Thinking big

The extraordinary growth of air traffic in China has necessitated an ambitious airspace modernisation programme.

The aims of China’s Civil Aviation ATM Modernization Strategy (CAAMS) are straightforward: strengthen safety and accelerate the development of Chinese airspace management.

Not so straightforward is the sheer scale of the challenge. There are 11 flight information regions covering 10 million square kilometres of airspace. Every day sees 23,000 take-offs and landings. China has 217 certified airports to handle the traffic, 28 of which cater to more than 10 million people annually. In 2016, 480 million people used the country’s air system.

Equally interesting is the rate of growth. In 2005, there were 2.89 million aircraft movements. Just over a decade later that number had ballooned to 8.39 million. By 2020, it will reach 11.5 million. Not surprisingly, around the middle of the next decade, it is predicted that China will overtake the US as the largest aviation market in the world.

The fourth dimension

Mr. Che Jinjun, Director General, Air Traffic Management Bureau (ATMB) of the Civil Aviation Administration of China (CAAC) recognises that handling both the massive volume of traffic and the rate of increase in that volume will be a challenge.

An additional complication is that the three main hubs – Beijing, Shanghai and Guangzhou – together account for one-
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fifth of total traffic. Five-runway configurations at these major gateways, and the complexity of airspace management that implies, may be implemented sooner rather than later.

“There are nearly 2,000 flights in a single day at Beijing despite the airport having just three runways,” he says. “That is comparable to the busiest airports in the world and demonstrates there is already reliable and efficient air traffic management.”

Alongside this, second-tier airports, such as Kunming, Chengdu, Shenzhen and Xi’an, are experiencing phenomenal increases in passenger numbers.

But there is also a wide disparity in the infrastructure and technology base among many Chinese airports and regions. While infrastructure across the country has been steadily improved, in some places, even basic communication equipment is not yet at US or European levels.

The CAAMS has plenty to achieve therefore and, accordingly, contains many different ideas and projects. Airspace organisation and management, collaborative flow management, civil-military cooperation and performance-based services are all on the agenda.

System-wide information management, 4D trajectories, enhanced weather reporting and automatic dependent surveillance – broadcast (ADS-B) technology are also included in an $8 billion aviation investment strategy.

The amount of money, says Mr. Che, “should be a sign of confidence that China is doing what it can.”

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Capacity will need to treble, also compared by 2015, with minimising flight separation a principal driver. Service delays must be shortened to an average of five minutes and an on-time performance record of more than 80% should be achieved by 2020.

In 2016, on-time performance was close to 77%, the best to date but still short of where China wants to be. These gains in operational efficiency will help to cut carbon emissions 10%.

Talent pool

The undertaking is considerable but then so is the platform for success. The goal to provide comprehensive ATC services to air transport has many supporting elements.

The huge population combined with ever improving educational standards means there is excellent pool of talent to draw on in the future. Already, more than 1,000 controllers are certified every year. CAAC also supports about 200 doctorate degrees for management trainees.

“We are building up a professional team, all of whom have proficiency in English,” Mr. Che confirms. “It is not just controllers, but also engineers and every other area of staffing.”

Additionally, years of heavy investment in research and development are bearing fruit. A nationwide ADS-B programme is in progress. The plan is to finish 308 ADS-B ground stations by end 2017 to cover the whole country. Meanwhile, performance-based navigation at major airports is included in the latest five-year plan, which began in 2016. A pilot project looking at a number of new technologies is currently taking place at Guangzhou.

Ground-based augmentation systems, air traffic flow management and collaborative decision making are also starting to take shape at a national level. By 2020, CAAC hopes to expand airspace in the east of the country, optimise traffic flows in the west, straighten routes in the north and regroup traffic in the south.

The Air Traffic Management Bureau is being restructured to help drive these developments. Optimising the administrative aspects will transform the ATMB into a modern, performance-based organisation.

Global contribution

The overarching goal is to have the best airspace management in the region and the world by 2030,” Mr. Che explains. “There are proactive measures to cooperate with all other stakeholders under the leadership of CAAC. We will fulfil the strategy.”

Cooperation is also extending to CANSO, which Mr. Che suggests is a significant move for both parties and for the industry at large. It will allow CAAC to understand and assimilate global practice, while CAAC’s logical yet multifaceted strategy could make a considerable contribution to ATM development.

Not least for both parties is a greater understanding of change management and what it takes to manage airspace safely and efficiently even as air traffic grows.