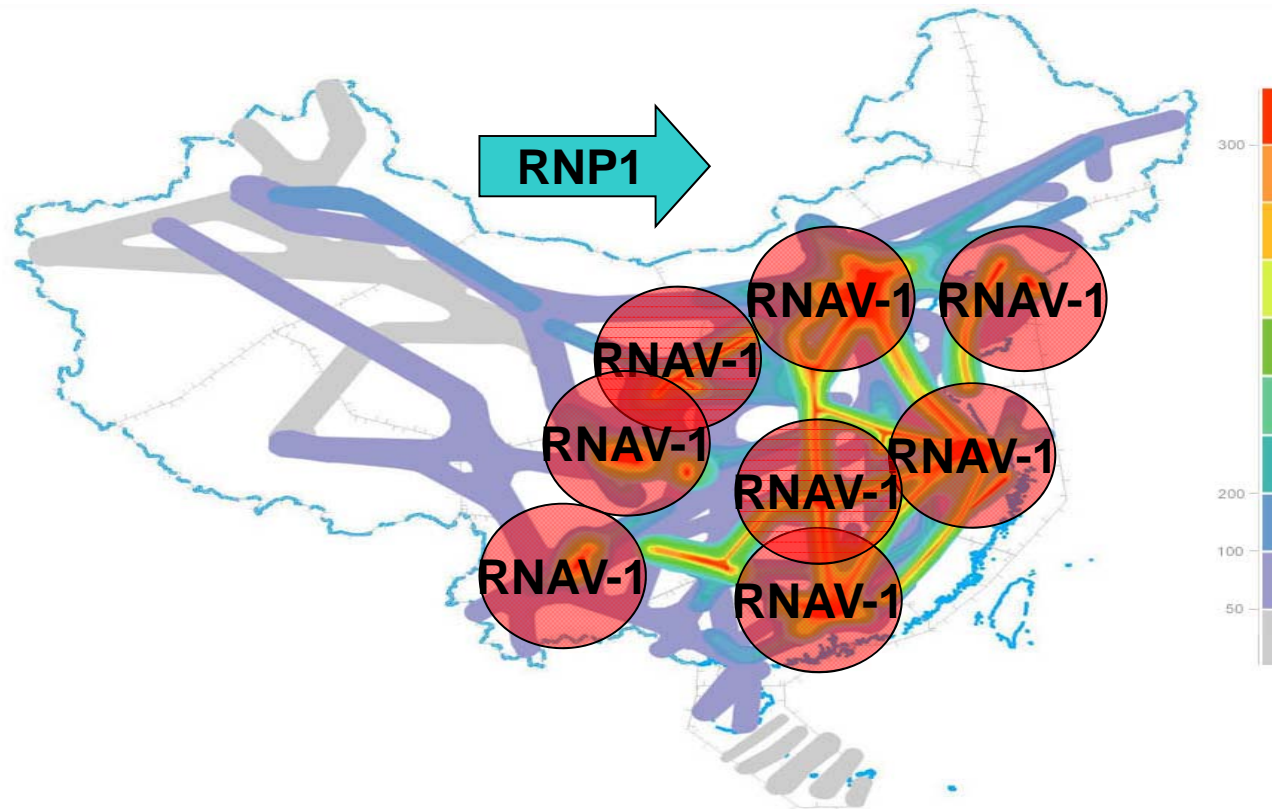
Future Planning Prospect of Flexible Use of Airspace in China

PBN-based Flexible Operation



Future Planning Prospect of Flexible Use of Airspace in China

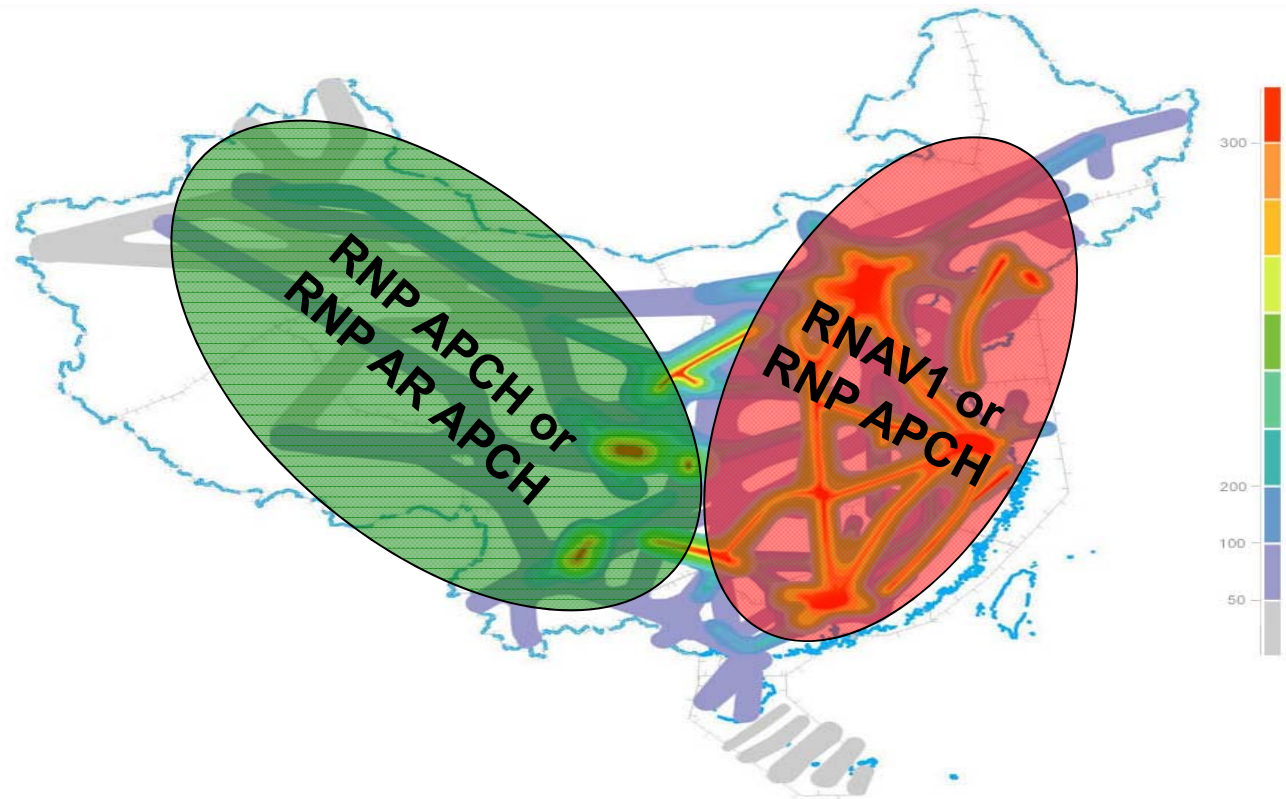
PBN-based Flexible Operation



RNAV-Terminal

Future Planning Prospect of Flexible Use of Airspace in China

PBN-based Flexible Operation



RNAV-Flight Procedure

Future Planning Prospect of Flexible Use of Airspace in China





Thanks!

Any Questions?

