Summary

China, the world’s second largest aviation market, hopes to build 56 new airports, re-locate 16 airports, and renovate/expand 91 airports during the 2011 – 2015 period. If it does, China will have 220 airports (currently 175), including 3 national hubs, 5 regional hubs, and 24 medium hubs. The commercial air fleet will grow along with the number of airports, up from 3,888 aircraft in 2011 to an estimated 4,500 by 2020.

The increase in the number of airports and aircraft will require new infrastructure, aircraft engines as well as parts, pilots, controllers, communication/navigation/surveillance systems and other equipment presents significant business opportunities for U.S. exporters.

The following report will discuss seven different market segments: airline operations and aircraft, engines and parts, Maintenance/Repair/Overhaul (MRO), airport construction, Air Traffic Control (ATC), General Aviation (GA), and personnel training.

Market Demand

1. Airline Operations and Aircraft

The entire air transport industry of China experienced fast development even under the global economic downturn since 2008. Based on statistical data released by the Statistic Department of the Civil Aviation Administration of China (CAAC). The Chinese air transport industry generated a profit of RMB 556.14 billion ($89.7 billion) in 2012.

Please see below charts for the 2009 – 2012 performances:

<table>
<thead>
<tr>
<th>Year</th>
<th>Total Traffic Throughput (Billion ton km)</th>
<th>Growth rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
<td>42.71</td>
<td>13.40%</td>
</tr>
<tr>
<td>2010</td>
<td>53.85</td>
<td>26.10%</td>
</tr>
<tr>
<td>2011</td>
<td>57.74</td>
<td>7.20%</td>
</tr>
<tr>
<td>2012</td>
<td>61.03</td>
<td>5.70%</td>
</tr>
</tbody>
</table>
2009-2012 Passenger Volume

2009: 231 million, 19.70%
2010: 268 million, 16.10%
2011: 293 million, 9.50%
2012: 319 million, 8.90%

(Source: 2012 CAAC Annual Statistic Communique)

2009-2012 Cargo & Mail Volume

2009: 4.455 million, 9.30%
2010: 5.63 million, 26.40%
2011: 5.575 million, -1%
2012: 5.45 million, 2.20%

Chinese Airlines

The state-owned Airline Group Corporations were established after the reform several years ago: China Southern, China Eastern and Air China. The second tier airlines are Hainan Airline and Shanghai Airline. Private airlines were established quickly in 2005, 2006 and part of 2007,
6 passenger carriers: Spring Airlines, Lucky Air, East Star Airlines, China Express Airlines, United Eagle Airlines, and Junyao Airlines and 3 cargo/mail companies: Shenzhen Donghai Airlines, China Postal Airlines, and Great Wall Airlines.

Spring Airlines is the only new airlines that has been making money: (Unit: USD million)

<table>
<thead>
<tr>
<th>Year</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net profit</td>
<td>4.84</td>
<td>11.29</td>
<td>3.23</td>
<td>2.56</td>
<td>75.8</td>
<td>80</td>
</tr>
</tbody>
</table>

(Source: Spring Airlines Spokesman Mr. Wu An Zhang)

The major players in China are the three state-owned airlines: Air China, China Southern, and China Eastern, which dominate the international routes, domestic trunk air routes, and hub airports. Other new companies have been either acquired by the majors, or going bankruptcy, or struggling in the deficit mud.

The approval of two new private passenger airlines Ruili Airlines and Qingdao Airlines in June of 2013 ended the freeze by the CAAC circular in August of 2007 aimed at slowing down the pace of development in the Chinese civil aviation.

Below is a chart of the market share development of private airlines:

CAAC policy still allows the establishment of cargo airlines, airlines employing foreign pilots, and businesses that use only domestic planes and fly at nighttime. New airlines registered to run in the west or the northeast will also be backed up by the administration. It is also possible to establish charter operations.
Some foreign airlines are continuing to successfully seek cooperation with China’s existing regional airlines; for example, Mesa Air Group and Shenzhen Airlines jointly established a regional airline named Kunpeng Airline, launching its first flight in October, 2007 from Xi’an; in October of 2010, the Chinese National Development and Reform Commission approved the establishment of a cargo joint venture (JV) between Air China and Cathay Pacific. Due to the slowdown of the cargo aviation market, Jade Cargo has stopped operations since Dec. 31, 2011, and been searching for suitable buyers. Shenzhen-based logistic company Uni-Top Group was eventually chosen as the reorganizing party. A Letter of Intent (LOI) on the reorganization was signed in February 2012. Jade Cargo was jointly founded by Shenzhen Airlines, German airline Lufthansa Cargo and German investment company DEG in October 2004. This may be a factor as to why the cargo JV negotiation between Air France/KLM and China Southern Airlines has been suspended.

Chinese Aviation Manufacturing

AVIC I (China Aviation Industry Corporation I) and AVIC II (China Aviation Industry Corporation II) merged as AVIC (China Aviation Industry Corporation) in October of 2008, aiming to concentrate all resources for large commercial aircraft projects.

In May of 2008, China’s first jumbo passenger aircraft company COMAC (Commercial Aircraft Corporation of China Ltd.) was established. COMAC is in charge of large plane assembly, marketing and after-sales service with an initial investment of 19 billion Yuan ($3 billion). It is rumored that Chinese made jumbo C919 will fly into the sky no later than 2016. The large commercial aircraft’s design is completed, production started to ensure the first trial flight in 2014. It is clear that the Chinese intend to have a jet manufacturing business to compete with Boeing and Airbus in the future. The Commission of Science Technology and Industry for National Defense has urged non-state-owned companies to participate in such an undertaking. Private investment and international cooperation continue to be welcome.

**C919**

The 168 seats carrier aircraft was scheduled to finish the design in 2012, to accomplish first trial flight in 2014 and first delivery in 2016. COMAC also plans to fulfill the goal of an annual production of 150 C919 within 20 years. As of August 2013, COMAC has received orders for 380 C919 aircraft.

As evidenced by the chart below, COMAC chose U.S. firms to supply key components and equipment as what had happened to the ARJ 21 aircraft. It will be a long time before the Chinese airplane manufacturer can source the entirety of its components from local makers.

<table>
<thead>
<tr>
<th>System/components</th>
<th>U.S. Suppliers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Composite Materials</td>
<td>Hexcel</td>
</tr>
<tr>
<td>Turbofan Engines</td>
<td>CFM International Inc. (LEAP-X1C engine)</td>
</tr>
<tr>
<td>Component</td>
<td>Manufacturer</td>
</tr>
<tr>
<td>------------------------------------------------</td>
<td>-----------------------</td>
</tr>
<tr>
<td>Engine nacelles and thrust reversers</td>
<td>Nexelle/GE</td>
</tr>
<tr>
<td>Engine exhaust systems</td>
<td>Nexelle/GE</td>
</tr>
<tr>
<td>Automatic Flight Control System (AFCS)</td>
<td>Honeywell</td>
</tr>
<tr>
<td>Auxiliary Power Unit (APU)</td>
<td>Honeywell</td>
</tr>
<tr>
<td>Wheel Brake System</td>
<td>Honeywell</td>
</tr>
<tr>
<td>Air Data &amp; Inertial Reference System (ADIRS)</td>
<td>Honeywell</td>
</tr>
<tr>
<td>Starter-generators</td>
<td>Honeywell</td>
</tr>
<tr>
<td>Hydraulic System</td>
<td>Parker</td>
</tr>
<tr>
<td>Flight Control Actuation System</td>
<td>Parker</td>
</tr>
<tr>
<td>Fuel System</td>
<td>Parker</td>
</tr>
<tr>
<td>Fuel Tank Inerting System</td>
<td>Parker</td>
</tr>
<tr>
<td>Integrated Avionics Processing System (IAPS)</td>
<td>GE</td>
</tr>
<tr>
<td>Onboard Maintenance System</td>
<td>GE</td>
</tr>
<tr>
<td>Flight Data Recording System</td>
<td>GE</td>
</tr>
<tr>
<td>Telecommunication and Navigation System</td>
<td>Rockwell Collins</td>
</tr>
<tr>
<td>Integrated Supervise &amp; Control System</td>
<td>Rockwell Collins</td>
</tr>
<tr>
<td>Engineering System Simulators</td>
<td>Rockwell Collins</td>
</tr>
<tr>
<td>Passenger cabin Entertainment System</td>
<td>Rockwell Collins</td>
</tr>
<tr>
<td>Electric Power Generation &amp; Distribution Systems</td>
<td>Hamilton Sundstrand</td>
</tr>
<tr>
<td>Fire Prevention System</td>
<td>Hamilton Sundstrand</td>
</tr>
<tr>
<td>Oxygen System</td>
<td>Hamilton Sundstrand</td>
</tr>
<tr>
<td>Effluent Disposal System</td>
<td>Zodiac Aerospace</td>
</tr>
<tr>
<td>Lighting System</td>
<td>Goodrich</td>
</tr>
<tr>
<td>Ice Detecting, Windshield, &amp; Rain Removal System</td>
<td>Goodrich</td>
</tr>
<tr>
<td>Control Panel Application (DPA) &amp; Dimmer Control System (DCS)</td>
<td>Eaton</td>
</tr>
<tr>
<td>Fuel and Hydraulic Conveyance System</td>
<td>Eaton</td>
</tr>
<tr>
<td>Integrated Fire and Protection System</td>
<td>Kidde Aerospace &amp; Defense</td>
</tr>
<tr>
<td>High Lift System</td>
<td>Moog</td>
</tr>
<tr>
<td>Composite</td>
<td>Hexcel</td>
</tr>
</tbody>
</table>

Before this large commercial aircraft project, China’s aircraft manufacturing industry already started to manufacture its own regional jet by JV projects including MA 60 serious, ERJ 145, ARJ 21.
MA 60/600/700

The MA60, Powered by the Pratt and Whitney PW-127J turboprop engines, with a maximum speed of 514 km/h and a range of 2,450 km or four hours, was first tested in 1993 and approved in June 2000 for commuter services as its primary role. It has received 122 orders, of which 15 have been delivered to Africa, with Zimbabwe and Zambia among the buyers. The 60-seat MA600, an improved version of the MA60, was 300 kilograms lighter, making it 40 percent more fuel efficient than turbofan-powered aircraft, according to the president of the Xi'an company Meng Xiangkai. The research and development of the 70-seat MA700 is currently also underway with improvements being made in the power system, cabin design and flight capacities. By 2014, China hopes to be able to deliver its own turbo-prop regional jet series of the MA60, MA600, and MA700 catered to different users.

An accident on May 7, 2011 in Indonesia may have cast shadow on MA 60 future market prospects. So far, no reasons are given on why the aircraft was crashed.

ERJ 145

Harbin Embraer Aircraft Industry Co., Ltd. (HEAI) is a joint venture between Embraer and Harbin Aviation Industry (Group) Co., Ltd. and Hafei Aviation Industry Co., Ltd. subsidiaries of AVIC. With a registered capital of 25 million US dollars, Brazilian and Chinese parties hold shares of 51% and 49% respectively. It is the first time that China collaborates by a pattern of joint venture with an advanced foreign civil aircraft manufacturer to assemble ERJ 145 turbofan regional aircraft. The contract of the cooperation was signed in the Great Hall of the People in Beijing in December 2002. Then, January 2003 saw the establishment of the joint venture. Within a year, the first ERJ145 manufactured by the joint venture was rolled out and successfully fulfilled its maiden flight on December 16th.

ERJ145 production was suspended in the second quarter of 2011 due to weak market demand from the Chinese airlines and ARJ 21 can be the primary reason for the closure of ERJ 145. Another reason was the Harbin Aircraft didn’t gain the technology the company wanted as in the past 10 years the Harbin line was merely in a CKD (completely knock down) assembly way of production.

ARJ 21

In fact, the Chinese government has just rolled out its first regional jet ARJ 21 and finished its first flight in November of 2008. The ARJ 21 is another aircraft model manufactured by COMAC.

The ARJ 21 was tested in 2008, the first model came off the production line in December and plans are to have it fully operational by 2009. Happily over half of the airplane’s parts come from the United States such as the avionics system, which is supplied by Rockwell Collins, engine is supplied by GE. At the same time, ARJ’s upgraded model ARJ 21-700 is at design stage. It was reported that 240 orders were placed for ARJ 21 by domestic and overseas customers.
Regarding commercial aircraft fleets’ operating in the Chinese market, Boeing is the largest supplier of aircraft with a 52% market share. Airbus is the second largest with about 46%. According to Boeing’s latest market forecast, China will continue to be the largest market for new commercial airplanes for the next 20 years, with Chinese airlines acquiring 5,260 new planes worth $670 billion. In addition, China will continue to lead growth in all domestic air travel markets with a passenger-kilometer growth rate of 9.4% and international air travel passenger-kilometer growth rate of 7%. Boeing China also sources many portions of their existing aircraft in China.

![China Needs 5,260 Passenger Aircraft 2012-2031](image)

(Source: Boeing Chinese Market Outlook 2013)

With China’s cargo markets leading the global industry, Chinese air carriers will add about 300 cargo airplanes by 2026, so that its total fleet of freighter airplanes will more than quadruple.

According to Boeing’s forecast, China’s demand for cargo aircraft would be 350 (120 new and 230 re-modified) between 2012 – 2013.

Airbus has also been busy in the market, finishing the construction of its first aircraft assembly line outside Europe in Tianjin in April of 2008. The Airbus Tianjin, with an investment of RMB 2 billion ($323 million), is a joint venture of Airbus (51%) and a consortium (49%) of Chinese enterprises including AVIC (Aviation Industry Corporation of China). The A320 assembly line fulfilled the 1st delivery in June of 2009. By May of 2013, 126 aircraft were coming off the Tianjin Airbus assembly line. With the A320 program as a good start, Tianjin is attracting more aerospace companies to Tianjin Binhai New Area Aviation Town.
Boeing versus Airbus in China:

<table>
<thead>
<tr>
<th>Year</th>
<th>Boeing</th>
<th>Airbus</th>
</tr>
</thead>
<tbody>
<tr>
<td>1973</td>
<td>1&lt;sup&gt;st&lt;/sup&gt; delivery of B707 to China</td>
<td>1985 1&lt;sup&gt;st&lt;/sup&gt; A310 delivered to China</td>
</tr>
<tr>
<td></td>
<td>Boeing’s 2 solely invested firms and JVs</td>
<td>Airbus JV</td>
</tr>
<tr>
<td>1980</td>
<td>Boeing China office set up in Beijing</td>
<td>1994 Airbus China Company established in Beijing</td>
</tr>
<tr>
<td>2006</td>
<td>Boeing Shanghai Aviation Services Co. Ltd. (BSAS)</td>
<td>1997 Airbus Training and Support Service Center set up in Beijing</td>
</tr>
<tr>
<td></td>
<td>Note: it is the only foreign controlled aviation JVs in China</td>
<td></td>
</tr>
<tr>
<td>2010</td>
<td>Boeing signed a MOU with PetroChina &amp; National Energy Administration of China on bio fuel cooperation</td>
<td>2005 Airbus Engineering Service Company set up in Beijing</td>
</tr>
<tr>
<td>Other two solely owned</td>
<td>Boeing China Investment Co. Ltd.</td>
<td>2007 Airbus signed an MOU with China's National Development and Reform Commission (NDRC) formalizing its commitment to allocate 5% of A350XWB airframe production to China.</td>
</tr>
<tr>
<td></td>
<td>Shanghai Boeing Traning and Flight Service Center</td>
<td>2008 Airbus Tianjin assembly line put into production</td>
</tr>
<tr>
<td>2 other JVs</td>
<td>Boeing Tianjin Composite Co. Ltd.</td>
<td>2009 AVIC &amp; Airbus Composite Co. Ltd. opened in Harbin</td>
</tr>
<tr>
<td></td>
<td>Xiamen Taeco Aircraft Maintenance Engineering Co. Ltd.</td>
<td>1&lt;sup&gt;st&lt;/sup&gt; A320 came off line in Tianjin in June</td>
</tr>
<tr>
<td></td>
<td>2013 A320 neo line to Tianjin assembly line in negotiation as 2&lt;sup&gt;nd&lt;/sup&gt; phase cooperation</td>
<td></td>
</tr>
</tbody>
</table>
New International Routes

By the end of 2008, routes between U.S. and China reached 16, since then no new routes have been opened. The chart below demonstrates U.S. carriers’ flight destinations:

<table>
<thead>
<tr>
<th>Airlines/code sharing partners</th>
<th>United Airlines/Air China + Shenzhen Airlines</th>
<th>American Airlines/ Hainan Airlines</th>
<th>Delta Airlines/China Southern + China Eastern</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Shanghai – Chicago</td>
<td>Shanghai – Los Angeles</td>
<td>Beijing – Seattle</td>
</tr>
<tr>
<td>2.</td>
<td>Beijing – Chicago</td>
<td>Beijing – Chicago</td>
<td>Shanghai – Detroit</td>
</tr>
<tr>
<td>3.</td>
<td>Shanghai – San Francisco</td>
<td>Beijing – Chicago</td>
<td>Shanghai – Detroit</td>
</tr>
<tr>
<td>4.</td>
<td>Shanghai – Los Angeles</td>
<td>Shanghai - Chigago</td>
<td>Beijing – Detroit</td>
</tr>
<tr>
<td>5.</td>
<td>Beijing – San Francisco</td>
<td></td>
<td>Shanghai - Atlanta</td>
</tr>
</tbody>
</table>

Below is the passenger distribution in 2012:

![2012 U.S. - China Flight Passengers Chart]

2. Engines and Parts

The follow table lists China’s imports from the United States for aircraft and parts in the past three years in USD:

<table>
<thead>
<tr>
<th>HS</th>
<th>Description</th>
<th>2010 /Share %</th>
<th>2011/Share %</th>
<th>2012/share %</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The main users of aircraft engines and parts are the airlines, MRO corporations, foreign joint ventures of aircraft manufacturers, and domestic aircraft manufacturers (see the prospective buyers and suppliers section). AVIC (China Aviation Industry Corporation) is the only and the largest aircraft manufacturing conglomerate in China (see more in the Main Chinese Aircraft Manufacturers section).

The main suppliers of engines and parts are listed under the Key Suppliers section.

Following is the statistic data on the current engine market share in China:

General Electric (GE) 6%
Rolls-Royce (RR) 9%
*International Aero Engines (IAE) 12%
Pratt and Whitney (PW) 13%
*CFM 60%

Source: GE Market Report (2007 - Note: the market share hasn’t been changed much).
* IAE is a joint venture of Pratt and Whitey, Rolls-Royce, MTU, and IHI.
* CFM is a joint venture of General Electric and SNECMA with 50% and 50% shares.

### 3. Maintenance/Repair/Overhaul (MRO)

The top four aero engine maintenance and engineering corporations are:

<table>
<thead>
<tr>
<th>88</th>
<th>Aircraft, Space craft &amp; Parts</th>
<th>5,898,850,139</th>
<th>47.57</th>
<th>5,492,550,119</th>
<th>39.82</th>
<th>7,590,068,708</th>
<th>42.82</th>
</tr>
</thead>
<tbody>
<tr>
<td>8801</td>
<td>Balloons, Gliders, non-powered aircraft</td>
<td>6,425,650</td>
<td>8,097,209</td>
<td>12,624,285</td>
<td>55.91</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8802</td>
<td>Powered aircraft</td>
<td>5,339,322,104</td>
<td>49.05</td>
<td>4,860,421,809</td>
<td>40.86</td>
<td>6,982,634,629</td>
<td>44.18</td>
</tr>
<tr>
<td>8803</td>
<td>Parts</td>
<td>545,076,348</td>
<td>37.68</td>
<td>625,266,286</td>
<td>35.03</td>
<td>589,709,415</td>
<td>33.96</td>
</tr>
<tr>
<td>8804</td>
<td>Parachutes</td>
<td>116,578</td>
<td>58.84</td>
<td>144,664</td>
<td>51.95</td>
<td>186,688</td>
<td>51.02</td>
</tr>
<tr>
<td>8805</td>
<td>Launching gears, parts</td>
<td>14,291,059</td>
<td>21.71</td>
<td>6,666,135</td>
<td>5.95</td>
<td>17,468,816</td>
<td>9.49</td>
</tr>
</tbody>
</table>

The main users of aircraft engines and parts are the airlines, MRO corporations, foreign joint ventures of aircraft manufacturers, and domestic aircraft manufacturers (see the prospective buyers and suppliers section). AVIC (China Aviation Industry Corporation) is the only and the largest aircraft manufacturing conglomerate in China (see more in the Main Chinese Aircraft Manufacturers section).

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Source: GE Market Report (2007 - Note: the market share hasn’t been changed much).
* IAE is a joint venture of Pratt and Whitey, Rolls-Royce, MTU, and IHI.
* CFM is a joint venture of General Electric and SNECMA with 50% and 50% shares.
<table>
<thead>
<tr>
<th>Year</th>
<th>Company Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1999</td>
<td>SNECMA</td>
<td>Sichuan Aircraft Maintenance Co. Ltd. established between Southwestern Airlines (50%) and Snecma/GE (50%) at the Chengdu Shuangliu Airport in 1999. 2010 – the company was renamed Sichuan Services Aero-engine Maintenance Company (SSAMC) and the shares holders changed to be Air China holds 60% and CFM 40%.</td>
</tr>
<tr>
<td>2001</td>
<td>MTU</td>
<td>MTU and China Southern Airlines approved in 2001 to set up MTU Zhuhai, a 50 – 50 JV. In 2003, the first engine was repaired there.</td>
</tr>
<tr>
<td>2005</td>
<td>Shanghai Pratt &amp; Whitney Aircraft Engine Maintenance Company</td>
<td>Shanghai Pratt &amp; Whitney Aircraft Engine Maintenance Company: China Eastern Airlines (CEA) and Pratt &amp; Whitney reached to agreement in 2005 to jointly set up a new world class aircraft CFM56® engine overhaul joint venture. This new joint venture was set up in November of 2007 in Shanghai. CEA holds 51% share of the JV.</td>
</tr>
<tr>
<td>2007</td>
<td>STATCO</td>
<td>STATCO: in December of 2007, Singapore Technologies (ST) and Xiamen Airlines (XMA) agreed to jointly establish an aero engineer MRO in Xiamen - ST Aerospace Technologies (Xiamen) Co. Ltd. (STATCO). In October of 2011, the JV was put into operation. The investment ratio is ST 80% and XMA 20%.</td>
</tr>
</tbody>
</table>

China’s MRO market is estimated to reach $7.3 billion in 2015. According to Aircraft Maintenance and Engineering Corporation (AMECO Beijing) General Manager Mr. Hu Yu Liang, the global MRO business will be increased by 4.4% in the coming decade, however, China’s growth rate is 8% already.

Aircraft maintenance and repair cost account for 10 – 20% of the airlines total cost, therefore, the Chinese airlines will likely increase their participation in the engine and aircraft MRO businesses.

The top aircraft maintenance engineering corporations are (AMECO), the Guangzhou Aircraft Maintenance Engineering Company Limited (GAMECO), and Taikoo (Xiamen) Aircraft Engineering Co. Ltd (TAECO) and new comers are Boeing Shanghai Aviation Services (BSAS) and STARCO between China Eastern Airlines and Singapore Aerospace Technology. More are to come for a share of the lucrative business at the Chinese market.

<table>
<thead>
<tr>
<th>Year</th>
<th>Aircraft MRO Company</th>
</tr>
</thead>
<tbody>
<tr>
<td>1989/8</td>
<td>AMECO is a MRO JV by Air China and Lufthansa joint ventured MRO in Beijing at 60% - 40% investment ratio with cooperation period of 40 years.</td>
</tr>
</tbody>
</table>
1993/7  **TEACO** shareholders are Hong Kong Aircraft Engineering Co. Ltd. (56.55%), Xiamen Airlines (10%), Cathay Pacific Airways (9.09%), Japan Airlines (9.09%), Boeing Commercial Aero Plane Group (9.09%), and others.

2007/10  **BSAS** - Boeing Shanghai Aviation Services Co., Ltd., is a joint venture among Boeing, The Shanghai Airport Authority, and Shanghai Airlines. The Ministry of Commerce of China issued a certificate of approval to the joint venture in early June of 2006, and the Shanghai Bureau of Industry and Commerce granted a business license June 29 of the same year. It's hangar is based at Pudong International Airport in Shanghai. The registered capital for the joint venture is 85 million USD. The Boeing Company is the largest shareholder (60%) of Boeing Shanghai.

2010/3  **STARCO** - Shanghai Technologies Aerospace Company Limited, a China Eastern Airlines (CEA) and Singapore Technology Aerospace JV, set up its first hanger at the Shanghai Pudong Airport March 17, 2010, CEA is the control party with 51% share. CEA penetrating more deeply into the aircraft MRO as well as the aero engine MRO market.

2012/8  Air France Industries spokesman told China News Agency reporters that the company plans to open aircraft and engine repair business in China. It is estimated that 2 facilities will be built in Shanghai and Xi’an respectively. No more details released.

Note: China Eastern acquired Shanghai Airlines and it was reported that the two agreed to maintain separate MRO business to avoid cut-throat competition.

### 4. Airport Construction

The 12th Five Year Plan (2011 – 2015) of the Civil Aviation Administration of China (CAAC) provides for that China will have more than 230 airports by 2015, covering 83% of the population. The five major airport clusters will be:

<table>
<thead>
<tr>
<th>5 Clusters</th>
<th>Leading city</th>
<th>Major airports</th>
</tr>
</thead>
<tbody>
<tr>
<td>Northern China</td>
<td>Beijing</td>
<td>Harbin, Shenyang, Dalian, Tianjin</td>
</tr>
<tr>
<td>Eastern China</td>
<td>Shanghai</td>
<td>Hangzhou, Nanjing, Xiamen, Qingdao</td>
</tr>
<tr>
<td>Central &amp; Southern China</td>
<td>Guangzhou</td>
<td>Wuhan, Shenzhen, Zhengzhou, Changsha, Nanning, Haikou</td>
</tr>
<tr>
<td>Southwestern China</td>
<td>Chengdu</td>
<td>Chongqing, Kunming, Lasha, Guiyang</td>
</tr>
<tr>
<td>Northwestern China</td>
<td>Xi’an</td>
<td>Urumqi, Lanzhou, Yinchuan</td>
</tr>
</tbody>
</table>

According to CAAC Minister Mr. Li Jiaxiang, during the 12th Five Year Plan, 56 new airports are to be built and 16 to be expanded or renovated with investment totaling $68.5 billion. Most of the projects are in the western region of China.

International companies will have opportunities to participate in both the airport design and in the infrastructure construction. Qualified companies may be approved to compete with domestic.
companies, via the bidding process, for design, consultation, surveillance, management, and construction of designated civil airport projects. So far, the Beijing Capital Airport, Shanghai Pudong Airport, Shanghai Hongqiao Airport, Shenzhen Huangtian Airport, and Guangzhou’s new Baiyun Airport are all designed by international companies.

Ground service is another area in which foreign companies can actively participate. Beijing Capital Airport, Guangzhou Baiyun Airport, and Chengdu Shuangliu Airport have all established joint ventures with foreign partners (Singapore, Indonesia and UK) in ground services. Shanghai Airport (Group) Co. Ltd., Shanghai International Airport Co. Ltd., Air China International Co. Ltd. and Cathay Pacific formed a joint venture to provide ground services at both Shanghai Pudong and Hongqiao airports. China Air Oil Supply Corporation (CAOSC) has established many joint ventures with foreign companies to provide air oil supply services.

5. Air Traffic Control (ATC)

ATC has been a crucial barrier hindering the development of Chinese civil aviation. The authorities have started to attach great importance to increasing airport and air-route capacities in high traffic areas.

CAAC began implementing its new airspace Reduced Vertical Separation Minimum (RVSM) system in November 2007 to satisfy the growing demands of the aircraft operations without adding new air routes. By fulfilling RVSM, the number of China’s airspace cruise altitude layers increased to thirteen. This improved the capacity and utilization rate of China’s airspace, promote reduced flight flow and flight delays. Before its implementation, China only used seven altitude layers of airspace, making for a very low use rate for a capital airport.

Insiders estimate that CAAC intends to spend $6.5 billion during the current 12th Five-Year Plan (2011-2015) to improve ATC infrastructure, 2 times more than the investment for the 11th Five Year Period. In addition to the airport expansion projects, other ATC projects will include: build Sanya the 8th Upper Air Traffic Control Area and 27 Lower Air Traffic Control Areas for general aviation airports and helicopter airports in Zhuhai of Guangdong Province, Shaoxing of Zhejiang, and cities in Shandong and Inner Mongolia.

6. General Aviation (GA)

The main GA operations are agriculture, forestry, fishery, medical, search & rescue, mining, scientific experimentation, pilot training, and limited sport and business aviation. Most aircraft suppliers for these specific areas are domestic. The aircraft suppliers for high-end users, like business aviation, pilot training, and flight inspection, are Beechcraft, Hawker, Cessna, Gulf-stream, Cirrus, Bombardier and Dassault.

In November 2010, the State Council and Central Military Commission of China introduced reforms regulating airspace below 10,000 feet. Further reform is likely in the near future. This policy change signals an opportunity for the expansion of China’s nascent general aviation industry. Systemic
bottlenecks include controlled aerospace, numerous procedures for GA aircraft registration, and the lack of GA airport and maintenance bases. Although not easily resolved in a short time, China demand to add more aircraft to its current modest GA fleet of 1,320 aircraft represents great business opportunities for U.S. suppliers. U.S. GA aircraft makers that entered the Chinese market in the 1990s are set to reap the most benefits.

AVIC has spent years working with the world leading helicopter manufacturers to meet the demands of public security, patrolling of pipelines and power lines, harbor pilot transport, emergency rescue, aerial survey and photography.

In March of 2011, CAIGA acquired Cirrus Aircraft. Now final assembly of Cirrus aircraft is done in Zhuhai with all the parts and components shipped from the states. Assembly will be based on sales orders from the Chinese domestic buyers. In November of 2012 at the Zhuhai Airshow, CAIGA Cirrus signed contracts to sell 60 Cirrus aircraft with a delivery time of 3 years.

In addition to Cirrus, at the 2012 Zhuhai Airshow, Bell sold 16 helicopters. Cessna signed agreements to set up another two joint ventures with the AVIC subsidiary - CAIGA (China Aviation Industry General Aircraft Co. Ltd.) to produce Citation XLS+ business jets and Cessna Caravan utility turboprops jets respectively in Zhuhai and Shijiangzhuang. The earlier JV was the Shenyang Aircraft (AVIC I) and Cessna Aircraft established a joint venture to manufacture and assemble the Model 162 SkyCatcher light sport aircraft in China at the end of 2007; deliveries to the United States are expected to begin in 2009. By the end of 2012, 300 SkyCatchers were delivered and the one aircraft per day production capability was achieved.

7. Training Personnel

Facing the rapid development of civil aviation, China is experiencing a dramatic shortage in pilots, mechanics, inspectors, air traffic controllers and maintenance engineers. Currently, seven domestic universities are authorized to train pilots, and three are authorized for controller training. Also, China Southern Airlines has established a flight college in Australia and Airbus has set up a simulator training center in Beijing.

CAAC estimates that during the 12th Five Year Plan period (2011-2015) Chinese aviation industry needs additional 16,500 pilots, 50,000 mechanics, and 4,000 air traffic controllers.

In March of 2012, the 2 million Euro pilot and air traffic controller training course kicked off, this was a EU sponsored program to be performed in China and France.

Best Prospects

China is regarded as the fastest growing aviation market in the world and its general aviation industry is predicted to grow at an annual average rate of 19% until 2020. The Central Government has already shown a strong demand for general aviation aircraft in areas such as Public Security, Rescue & Salvage, Agriculture, Forestry, Firefighting, Meteorology, Surveying & Mapping, Sports, Tourism and Business Aviation industry. China is estimated to require 1,000 new general aviation aircraft during the 2012 – 2015 period.
According to CAAC’s 12th five-year plan, favorable policies will be given to stimulate regional and general aviation, focusing primarily on regional development in the near term and general aviation. Furthermore, CAAC has ended the freeze over new airlines establishments. This liberalization enables more small, privately-owned and joint-venture airlines to compete with the three biggest airlines.

**Prospective Buyers and Key Suppliers**

**Aircraft Prospective Buyers**
The main buyers of commercial aircraft are the three state-owned airline holding groups, and a few private airlines, which are listed in the Engines and Parts Prospective Buyers below. Forecasts suggest that COMAC will be the main domestic supplier of regional jets.

**Engines and Parts Prospective Buyers**
The main buyers of engines and parts are airlines, MRO centers and domestic aircraft manufacturers.

**Chinese Airlines**
China National Air Holding Group  
China Eastern Air Holding Group  
China Southern Air Holding Group  
Hainan Airline Shanghai Airline  
Xiamen Airline Huaxia Airline  
Shenzhen Airlines

**Major Private/JV Airlines**
Spring Airlines  
Lucky Air  
China Express Airlines  
United Eagle Airlines  
Juneyao Airlines  
Okay Airline  
Gold Deer Airlines (Business Jet Service)  
Kunpeng Airlines (JV between Shenzhen Airlines 51% & Mesa Air of USA)

**Major Cargo/mail companies**
Shenzhen Donghai Airlines  
China Postal Airlines  
Great Wall Airlines  
Shunfeng Express  
Rainbow International Cargo Co. Ltd.  
Yangtze River Express

**Aircraft MROs**
AMECO Beijing--Aircraft Maintenance and Engineering Corporation  
GAMECO--Guangzhou Aircraft Maintenance and Engineering Corporation  
TAECO – Taikoo (Xiamen) Aircraft Engineering Co. Ltd.
BSAS- Boeing Shanghai Aviation Services
STARCO – Shanghai Technologies Aerospace Company Limited

**Aero Engine MROs**
MTU Zhuhai
SSAMC – Sichuan Services Aero-Engine Maintenance Company
Shanghai Pratt & Whitney
STATCO - ST Aerospace Technologies (Xiamen) Co. Ltd.

**Main Chinese Aircraft Manufacturers**
AVIC (China Aviation Aviation Corporation)
COMAC (Commercial Aircraft Corporation of China)
CAIGA (China Aviation Industry General Aviation Company)
Xi’an Aircraft Industry Co., Ltd.
Xi’an Aero Engine Company
Shenyang Aircraft Industry Co., Ltd.
Shenyang Aero Engine Corporation
Chengdu Aircraft Industry Co. Ltd.
Chengdu Aero Engine Corporation
Harbin Aircraft Manufacturing Corporation
Shijiazhuang Aircraft Industry Co., Ltd.
Hongdu Aviation Industry Corporation
Changhe Aircraft Industries Corporation

**Key Suppliers of aircraft parts:**
CFM      Messier Dorty (France)
PW      SNECMA (France)
RR      TIMKEN
IAE      BF
UTC/Goodrich  GE
Rockwell Collins  Thales
Honeywell

**ATC Prospective Buyers**
Communication/Navigation/Surveillance equipment and system prospective buyers are ATMB of CAAC, and regional ATMBs to expand the capacity, ATMB has planned to apply new technologies, such as the RNP/RNAV, RVSM, ADS-B. FAA and Boeing and FAA have been collaborating with ATMB on these programs.

**ATC Equipment and System Providers**
ACCs: Thales - Three out of the seven existing ACCs were built by Thales, which is trying to acquire additional contracts for the up-coming ACCs.

**ATC Radars:**
Thales (French)
Eurocat
Raytheon International, Inc. (American)
Selex System (Italian)
Telephonics (American)

VOR/DME:
AWA (Australia)
Thales (France)
Alcart

ILS:
Normark (Europe)
Wilcox
Airsys
Alcart

Hughes is the main supplier for Satellite Communication System; and Rockwell Collins is one of the main suppliers of HF ground radio station.

Market Entry

Generally speaking, the civil aviation industry is highly supervised by the Chinese government. According to the Notification on Foreign Investment to China Civil Aviation, the maximum foreign investment in Chinese airlines is capped at 35%; with foreign investment in the airport or terminal operation capped at 49%. Foreign airlines, with operating rights in China, are able to carry out sales via sales agents or through their own companies. Foreign leasing companies are allowed to provide dry lease services through cross-border supply and consumption abroad. Foreign companies are also allowed to establish dry-lease joint ventures in China. The following are necessary certifications in order to operate in China’s civil aviation sector.

For large scale commercial carriers, applicants need to follow the China Civil Aviation Regulation (CCAR)—Part 121 to obtain a certification to operate in China. In order for small scale commercial carriers to obtain an operating certificate, they need to follow CCAR 135. In regards to MRO, domestic companies with joint ventures need to follow CCAR- part145 in order to apply for the Maintenance Authorization Certificate. For pilot training, international and domestic organizations need to follow CCAR-Part 141 to apply for the certification of a Pilot Training School and Part 142 to apply for Flight Training certification.

In accordance with the U.S./People’s Republic of China Bilateral Airworthiness Agreement and the associated Schedule of Implementation Procedures, airworthiness certification of aeronautical products is reciprocally accepted. AC212-Appendix 2 (see in FAA’s website) which is a document issued by FAA prescribing the special requirements applicable to products exported from the United States to China, must be satisfied at the time of export for a particular product. It also contains useful information for U.S. manufacturers before a product can enter into service in China.

Chinese Airworthiness Authority
The responsibility for controlling flight safety of civil aviation in China is a task of the Civil Aviation Administration of China (Here in after referred to as CAAC). The Aircraft Airworthiness Certification Department (AAD) of CAAC is responsible for certification of civil aviation products.

More Information

For More information on market access policies and application procedures, please visit the website of the civil aviation authorities of U.S and China: www.faa.gov.

Market Issues & Obstacles

European Union companies are the main competitors of U.S. aircraft-related exporters. China is aggressively seeking new technology and many manufacturers from the European Union countries have promised technology transfers in their negotiations. Technology transfer usually serves as an advantage in obtaining a contract from the Chinese government.

There are several other obstacles to doing business in China. Laws and regulations are not as transparent as that of developed countries. Industry is often not given sufficient opportunities to fully express their opinions when law or regulations are being drafted.

For more information, the American Chamber of Commerce in Beijing issues an annual White Paper on the aviation market in China.

Trade Events in China

Aviation Expo / China 2013
25-28 September 2013
China International Exhibition Center, Beijing
MRO Expo China
October 16 – 18, 2013, Xiamen, Fujian Province
http://www.mroexpochina.com/Default/EnIndex


The 2013 Shanghai International Airport Exhibition of Technology, Equipment and Services
November 5 – 9, 2013, Shanghai
http://www.shhkexpo.cn/index.html

Asian Business Aviation Conference & Exhibition
April 15–17, 2014, Shanghai
http://www.nbaa.org/events/name/

Zhuhai Airshow
November 11-16, 2014
Zhuhai, Guangdong Province
http://www.airshow.com.cn/

Resources & Contacts

Let us help you export.
The U.S. Commercial Service — Your global business partner.
export.gov
800-USA-TRADE
The U.S. Trade Development Agency (USTDA) has as its mission to advance economic development and U.S. commercial interests in developing and middle-income countries. To this end, the agency funds various forms of technical assistance, investment analysis, training, orientation visits and business workshops that support the development of a modern infrastructure and a fair and open trading environment. In carrying out its mission, USTDA gives emphasis to economic sectors that may benefit from U.S. exports of goods and services. For more information, please visit: www.ustda.gov.

The main result of USTDA's work in the aviation sector in China is the U.S.-China Aviation Cooperation Program (ACP), which is located in Beijing, and is committed to working with the General Administration of Civil Aviation of China (CAAC) and Chinese aviation experts to develop and operate safe, efficient aviation infrastructures. This is an innovative public-private initiative, which enhances friendship and partnership, and promotes bilateral trade relations between the U.S. and China. Currently, there are four American public members and 24 American corporate members. For more information, please visit: www.uschinaacp.com.

The American Chamber of Commerce in the People's Republic of China (AmCham-China) represents U.S. companies and individuals doing business in China. AmCham-China's membership comprises more than 3,500 individuals from more than 1,000 companies. It has more than 20 industry and issue-specific forums and committees, offering services such as the Business Visa Program, networking and informational events, and meetings with US and Chinese officials to discuss challenges facing US firms doing business in China. For more information, please visit: www.amcham-china.org.

The United States-China Business Council, Inc. (USCBC) is a private, non-profit, non-partisan, member-supported organization. Founded in 1973 as the National Council for US-China Trade, USCBC originally served the early efforts of US businesses in China in the absence of formal diplomatic relations between the two nations. While USCBC assists firms entering the market for the first time, the bulk of its work today serves the interests and needs of U.S. firms with well-established commercial relationships in China. Headquartered in Washington, DC, USCBC also serves its corporate members from field offices in Beijing and Shanghai. For more information, please visit: https://www.uschina.org.

Other websites:
CAAC: www.caac.gov.cn
Air Traffic Management Bureau: www.atmb.net.cn
Center of Aviation Safety Technology: www.castc.org.cn
AVIC: www.avic.com.cn
COMAC: http://www.comac.cc/
CAIGA: http://www.caiga.cn/a/wangzhanyingwen/

For More Information:
Please contact the Commercial Service China Aviation Team as below:

Ida Peng, Senior Commercial Specialist
U.S. Embassy, Commercial Section
Tel: (86-10) 8531-3947 Fax: (8610) 8531-4343
E-mail: aiquin.peng@trade.gov Website: www.buyusa.gov/china/en/

Vivien Bao, Senior Commercial Specialist
U.S. Consulate General in Shanghai
Tel: 86-21-6279 8766 Fax: 86-21-6279 7639
Email: vivien.bao@trade.gov Website: www.buyusa.gov/china

Shiyang Cui, Senior Commercial Specialist
U.S. Consulate General in Chengdu
Tel: 86 28- 8598 6546 Fax: 86 28-8558 9221
Email: shiyang.cui@trade.gov Website: www.buyusa.gov/china

Lena Yang, Senior Commercial Specialist
U.S. Consulate General in Guangzhou,
Phone: (86-20) 3814-5173 Fax: (86-20) 3814-5353
Email: lena.yang@trade.gov Website: www.buyusa.gov/china

Appendix 1

<table>
<thead>
<tr>
<th>Projects</th>
<th>Airport names</th>
</tr>
</thead>
<tbody>
<tr>
<td>Airport Expansion Projects</td>
<td>Harbin, Changchun, Shenyang, Dalian, Tianjin, Shijiazhuang,</td>
</tr>
<tr>
<td></td>
<td>Tangshan, Huhehaote, Baotou, Jinan, Weihai, Shanghai Pudong,</td>
</tr>
<tr>
<td></td>
<td>Shanghai Hongqiao, Nanjing, Hangzhou, Fuzhou, Xiamen, Nanchang,</td>
</tr>
<tr>
<td></td>
<td>Zhengzhou, Luoyang, Wuhan, Yichang, Changsha, Changde,</td>
</tr>
<tr>
<td></td>
<td>Guangzhou, Shenzhen, Foshan, Zhanjiang, Nanning, Gulin, Haikou, Sanya,</td>
</tr>
<tr>
<td></td>
<td>Chongqing, Chengdu, Guiyang, Lijiang, Xishuangbanna, Lasha, Xi’an, Yinchuan,</td>
</tr>
<tr>
<td></td>
<td>Lanzhou, Dunhuang, Urumqi</td>
</tr>
<tr>
<td>Airport Relocation Project</td>
<td>Qinghuangdao, Wuzhou, Yibin, Yan’an</td>
</tr>
<tr>
<td>New Airport Projects</td>
<td>Zhangjiakou, Putian, Hengyang, Shaoguan, Yueyang, Qionghai, Xinyang, Shangqiu</td>
</tr>
<tr>
<td>Pre-feasibility study airport projects</td>
<td>New Dalian Airport, New Qingdao Airport, New Xiamen Airport, New Chengdu</td>
</tr>
</tbody>
</table>
China

Capital: Beijing
Population: 1.33 billion
GDP*: 8,223 trillion
Currency: Chinese Yuan (CNY)
Language: Mandarin Chinese

Aircraft, Spacecraft, and related parts (HS Code 88)  Unit: USD millions

<table>
<thead>
<tr>
<th>Year</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2030 (est.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Imports</td>
<td>12,399.43</td>
<td>13,793.53</td>
<td>17,726.84</td>
<td></td>
</tr>
<tr>
<td>Imports from the U.S.</td>
<td>5,898.85</td>
<td>5,492.55</td>
<td>7,590.07</td>
<td></td>
</tr>
<tr>
<td>US share of total imports</td>
<td>47.57</td>
<td>39.82</td>
<td>42.82</td>
<td></td>
</tr>
<tr>
<td>Forecast demand: # of new aircraft</td>
<td></td>
<td></td>
<td></td>
<td>5,260 aircraft</td>
</tr>
<tr>
<td>Forecast demand: Import Value</td>
<td></td>
<td></td>
<td></td>
<td>$550,000 (remainder manufactured locally)</td>
</tr>
<tr>
<td>Exchange Rate: 1 USD</td>
<td>6.7703</td>
<td>6.4615</td>
<td>6.3123</td>
<td></td>
</tr>
</tbody>
</table>

Data Sources: Global Trade Atlas, Boeing CMO, Economist Intelligence Unit, internal analysis

China is one of the world’s fastest growing civil aviation markets. The industry has grown at double-digit rates for several years. Industry forecasts expect growth to remain strong over the medium term, averaging 7% over the next 20 years. In order to keep pace with demand, China is forecast to require 5,260 new aircraft valued at $670 billion over the next 20 years. Most of these will be single-aisle aircraft designed for short-haul domestic travel. Commercial opportunities in the civil aviation market include final assembly and tier-one suppliers, small niche parts manufacturers, airport design and construction companies, and general aviation among others.

Market Entry

U.S. firms without an existing China presence may want to consider hiring a local distributor or representative. This partner generally helps establish access to decision makers and gain timely
commercial information about your market. They also traditionally leverage personal connections to promote the U.S. product, and develop sales leads. While this is a common global practice, successful exporters comment on the need to invest significant time and attention to maintaining and managing relationships with Chinese partners. Some U.S. firms decide to enter into a Joint Venture (JV) relationship with Chinese partners, exchanging technological know-how for market access. This should only be done after significant due-diligence and cost/benefit analysis.

US firms often use training programs to establish productive partnerships with Chinese clients. Industry associations such as the US-China Aviation Cooperation Program (ACP) can serve as valuable vehicles for smaller firms to leverage similar opportunities.

### Aircraft Parts: Manufacture and Repair

<table>
<thead>
<tr>
<th>Aircraft parts (HS Code 8803)</th>
<th>Unit: USD millions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2010</td>
</tr>
<tr>
<td>Total Imports</td>
<td>1,446.46</td>
</tr>
<tr>
<td>Imports from the U.S.</td>
<td>545.08</td>
</tr>
<tr>
<td>% US Imports</td>
<td>37.68</td>
</tr>
</tbody>
</table>

Data Sources: Global Trade Atlas

China’s import market for aircraft parts and components exceeded $1.7 billion in 2011 and 2012, an increase of over 21% compared with year 2010. China’s demand for aircraft parts can be attributed to a number of factors including an increasing capacity utilization rate, the age and expansion of China’s aircraft fleet, and the domestic production and assembly of aircraft.

There are 1,745 registered commercial transport aircraft in China with an average age of five years, and as the fleet continues to age, it will require parts and equipment for routine maintenance and repair. Though there are a number of major domestic aircraft and parts manufacturers scattered throughout China, the sector is still underdeveloped, creating a strong demand for reliable imported products and technologies to ensure quality standards.

China’s domestic aircraft part and assembly manufacturing sector is also growing. In addition to approximately 200 small aircraft parts manufacturers, there are also a number of regionally-based major manufacturers concentrated in Shanghai, Chengdu, Xi’an, Jiangxi and Shenyang. China’s domestic manufacturing base is developing, as reflected by the commitments of large aircraft and engine manufactures to expand procurement in China over the long term. However, most highly technical and sophisticated parts and assemblies will continue to be imported until production quality meets international standards. At the present time, domestic manufacturers do not have the ability to produce all of the qualified materials and parts.

### Airports

China currently has 178 civil aviation airports, including the world’s second busiest in Beijing, with plans to expand aggressively to 244 by 2020. The government announced plans to invest $64 billion to build and improve 97 airports by 2021, including 78 green field projects and a new $15 billion international airport in Beijing. The expansion will place 80% of China’s population and 96% of its GDP within 100 kilometers (roughly 60 miles) of the nearest airport, greatly enhancing the potential for aviation growth.

The airport system at present is highly concentrated, with top airports suffering from major congestion. The top three airports, Beijing, Shanghai and Guangzhou, account for 1/3 of all traffic, while the top 14 airports handle 2/3 of total traffic nationwide. Local industry estimates indicate that 40 of China’s airports
are already at or near capacity, with another 29 expected to reach this limit within the next two years. To relieve congestion, China opened 19 new airports over two years from 2009-2011.

International companies will have opportunities to participate in both the airport design and in the infrastructure construction. Qualified companies can bid for design, consultation, surveillance, management, and construction of designated civil airport projects. However, the chances for international leading design and construction companies to win the bid are limited, unless partnering with qualified Chinese domestic design and construction companies. So far, the Beijing Capital Airport, Shanghai Pudong Airport, Shanghai Hongqiao Airport, Shenzhen Huangtian Airport, and Guangzhou’s new Baiyun Airport are all designed by international companies with local Chinese partners.

Ground service is another area in which foreign companies can actively participate. Beijing Capital Airport, Guangzhou Baiyun Airport, and Chengdu Shuangliu Airport have all established joint ventures with foreign partners (Singapore, Indonesia and UK) in ground services. Shanghai Airport Ground cooperated with Cargo Warehouse and Lufthansa set up a joint venture. China Air Oil Supply Corporation (CAOSC) has established many joint ventures with foreign companies to provide air oil supply services.

**General Aviation (GA)**

In China, the airspace is tightly controlled by the Chinese military and the airspace class system does not segment out its GA air activities. Strict military control over roughly 70% of all Chinese airspace is the largest single factor limiting growth of this industry. GA is still underdeveloped in China regarding GA aircraft numbers, GA professionals and GA facilities.

However, a welcome change came in November 2010 when civilian and military authorities issued a joint reform document calling for liberalization of low altitude airspace under 4,000 meters (13,000 feet). Implementation of the reform will roll out in three stages, starting with an Experimental Phase in Guangzhou and Shenyang. The policy outlines a national rollout by 2015, and a final deepening and consolidation by 2020. Since then, GA develops with fast speed with new players coming to this market and the more involvement of local governments. GA has big potential market driven by the state and local economy development plan, the public demand for business jet, and the need for public services and individual recreations.

China currently has 123 operators registered with the Civil Aviation Administration of China (CAAC), the main stakeholder formulating policies and regulations concerning the safety and economics of GA in China. However, about 80% Chinese operators have only 2 or 3 aircrafts thus struggle to achieve operating scale and profitability. In addition, GA aircraft is very costly to use in China due to airspace access, flight approval procedures, and operation charges such as airport charges, plus maintenance services. All of these factors contribute to low profitability for Chinese operators.

GA deregulation will accelerate in the following 3-5 years. China is gradually opening its low altitude airspace, which will trigger the booming of this industry. According to CAAC’s official source, the GA aircrafts’ operation hours will increase to 300,000 hours in 2015 from the current 140,000 hours, with an annual growth rate of 16%. The GA fleet size will reach over 2,000 GA aircrafts in 2015 from the current 1010 GA aircrafts.

**Competitors**

The size and growth of China’s market has attracted nearly all major international manufacturers and service companies. Traditionally, domestic Chinese firms cannot match foreign technology and compete only on price and network (access to decision makers). Joint venture programs and aggressive R&D investment is narrowing this gap in certain product categories. Still, China’s share of the world export market for commercial aviation products was only slightly more than 1% in 2011.
The Chinese face three key challenges that threaten to limit the industry’s growth: inadequate infrastructure, overly restrictive airspace, and limited skilled human resources. In response to over-congestion at its largest airports, China announced plans to invest $64 billion for construction of 97 new airports by 2021. Then in November 2010, Chinese military and civilian authorities issued a joint statement outlining liberalization of airspace under 4000 meters (13,000 feet) by 2020. Personnel training and capacity building are a priority for regulators, airlines, airport operators and manufacturers. In addition, U.S. firms without a significant on-the ground presence often face additional challenges building relationships, obtaining timely market information, and gaining access to decision makers.

5th China Commercial Aircraft Summit 2013
Date: Apr.24-25, 2013
Venue: Intercontinental Pudong Shanghai China
Contact: Echo Sun, Marketing Manager
Tel: +86 21 5058 9600 ext. 8012
Fax: +86 21 5058 5987
Email:aero@opplandcorp.com
Email: echos@opplandcorp.com
Website: http://www.opplandcorp.com/aero/index.htm
Description: 5th year, gathers 200+ Chinese and international aerospace companies for pre-scheduled B2B meetings

Singapore Air show
Date: Feb. 11-16, 2014
Venue: Changi Exhibition Center Singapore
Organizer: Experia Events Pte. Ltd
Tel: +65 65428660
Fax.:+65 65466062
Contact Person: Mr. Danny Soong
E-mail: sales@singaporeairshow.com.sg
http://www.yoursingapore.com
Description: Asia’s Largest Aerospace & Defence Event seeks to create opportunities for aerospace industry representatives to do business, explore the latest innovations and exchange ideas

China Civil Aviation Development Forum
Date: May16-17, 2013
Venue: China World Trade Center, Beijing
Organizer: Civil Aviation Authority of China (CAAC)
Contact: Richard Wang, Sales Manager
Tel: +86-10- 5825-0412
Fax: +86-10- 64720514
Email: caacforum@camic.cn; info@ccadf.cn; reg@ccadf.cn
Website: http://www.ccadf.cn/ccadfEN/indexen.htm
Description: The only aviation event organized by the CAAC, China’s largest business & policy event focused exclusively on commercial aviation

7th AvioniChina (China International Conference & Exhibition on Avionics & Testing Equipment)
Date: October 17-19, 2013
Venue: Xi’an Qujiang International Conference and & Exhibition Center
Organizer: Grace Fair International Ltd.
Contact: Mr. Jasper Shi, Director Overseas Marketing
Tel: +86-10-6439-0338
Email: jasper@gracefair.com
Website: www.avionichina.com
Description: Avionics products, system and test equipment technology and infrastructure

MRO Expo China 2013
Date: October 16-18, 2013
Venue: Xiamen International Conference & Exhibition Center
Organizer: China Aviation Publishing & Media Co., Ltd. (CAPMC)
Tel: +86-10-8567 2772 / 2566
Fax: +86-10-6567 9059
E-Mail: acul@mroexpochina.com
Website: http://www.aviationmrochina.com/
Description: aims to strengthen international communication and cooperation and serves as a high-level platform for businesses and clients to share their achievements in aviation maintenance.

Air Show China 2014
Date: Nov. 11-16, 2012
Fax: +86-756-337-6415
E-mail: zhuai@airshow.com.cn
Website: http://www.airshow.com.cn/en/
Description: China International Aviation & Aerospace Exhibition (Airshow China or Zhuhai Airshow) is the only international aerospace trade show in China endorsed by the Chinese central government. It features the display of real-size products, trade talks, technological exchange and flying display.

Government Authorities
Civil Aviation Administration of China (CAAC), www.caac.gov.cn
Air Traffic Management Bureau: http://www.atmb.net.cn
Center of Aviation Safety Technology: http://www.castc.org.cn/

Airlines
Air China, www.airchina.com.cn
China Eastern Airlines, www.ce-air.com
China Southern Airlines, www.cs-air.com
Shanghai Airlines, www.shanghai-air.com
Spring Airlines, www.air-spring.com

Aircraft Manufacturers
Aviation Industry Corporation of China (AVIC), http://www.avic.com.cn
Commercial Aircraft Corporation of China (COMAC), http://www.comac.cc/

MRO Facilities
Aircraft Maintenance and Engineering Corporation (AMECO), www.ameco.com.cn
Shanghai Technologies Aerospace Co. (STARCO), http://www.staero.aero/starco.html
Guangzhou Aircraft Maintenance Engineering Co. (GAMECO), www.gameco.com.cn
Taikoo Aircraft Engineering Company Limited (TAECO), www.taeco.com
MTU Maintenance (Zhuhai), www.mtu-zhuhai.com
GE Engine Services (Xiamen)
Sichuan Snecma Aero Engine Maintenance Company Ltd. (SSAMC), www.snecma.com

Aircraft Trading Companies
China Aviation Supplies Corporation (CASC), www.casc.com.cn
Other
CAAC news: http://www.caacnews.com.cn/ (in Mandarin)
Civil aviation industry analysis report:
http://www.ocn.com.cn/reports/2006084minyonghangkong.htm (in Mandarin)

### Available Market Research

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Fax: 86 28 86689221
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Note: This article describes the safety of China’s commercial aviation sector, but points out the mounting flight delays and passenger frustration with the situation.

*The Economist*
Aug. 10, 2013

**Crowded skies, frustrated passengers**

**Military control of airspace and a risk-averse culture threaten to cripple China’s rapid growth in aviation**

On an average day, more than 1,500 planes take off and land at Beijing’s Capital International Airport, the second-busiest in the world (by passenger traffic) after Atlanta. Many of those take-offs and landings are late. According to FlightStats, a travel industry monitor, China’s big airports have the worst delays in the world, with only 18% of flights from Beijing departing on time in July (arrivals fared better). The strain is showing, especially on the faces of delayed passengers.

Tales of airport rage are frequent media and online fodder; most popular are videos of officials or other bigwigs punctuating their impatience with invective and spittle. Planes pull away from gates on time without clearance to take off and remain on the tarmac for up to 30 minutes, just so the flight can say it is not delayed. Such tricks explain why official figures state that 75% of all arrivals and departures were on time in 2012. Independent estimates put the figure closer to 30%. Airline staff often give no reason for delays.

Bad weather and technical hitches can cause flight delays anywhere, but two man-made conditions are chiefly responsible for China’s problems. Experts agree they must be put right if China’s aviation industry is to continue growing, but they are so deep-rooted, and so political, that they will not be fixed without the intervention of officials at the highest level.

The first and oldest problem is that China’s armed forces control most of the nation’s airspace—perhaps 70-80% of it. This is especially the case above and around cities, leaving very narrow corridors for aeroplanes to take off, land and navigate nasty weather. The second problem, compounded by the first, is that air-traffic controllers have no incentive to move aeroplanes along efficiently—to “push tin” as Americans say—whereas they are punished harshly for any mishaps. The result is that, even in perfect weather, aeroplanes coming in to land are kept much farther apart in China than in America—as much as 6-10 miles (10-16km) instead of about three.

In bad weather, unable to take alternative routes, planes have to stack up more than they would in America, where almost all the airspace is freely available. Pilots complain that they sometimes cannot steer to avoid a storm because of airspace restrictions. Such constraints mean that fewer planes take off when there is bad weather along a route. On July 22nd a report of a meeting held by China’s Air Traffic Management Bureau was posted online. It
stated that planes should be allowed to take off from eight big airports even if it is unclear whether it will be safe to land at their destination, an embrace of risk that shows how desperately officials want to curb delays. (Beijing’s on-time rate for arrivals and departures spiked upwards to 73% in late July, according to one company’s statistics, perhaps as a result of the new policy.)

**Safety, safety and safety**

The good news is that almost all planes take off and land in China safely. That is no small achievement. In the early 1990s the country suffered a series of plane crashes that shocked officials into an obsessive focus on safety. This tough, inflexible approach—“China values safety, safety and safety,” says one American expert—has served the industry well for two decades. According to Boeing, an aircraft-maker, in the decade up to 2008 China’s accident rate was half that of America.

In 20 years the Chinese market has grown almost 20-fold. Total passenger traffic (arrivals and departures, domestic and international) is now the second-highest in the world, after America, having nearly tripled to 319m in the eight years to 2012 (see chart). New airports open every year. Boeing estimates that China’s fleet of 2,000 planes will triple in the next 20 years. For Chinese skies to accommodate all those new planes, experts say, authorities will have to become much more flexible both about airspace and about methods of air-traffic control.

At a recent seminar in Beijing, American experts explained to Chinese officials the Federal Aviation Administration’s approach to air-traffic control, which involves not punishment but “threat-free” reporting of incidents—to encourage the fixing of problems. In addition, American air-traffic controllers are paid more to work at busier airports, and paid still more to do so efficiently, which includes landing more planes. One American expert notes that in China’s risk-averse political system, a leader who proposes such a system risks being fired (or worse) as soon as there is a crash.

The control of airspace by the air force has been a particularly vexing issue for the Civil Aviation Administration of China (CAAC), which oversees commercial flights. In his book “China Airborne”, James Fallows, an American journalist and pilot, describes the amazement of Chinese officials visiting America to discover that planes can fly over the capital, within miles of the White House. This would be unthinkable in Beijing.

In China, any new route must be approved by military officials. The air force has granted some temporary routes for commercial civilian use, but not enough, say experts. This has an environmental cost as well: a lack of flexibility to manoeuvre forces planes to burn much more fuel.

Money plays a role. Industry websites and Chinese newspapers report grumbles that military officials sell access to air space. The structure of government plays a still more decisive role. The armed forces do not answer to the government, of which CAAC is a part, but to the Communist Party and its central military commission. The only person in the system with power over both the army and the government is Xi Jinping, the nation’s
president. If China is to do more to appease its hundreds of millions of airline passengers, the order must come from the top.
Look upwards, and one will see – not aerobatics, but more Chinese flags than ever fluttering gently in the breeze here at AirVenture in Oshkosh, Wisconsin.

Look down, and China has a fast-growing presence in U.S. general aviation, underscored with a national pavilion here and another sponsored by the province of Shandong. Look even more closely and one sees Chinese labeling on an Enstrom 280FX helicopter following the company’s acquisition by China’s Chongqing Helicopter Investment Co., last December.

The drumbeat is relentless. China, in its preparation to meet the pent-up demands of a dammed-up domestic market for general aviation, is buying up general aviation in the West at an ever-increasing rate.

Cirrus. Continental aircraft engines. Epic Aircraft. Superior AirParts. Thielert diesel engines. Brantly, and Enstrom Helicopters. All are now Chinese-owned. Count China as a recently-announced major investor in the ICON light sport aircraft, whose airframes will now be made by Chinese-owned Cirrus, albeit in the U.S. And Chinese money is also bringing the single-engined Cirrus Vision jet to market.

Cirrus CEO Dale Klapmeier notes that owner China Aviation Industry General Aircraft (CAIGA) is committed to supporting the company’s development efforts, and that the Vision is among several products on the drawing table. While he would not specify details, he said yesterday, “We do have plans. We know what . . . we want next; we know what the airframes are. We have a growth path.”

Chinese companies build the Cessna Skycatcher, and will soon be sending Cessna business jets out of their doors. They are already turning out Cessna Caravans.

In Shandong province, Bin Ao Aircraft Industry Co. has built 96 complete Diamond DA40D four-place single-engined diesel-powered light aircraft out of orders for 235, and is now supplying composite airframes to Austria-Diamond as required, and components to the European company’s Canadian operation. All Chinese-built, completed and ordered Diamonds are for Chinese flight schools; all are powered by Centurion diesel engines made by Thielert. That company was acquired last week by Chinese AVIC’s Continental engines subsidiary.
“We have 66% of the Chinese four-seat market between 2008-13 with the Diamond DA-40D aircraft, compared with 34% for Cessna and Cirrus together,” says Li Long, assistant to the general manager and head of sales for Bin Ao, at Oshkosh. Sales campaigns are now underway for the first exports, to Vietnam, Thailand and South Korea, he says.

China’s Yuneec International has taken a step back from aspirations it could flood the world with FAA certified electric-powered aircraft; instead it has gone into partnership with California-based GreenWing International to sell the eSpyder and e430 ultralight kits in the U.S. as experimental light-sport-aircraft kits. In a surprise announcement at AirVenture, GreenWing opened up the order book for the mostly-Chinese-built kits at $39,990. Plans call for the aircraft to be LSA-certified once the FAA grants exemptions to its LSA rules that require a reciprocating engine; an electric engine is currently not allowed under that rule.

GE Aviation will use AirVenture to announce today with its Chinese partners the first, and maybe only service center in China for the new H80 turboprop engine that will power aircraft in that country, including the Thrush 501G crop duster and the single-engined Primus 150 executive aircraft built by AVIC’s CAIGA. GE is well ahead on anticipated demand: the third Thrush 501G out of an initial order of six is currently en-route to China, and the Primus 150 should make its first flight this year.
This report, provided by the U.S. Commercial Service, Department of Commerce, provides an outlook for the annual demand in China for aviation ground support equipment.

Airport Ground Support Equipment Market in South China

SUMMARY

According to the Civil Aviation Administration of China (CAAC), as of 2012, there were 183 civil airports operating in China (excluding Hong Kong and Macao), total airports in China is expected to exceed 200 by 2015 with 63 new airports to be built, 88 to be expanded, and 20 to be re-located.

In 2012, airport passenger turnover volume reached 680 million people/times, up 9.5% over 2011; while cargo turnover volume was 12 million tons, a growth of 4.6%.

Passenger turnover volumes between 2008 – 2012:

Cargo turnover volumes between 2008 – 2012:

Business development among the 183 airports is extremely uneven: 3 airports in Beijing, Shanghai, and Guangzhou take 30.7% of the market share for passenger and 53.5% for cargo transportation.

Airports in China, historically under military or dual military/civil control are transferring management to all civilian control. In March of 2004, CAAC granted authority to local municipal or provincial governments to own and run airports in their
administrative areas, which enables airport projects decision making much faster, which in turn allows financing to be secured more effectively. Airports across China have been and will continue to be built and upgraded to international standards. Foreign companies are major source for highly technical airport ground equipment supply, and U.S. companies have a strong competitive advantage against the mostly European and Japanese manufacturers. Chinese companies are catching up fast to localized lots of the equipment.

MARKET PROFILE IN SOUTH CHINA

A. MARKET HIGHLIGHTS & BEST PROSPECTS

Major airports in South China - 9 civil airports as listed below:

<table>
<thead>
<tr>
<th>Name/ City/Province</th>
<th>2012 passenger volume Growth rate over 2011</th>
<th>2012 cargo volume Growth rate over 2011</th>
<th>Ongoing Projects</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2012 passenger volume Growth rate over 2011</td>
<td>2012 cargo volume Growth rate over 2011</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Unit: people times</td>
<td>Unit: tons</td>
<td></td>
</tr>
<tr>
<td>1 Baiyun Int’l Airport, Guangzhou/GD</td>
<td>48.31million people/times 7.3% over 2011</td>
<td>1.25 million tons 5.8% over 2011</td>
<td>A.3\textsuperscript{rd} underway of Baiyun airport</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>B. 2\textsuperscript{nd} airport in Nansha</td>
</tr>
<tr>
<td>2 Baoan Int’l Airport, Shenzhen/GD</td>
<td>29.57 million 4.7%</td>
<td>854,901 3.2%</td>
<td>Terminal 3 construction</td>
</tr>
<tr>
<td>3 Gaoqi Int’l Airport, Xiamen/Fujian</td>
<td>17.35 million 10.1%</td>
<td>271,465 4.2%</td>
<td>Runway extension &amp; terminal expansion</td>
</tr>
<tr>
<td>4 Huanghua Airport, Changsha/Hunan</td>
<td>14.75 million 7.8%</td>
<td>110,608 -3.7%</td>
<td>Expansion project: taxi way to be extended</td>
</tr>
<tr>
<td></td>
<td>Name/ City/Province</td>
<td>volume Growth rate over 2011</td>
<td>cargo volume Growth rate over 2011</td>
</tr>
<tr>
<td>---</td>
<td>---------------------</td>
<td>-----------------------------</td>
<td>-----------------------------------</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Unit: people times</td>
<td>Unit: tons</td>
</tr>
<tr>
<td>5</td>
<td>Tianhe Airport, Wuhan/Hubei</td>
<td>13.98 million 12.2%</td>
<td>128,196 4.4%</td>
</tr>
<tr>
<td>6</td>
<td>Fenghuang, Sanya/Hainan</td>
<td>11.34 million 9.5%</td>
<td>52,604 8.9%</td>
</tr>
<tr>
<td>7</td>
<td>Meilan Int’l Airport, Haikou/Hainan</td>
<td>10.7 million 5.2%</td>
<td>99,944 2.2%</td>
</tr>
<tr>
<td>8</td>
<td>Changle, Fuzhou/Fujian</td>
<td>7.85 million 9.1%</td>
<td>96,948 10.7%</td>
</tr>
<tr>
<td>9</td>
<td>Wu Xu Airport, Nanning/GX</td>
<td>7.03 million 8.8%</td>
<td>78,134 15.5%</td>
</tr>
<tr>
<td>10</td>
<td>Liangjiang Airport, Guilin/Guangxi</td>
<td>5.69 million 3.6%</td>
<td>33,762 0.4%</td>
</tr>
<tr>
<td>11</td>
<td>Sanzao Airport, Zhuhai/GD</td>
<td>2.1 million 16.3%</td>
<td>16,270 -3%</td>
</tr>
<tr>
<td>12</td>
<td>GZ 2\textsuperscript{nd} Airport</td>
<td>Possible to be located in Nansha, South of Guangzhou, no time frame on when the project to start; in planning stage</td>
<td></td>
</tr>
</tbody>
</table>

B. Best Sales Prospects

According to the China Civil Aviation website, China’s annual demand for ground support equipment is estimated to be $644 million: $242 million for new airports, $161 million for replacing old equipment, $161 million for airport upgrading/expanding projects, and $80 million for military airports.
Best sales prospects for the coming few years are:

- Towing tractors
- Airfield buses
- Food loaders
- Fire fighting vehicles
- Mobile clinics/Ground power units
- Vehicles equipped with Power units
- Waste cleaning vehicles
- Oxygen fueling vehicles
- Air conditioning vehicles/Deicers/ Refuellers
- Runway sweeping vehicles
- Snow sweeping vehicles

C. COMPETITIVE SITUATION

Domestic Production

The quality of most Chinese-produced airport equipment is not up to international standards. With few exceptions, technical airport ground equipment for operations into the next millennium still needs to be imported. At present, there are over 20 Chinese companies in airport ground support equipment production focusing mostly on low-end equipment. In the short term, Chinese companies will not be able to pose any challenge in areas where U.S. firms are the suppliers.

Third Country Competitors

Most of the non-American foreign suppliers are European or Japanese companies including Germany's Siemens, ABB Daimler-Benz, and Daimler-Benz Aerospace; France's Schneider Electric, Aerospatiale and Satair; Japan's Mitsubishi Electric; Italy's Bloss-Fox Manufacturing Company and Intag International; Austria's Rosenbauer and Sweden's FMT.

U.S. Market Position

Although European and Japanese firms take some share of the market, they do not constitute a significant threat to U.S. firms at this time. U.S. firms’ retention of the current market dominance will require continued development and introduction of ever-newer technologies and the means of closer and more cooperation with the U.S. government agencies such as Exim Bank, TDA, and the Commercial Service.

U.S. firms are in a good market position and here are the suppliers and their products:

- S&S aircraft tractors, ground power vehicles, oxygen fueling vehicles, air conditioning vehicles
- LEKTRO aircraft tractors
<table>
<thead>
<tr>
<th>Company</th>
<th>Products</th>
</tr>
</thead>
<tbody>
<tr>
<td>FMC</td>
<td>aircraft tractors</td>
</tr>
<tr>
<td>HOBART</td>
<td>ground power vehicles</td>
</tr>
<tr>
<td>PREMIER</td>
<td>snow sweeping equipment</td>
</tr>
<tr>
<td>JOHN BEAN TECHNOLOGY</td>
<td>aircraft deicers, towbarless tractors, cargo loaders &amp; transporters</td>
</tr>
<tr>
<td>OSHKASH</td>
<td>fire fighting vehicles</td>
</tr>
<tr>
<td>COBUS</td>
<td>airfield buses</td>
</tr>
<tr>
<td>TRILLECTRON</td>
<td>air conditioning vehicles, Oxygen fueling vehicles</td>
</tr>
<tr>
<td>SIMON FIRE EQUIPMENT</td>
<td>fire fighting equipment, Deicer vehicles</td>
</tr>
<tr>
<td>SENSIS</td>
<td>ground monitoring system</td>
</tr>
<tr>
<td>CHOPPER SPORTTER</td>
<td>trailers</td>
</tr>
<tr>
<td>BIRD – X</td>
<td>bird control</td>
</tr>
<tr>
<td>WESTMINSTER INT’L</td>
<td>fire, security &amp; safety consulting services</td>
</tr>
</tbody>
</table>

**MARKET ACCESS**

**A. End users and their projects**

The airport equipment market in China can be politically influenced as the owners of the airport companies are local Chinese governments. Good bilateral government relations surely can facilitate business.

U.S. suppliers will find that they have only 2 major customers for airport ground equipment market in South China: Guangdong Airport Authority and Shenzhen Baoan International Airport Corp. Although there are other airport companies in the region, all of them are state owned enterprises (SOEs). Due to their special position as an arm of the government entity, the airport companies currently act as the end-users, owners, as well as bid evaluators for all the equipment.

**Guangdong province**

Guangdong Airport Authority (GAA)- [http://www.baiyunairport.com/about](http://www.baiyunairport.com/about) manages and operates five airports: Guangzhou Baiyun International Airport; Jieyang Zhaoshan Airport; Zhanjiang Airport; Meixian Airport, and Huizhou Airport.
Although GAA a state owned enterprise, the operation is in full compliance with other international companies. All procurements are conducted through public bidding. Tendering information is available at GAA website: [http://www.baiyunairport.com/about/projectInfo.do](http://www.baiyunairport.com/about/projectInfo.do)

GAA Projects:

Baiyun Airport expansion
--- 3rd runway of 3,800 meters
--- 2nd terminal expansion to add another 595,000 square meters

Guangzhou is planning the 2nd airport, possibly to be located in Nansha, south of Guangzhou. CS Guangzhou is to follow up on the details of the project.

Shenzhen Airport Group Company ([http://www.szairport.com](http://www.szairport.com)) a Shenzhen municipal government invested company sharing the same characteristics of the GAA. In combating the competition from both Guangzhou and Hongkong, Shenzhen airport authority plans to focus on cargo transportation business and considers allotting $2 billion in the next 20 years to build it strong enough to compete with airports in Guangzhou and Hongkong. All projects and procurement information is available at the company’s website. New projects:
--- the 3rd terminal;
--- other auxiliary facilities

Zhuhai Airport Co.([http://www.zhairport.com](http://www.zhairport.com)), from the very beginning, it has been a money-losing program. Still worse, even after the reshuffle with the Hong Kong Airport Company in 2007, there seems to be no way at all to pull the plug on the dark deficit hole and there is no strategy to deal with the super strong competition from the other 4 airports in the Pearl River Delta region – Guangzhou, Shenzhen, Macao and Hongkong. It is still unknown what the Zhuhai Municipal government will do to exit the dilemma.

Fujian Province


Xiamen Gaoqi Airport expansion project:
--- a new terminal of 120,000 square meters
--- runway extension
--- other related facilities expansion

Guangxi Autonomous Region

Guangxi Airport Group Co. Ltd. ([http://www.airport.gx.cn/gsjj.shtml](http://www.airport.gx.cn/gsjj.shtml)) operates six airports in the cities of Nanning, Guilin, Liuzhou, Wuzhou, Baise, and Beihai. Projects to be executed:
Wuzhou Changzhou Island Airport was put into operation in July of 1995. The airport will be relocated and constructed to be Xijiang Airport.
--- new runways
--- new terminal

**Hainan Province**


The projects for Haikou Meilan airport:
--- a new runway of 3,600 meters;
--- a new 290,000 square meter terminal
--- another 45 aprons

Bo’ao Airport:
--- a 2,600 meter runway
--- a 9,000 square meter terminal
--- 26 aprons

**Hunan Province**

There are five airports under the Hunan Airport Group Management Co. Ltd. ([http://csa.hnjcjt.com](http://csa.hnjcjt.com)): Changsha Huanghua Airport, Zhangjiajie Airport, Changde Airport, Yongzhou Airport, and Huaihua Airport.

Huanghua Airport Eastern District Expansion project:
--- a new runway + taxi way of 3,800 meters

Changde Taohuayuan Airport expansion project:
--- a new terminal to be built

Hengyang Nanyue Airport
--- a 2,600 meter runway
--- a 6,000 square meter terminal

**Hubei Province**

Hubei Airport Group Management Co. Ltd. ([http://www.whairport.com](http://www.whairport.com)) owns three airports: Wuhan Tianhe Airport, Enshi Xujiaaping Airport, and Xiangyang Liuji Airport.

Wuhan Tianhe Airport expansion project:
--- 2nd runway of 3,600 meters
--- 3rd terminal of 393,481 square meters

Enshi Airport expansion project:
--- extended the current 250 meter runway to 2,600 meter
B. Agent/Distribution

Most of the airport ground equipment has both a high price tag and comes with service warranties; a direct channel from the manufacturer to the airport authority is the preferred method of sale. In addition, these types of agents/distributors are limited; usually, the best candidate agents or distributors in the aviation Chinese market are subsidiaries of the local big players.

C. Trade Shows

1. 2013 China International Airport Technology, Equipment, and Service Expo
   September 2 – 4, 2013
   Venue: China International Exhibition Center, Beijing
   Point of contact: Mr. Li Jun
   Tel: 86 136 9324 6851, 86 10 8958 7836    Fax: 86 10 8958 7763
   Email: lijunjifa@163.com

2. U.S. – China Aviation Symposium
   September 9 – 11, 2013
   Venue: Renaissance Beijing Capital Hotel
   Point of contact: Lena Yang, Commercial Service Guangzhou
   Tel: 86 20 8667 4011    Fax: 86 20 8666 6409
   Email: lena.yang@trade.gov

3. The 10th China Aviation and Aerospace Exhibition
   November 11 – 14, 2014, Zhuhai, Guangdong
   Point of contact: Lena Yang, Commercial Service Guangzhou
   Tel: 86 20 8667 4011    Fax: 86 20 8666 6409
   Email: lena.yang@trade.gov
Note: This document represents CAAC’s strategic Energy Conservation & Emission Reduction project focus for 2013. CAAC provided a special fund to subsidize Chinese aviation organizations ECER initiatives.

1. **2012-2013 Civil Aviation Energy Conservation & Emission Reduction (ECER) Project Catalogue**

1. **Civil aviation ECER technologies**
   1) Installation of winglets projects
   2) Aircraft weight loss project (Electronic Flight Bag, Selection of lightweight materials food carts, Seats and ULD, replace lightweight material for oxygen bottles and safety equipment)
   3) Aircraft engine modification project
   4) Aircraft engine washing project
   5) Aircraft engine monitoring project
   6) Aircraft RNP, PBN, ADS-B installation
   7) The surface of the aircraft fuselage drag reduction project
   8) The bridge onboard power/air conditioning alternative APU project
   9) The distant parking ground power and aircraft dedicated air conditioning renovation projects
   10) Airfield lighting system renovation project
   11) New materials and new technology building energy-saving application project

2. **Civil Aviation Management Energy Saving**
   1) Flight operations system optimizing project
   2) Flight data/energy consumption data monitoring system
   3) Terminal building energy management system (Heating, refrigeration, lighting, elevator etc)
   4) Building energy management system
   5) To short aircraft ground waiting taxiing time system

3. **Energy-saving products and new energy applications**
   1) Solar energy application projects
   2) New energy-saving lamps/Lighting control system
   3) Efficient boiler project
   4) New heating and cooling technology and pipeline laying reconstruction project

4. **New energy and energy-saving ground support vehicle purchase and replacement**
   1) New energy and energy-saving ground support equipment for flight operation support. (Power supply vehicles, Aircraft ground air conditioning equipment vehicle, Aviation static variable power supply, Aircraft Tractor, Ground guided vehicles, passenger elevator car, Self-propelled aerial assembled unit loader, Mobile bulk Luggage, Cargo loaders, Aircraft sewage trucks, Aviation refuse trucks, Airport dedicated sweeper vehicle)
   2) New energy ground support vehicles (battery or electric drive) equipment construction and renovation (including charging stations, pile construction)
5. **Route optimization**
   1) The Civil Aviation temporary route management system

6. **Airport waste, sewage treatment and water reuse facility improvement**
   1) New technology on waste classification and recycling
   2) New technology on Sewage treatment
   3) Water reuse facility improvement project
   4) Environmentally friendly deicing fluid and recycling project

7. **Civil aviation energy saving and emission reduction standards, statistical, monitoring and evaluation system**
   1) Civil Aviation energy-saving equipment/construction standards
   2) Energy-saving design standards research for Airport construction/renovation
   3) Civil Aviation energy saving operation standards research
   4) Bio fuel/Alternative fuel technology standards research & study
   5) Aircraft engine emissions validation standards
   6) Civil Aviation saving data acquisition system
   7) Civil Aviation ECER Inspection center set up
   8) Airport aircraft noise monitoring project

8. **Basic and Strategic study on Aviation ECER**
   1) Civil Aviation ECER policy/theory/technology track research and study
   2) ECER and aviation development strategic research project (carbon transactions studies, bio fuel/alternative fuel's impact etc.)
   3) China's aviation and environmental management, energy saving evaluation system implementation methods study
   4) Air traffic management technology application research projects (fuel saving PBN, approach, Aircraft ground taxiing and gate allocation optimization, complex weather forecasting technology etc.)
To: all provinces, autonomous regions, municipal governments, ministries and institutions directly under State Council:

Civil Aviation is a key sector for our economic and social development. As a result of increased reforms and liberalization, our civil aviation sector has developed rapidly and continues to grow. Reforms leading to enhanced service capabilities and improved safety standards have contributed the most to our liberalization and the creation of socialist modernization. However, a lack of coordination and balanced management of air space still present challenges to the development of the civil aviation sector. The uneven distribution of air space resources, slow development of infrastructure, lack of skilled labor, low business competitiveness, and poor administrative system contribute greatly to the remaining challenges. The following recommendations provide steps to ensure the development of the civil aviation sector:

I. General Requirements

1. Guiding thoughts: The Opinion is guided by Deng Xiaoping’s theory and the “3 representatives” ideology to implement scientific development concepts, change methods used to achieve growth, encourage a mindset guided by a desire to achieve change and innovation, emphasize advanced, safe and sustainable development, improve the quality of products to ensure international competitiveness in order to meet economic and social development goals and to serve the needs of the general public.

2. Basic principles:

--Prioritize people and their safety first;

--Harmonize planning and coordinate development regionally as well as across sectors; coordinate the civil aviation sector with military aviation and relevant sectors in other modes of transportation.--Have a proactive attitude that is relevant and forward-thinking: strengthen infrastructure development, upgrade the quality level of equipment and guarantee service capability;

-- Use free-market ideology in reforms and innovation: eliminate systematic barriers, open up markets and maximize productivity;

--Make structural adjustments to expand capacity and increase efficiency: make efficient use of air space to increase flying capacity, promote technological progress and energy conservation, and reduce carbon emissions.

3. Development targets:
-- Increase air transport capacity to 170bil ton/km; increase the annual growth rate to 12.2% and annual average flight frequency to 0.5 flights per person per year;

-- Increase the safety rate controlled to 0.15 accidents per million hours and ensures that at least 80% of flights are punctual;

-- Increase the total flying hours for general aviation to 2 million hours with an annual growth rate of 19%;

-- Increase economic and social benefits by making air services available to 89% of the nation’s population.

II. Major tasks

4. Strengthen airport planning and construction: In order to meet the targets identified in the nation’s strategy for overall economic and social development, the construction of crucial infrastructure such as airports requires improved planning and accelerated construction within our capacity. Airport planning should allow space for further development while simultaneously ensuring safety, remaining economically viable and conserving energy in a way that is environmentally friendly. In order to develop a comprehensive transportation system, airports should be able to connect with other modes of transportation more efficiently. Efforts should be made to build Beijing, Shanghai and Guangzhou airports into international hubs with improved facilities and global radiative functions. Kunming and Urumqi airports should serve as gateway airports while Shenyang, Hangzhou, Zhengzhou, Wuhan, Changsha, Chengdu, Chongqing and Xi’an airports should serve as regional hubs. Furthermore, large airports should serve as integrated transportation hubs. Newly-built airports should incorporate mechanisms for defense and general aviation development while also increasing the capacity of existing airports pragmatically. Airport resources must be integrated complementarily among dense airports in the Pearl River delta, Yangtze River delta and Beijing-Tianjin-Hebei regions. More attention should also be focused on the planning and construction of airport auxiliary facilities including passenger services, air cargo collection and distribution, and fuel supplies.

5. Scientifically plan and arrange domestic flight route network: The establishment of domestic air transport networks that utilize international hub airports and domestic trunk lines as the pillar and regional and general aviation airports as supplements is imperative. Top priority should be given to building express airway networks among airports that handle over 10 million passengers. The connection between trunk lines and regional routes as well as between regional routes should be improved. The accessibility and utility of small and medium-sized airports should also be improved. The “basic air service scheme” should be implemented by using inexpensive aircrafts to meet the needs of inland areas including poor and underdeveloped regions as well as areas where minority people live. Route networks between China mainland and Hong Kong and Macao should be optimized while points and
flights between the two sides of the Taiwan Strait should be increased. Cargo flights route networks and multimodal transportation need to be developed proactively and the use of internet technology should also be maximized.

6. Make great efforts to develop general aviation: traditional general aviation business in agriculture and forestry should be consolidated. General aviation should serve as the vehicle for achieving economic growth by proactively developing general aviation services in areas of emergency assistance and medical emergency, maritime sovereignty safeguarding, and private and business corporate jets. The establishment and development of general aviation enterprises via probe business model demonstrations and innovative operation mechanisms to improve the level of management should be promoted. In order to create better environment for the development of general aviation developing comprehensive general aviation reform will require improved infrastructure construction, developing pertinent legislation regarding general aviation and standardizing systems, and improved air traffic control.

7. Strive to increase international competitiveness: in order to adapt to the new trend of China’s opening-up and international air transport development, comprehensive research should be conducted on open policies for international air transport while fostering mutual cooperation to achieve a win-win result. More support should be provided to develop domestic passenger and cargo airlines, improve management levels, tap into the international market, and increase competitive advantage in order to create international airlines that have the capacity to provide globalized services. The structure of international routes should be improved, especially medium and long distance routes. The density of flights to Europe and American regions should be increased and more routes to South America and Africa should be added. The air transport relationships with neighboring countries should be consolidated by promoting aviation integration with ASEAN countries. International aviation cooperation should be improved and participation in ICAO’s standard-setting.

8. Continuously improve the quality of air transport services: Flight punctuality should be increased according to the requirements of scientific dispatching and forcible guarantee. Delay warning and notification systems should be established for the general public and emergency mechanisms and standard services for large scale flight delays should be improved. Information technology should be disseminated, operational procedures should be optimized, equipment capabilities should be improved, and luggage transport quality should be ensured. The service quality standard system should be enhanced and implemented, boarding procedures should be simplified, differentiated service products and brands should be created to increase consumers’ satisfaction.

9. Increase air transport safety levels: Stick to the principle of “safety first, prevention as key comprehensive measure”. Maintaining safety should be a continuous priority which should be accomplished by improving standard safety rules and establishing long-term,
efficient, and safe production mechanisms. The safety standards for productive operational entities and safety enforcement systems should be improved to increase accountability for meeting safety standards. Tracking systems for safety warnings and strict safety evaluations should be conducted to enforce accountability. The air marshal system should be improved as well as the communications and coordination between relevant administrative departments and local governments to ensure the safety of air space. Qualification levels for professional technicians including pilots, traffic controllers, repair people, dispatch signees, safety checkers, etc should be improved. The development of information technology should be improved, proactively disseminate safety production information. New equipment for safer operational management should be developed and the emergency assistance system and rescue plan for emergencies should be improved.

10. Accelerate the construction of modern air traffic control systems: Route network structures should be improved and large capacity air expressways and parallel lines for busiest routes should be built. Route structures and air space at airport terminals for the busiest regions should be optimized. The quantity of entry and exit routes in the busiest airports should be increased and international routes flying over ocean areas should be opened. Air traffic control districts should be optimized and integrated and practical plans for higher-altitude air traffic control areas should be developed. Next generation air traffic control systems should be created and capacity-building for air traffic control communications, navigation, monitoring capacity as well as weather information services should be improved. The management of operational equipment should be improved as well as air traffic control systems and operational mechanisms for civil aviation.

11. Take measures to make aviation a green and low-carbon emission sector: Zigzag routes should be changed into straight line routes in order to make efficient use of the temporary routes. Ground operation and organization should be maximized to reduce unnecessary flying and waiting time. Airlines should be encouraged to import aircrafts of low emission and to dispose of the high pollution causing aircrafts. Fuel-saving renovations for aircrafts should be promoted as well as research and use of bio-fuel. Counter-measures should be established to deal with global climate changes that affect the aviation sector. Standards for green airport construction and new, environmentally-friendly materials should be created. An energy contract administration should be created. A monitoring system for large airports and safe treatment facilities for air pollution and waste should be created.

12. Proactively support domestic civil aircraft manufacturing: Cooperation and synergies between the civil aviation sector and aviation industry should be promoted. Capacity-building in airworthiness evaluation and aircraft operational review should be improved to advance the organizational system for airworthiness evaluation. Jumbo-aircraft strategies should be utilized and domestic regional aircrafts and general aviation jets should be researched and utilized. Guidance should be provided on the distribution of aircrafts, engines and airborne equipment so as to foster a China-made airborne products
manufacturing system conducive to China’s civil aviation development. After-sale service systems and operational technical support systems should also be improved. Bilateral airworthiness scales and international cooperation with the United States and Europe should be improved.

13. **Proactively promote the economic development of aviation:** Improvements in industrial restructuring and regional economic development through the scientific development of the civil aviation sector should be promoted. Local governments should be encouraged to research and develop air passenger and cargo transport, general aviation, airborne product manufacturing, aviation financing, aviation tourism, aviation logistics and high value-added product manufacturing with modifications incorporating local characteristics to create an improved industrial aviation chain. Pilot programs should be implemented to demonstrate the state of the aviation economy and form an agglomeration area for the air industry in the Pearl River Delta, Yangtze River Delta and Beijing/Tianjin/Hebei regions.

### III. Policy measures

14. **Improve legislation and planning:** Air space-related legislation should be improved and the PRC Civil Aviation Law should be revised. Legislation regarding aviation safety, air transport, airworthiness evaluation, general aviation etc. should be improved to create comprehensive civil aviation laws and a standardized system. A national air space plan should be created for the general aviation industry. The “national civil airport location plan” should also be improved. All local governments should have their own plan for civil aviation development in concert with their plans for local economic and social development, land use management and urban/rural construction.

15. **Make greater efforts in reforming air space management:** Air space resources should be efficiently used. Unified planning of military and civil air space is necessary to create an air space management environment that serves the harmonious development of air transport, general aviation and military aviation. The coordination between civil and military aviation should be improved and should incorporate a mechanism for the flexible use of air space. Air space should be scientifically categorized and a classification management system should be implemented. Supplementary work that promotes low-altitude air space administration reform should be improved. Basic theories, rules and regulations, and operational management and service provision systems for low-altitude air space administration should be created and should incorporate Chinese attributes. The organizational structure and operational methods should be in alignment with the low-altitude administrative reforms.

16. **Improve administrative systems and mechanisms:** Civil aviation administrative mechanisms that facilitate the achievement of civil aviation development and improve construction of various regional administrative institutions at all levels should be created.
The professional administration of civil aviation departments over airlines should be approved along with the evaluation systems for large airlines and air transport enterprises. Guidance should be provided for the administration of civil aviation departments to pay more attention to the social benefits of air transport. The “Regulations on the Administration of Civil Airports” should be implemented and the roles of local government and its relevant functions in developing airports should be clarified. Air transport pricing reform using market-oriented resource distribution should be gradually implemented and price creation mechanisms should be modified accordingly. The fee policy regarding civil airports and air traffic control should be improved. The opening up of markets of jet fuel, airborne materials, air traffic information and other air services should be accelerated. Guidance for foreign and private capital to invest in the civil aviation sector should be provided and investments should be encouraged.

17. Support scientific research and increase skilled labor: Innovations in civil aviation should be incorporated in the nation’s science and technology plan and research labs should be established at the national level. Researching and disseminating core air traffic control technology, airworthiness evaluations and new flying techniques etc. should be increased. The use of the Beidou Satellite system in the civil aviation sector should be promoted. The development of the core information platform for the air transport system should be accelerated. The testing capability for civil aviation equipment should be improved to ensure the equipment meets safety requirements. Key skilled professionals should receive increased training including pilots, MRO, traffic controller etc. Non-aviation colleges and universities should be encouraged to train professional personnel for the civil aviation sector. Preferential welfare treatment should be implemented and adequate salary policies for civil aviation professional technicians should be used to support professionals in the civil aviation sector.

18. Improve financial and tax support policies: increase Capital investments in the construction and development of the civil aviation sector should be increased. The central budget will continue to support the construction and operations of airports in the middle and western regions. The management and use of civil aviation development funds should be maximized and the expense structure should be improved. The administrative requisition system for emergency assistance and special key projects should also be improved. Additional jet fuel taxes should take into consideration fuel prices. Land used in airport and comprehensive hubs construction should receive tax exemptions according to the relevant policy measures. Qualified airport zones should be encouraged to apply the establishment of bonded areas according to standard procedures and relevant tax policies. Preferential import tax policies for certain types of aircraft, engines and airborne equipment should still continue.

19. Improve financial services: Possible measures to establish civil aviation equity investment enterprises with diversified stakeholders should be identified. Policy measures
promoting the development of the domestic air leasing sector should be drafted. Financial institutions should be encouraged to provide preferential credit support regarding aircraft leasing, airports and auxiliary facilities construction. Financial institutions should also be encouraged to support IPOs, as bonds and mid-term bill issuances for aviation enterprises. Various financing institutions should be encouraged to provide insurance for civil aviation infrastructure facility construction projects. The commercialization of third party war liability insurance for aircrafts of domestic airlines should also be consistently promoted.

All local governments and departments should be fully informed of the significance of promoting civil aviation development. They should change their thought processes and mindset in alignment with these objectives. They should work hard on identifying practical measures to implement all tasks in the Opinion. They should actively coordinate amongst one another to resolve key issues in the development of the civil aviation sector and also foster an environment conducive to the scientific development of the civil aviation sector.

State Council

July 8, 2012
On January 14th, the General Office of the State Council issued *Work Division Scheme of Priority Tasks to Promote the Development of Civil Aviation*, (hereinafter known as *Work Division Scheme*), which spells out and details the objectives and tasks provided in *Several Opinions of the State Council to Promote the Development of Civil Aviation*, (hereinafter known as *Several Opinions*), further specifying the duties and responsibilities that provincial (autonomous region, municipal) governments and related agencies of state council should take in implementing *Several Opinions*, containing 56 aspects classified into 16 categories.

*Work Division Scheme* requires related departments and agencies to genuinely embody the spirit of *Several Opinions*, further dissecting and detailing the tasks involving them, sparing no time in working out specific measures. For tasks involving two or more departments, the heading department should strengthen coordination, while supporting departments should actively and closely cooperate. NDRC and CAAC should carefully perform the planning, supervision and
Work Division Scheme requires governments of all provinces, autonomous regions, and municipalities to play the primary role in strengthening communications and connections among related departments, speeding up the push for all tasks to be done.

Work Division Scheme has further divided the ten main tasks provided in Several Opinions. In terms of improving airport planning and construction, related departments are required to spare no time in finishing framework building, and to be more vigorous in doing so; they are also required to ensure the effective transition between airports and other means of transportation; they are also required to expend efforts in a) building airports in Beijing, Shanghai, Guangzhou into major international air hubs that are all-round functioning and globally connecting, b) fostering gateway airports in Kunming and Urumuqi, and c) improving the regional pivoting function of airports in Shenyang and other places. In terms of scientifically planning domestic routes network, priority should be given to a building a domestic routes network characterized by international hubs and domestic bulk airports constituting the main frame that is complemented by regional and commuting airports; in backwards, underdeveloped and bordering areas and areas where surface transport is examination.
inconvenient, the “basic air service plan” should be implemented; routes connecting the mainland and Hong Kong and Macau should be optimized, and cross Taiwan-straits routes, flights and city-pairs should be increased. Cargo routes networks should be improved by promoting and adopting the technology of Internet of Things and by actively conducting multimodal transport. In terms of being active in developing general aviation, traditional general aviation in agriculture and forestry should be consolidated; emerging general aviation in emergency relief, medical aid, maritime rights protection, private air travel, and business air travel should be actively developed; the growth of general aviation businesses should be promoted; pilot programs in comprehensively reforming general aviation should be unswervingly carried out, construction of general aviation infrastructure should be strengthened, and standards system of general aviation should be perfected to foster a favorable environment for development of general aviation. In terms of enhancing the competitiveness in international aviation, concerted efforts should be made in studying open policies of international aviation transport; competent domestic cargo and passenger to operators should be encouraged to improve international competiveness; improve international routes configuration and actively take part in establishing international aviation standards. In terms of constantly improving air travel service quality, rate of flight regularity should be vigorously increased, improve emergency response system to large-scale flights delays, post-flight-delay
services should be regulated; information technology should be promoted; boarding procedure should be simplified to increase customer satisfaction.

In terms of promoting the safety level of aviation, we should strengthen the concept of sustainable safety, establish and perfect the long-term mechanism of safe operations, strictly implement unit safety main responsibility area during operations, promote supervision and handling mechanism for safety risks and responsibility taking mechanism for safety issues. Furthermore, we should strengthen management of qualifications of professional technical staff, increase our investment in safety as well as strengthen the building of emergency rescue system. With regard to expediting the establishment of modern ATM system, our focus should be on adjustment and perfection of route network layout, optimization and integration of ATC sector setting, perfection of ATM mechanism and operations mechanism as well as promoting vigorously next-generation ATM syste. With regard to effectively establishing green low-carbon aviation industry, our focus should be on implementation of direct-route selection and detour elimination, enhancing temporary route efficiency, encouraging airlines to introduce energy-conserving and environmentally friendly aircraft model, promoting fuel-saving modifications of aircraft, promoting research and application of biofuel, taking measures to address the impact of global climate change to aviation industry, establishing and implementing construction criteria
for green airports, establishing large-scale airport noise monitoring system. With regard to **actively support Chinese-made commercial aircraft**, we should encourage airline industry and aviation industry to form a cooperation mechanism on scientific research with our focus on capability development of airworthiness certification and aircraft operations evaluation & review capability, encourage R&D and application of regional aircrafts and general aircrafts domestically and guide indigenization of aircraft, engine and airborne equipment. With regard to **striving for development of aviation economy**, we should promote adjustment and upgrading of industrial structure and driving for growth in area economy through scientific development of airline industry, select some regions for pilot projects of aviation economy demonstration district, expedite formation of aviation industry congregation area in Pearl River Delta Region, Yangtze River Delta Region, Beijing, Tianjin as well as Hebei Province.

Work Division Scheme also explains the six policies of **Several Opinions** in details. With regard to **reinforcing legislation and planning**, we should perfect laws and regulations associated with airspace management, promote revision of *Civil Aviation Law of the People’s Republic of China*, compilation of nation-wide airspace planning and general aviation industrial planning and perfect *Layout Planning of China’s Civil Airport*. Every region shall compile the local aviation development plans and at the same time pay attention to linking up with local
plans for economic development, land utilization and urban-rural development.

With regard to **building momentum in airspace management reformation**, we should expedite transformation in terms of airspace management approach and assist with the reformation of low airspace management. With regard to **perfection of management mechanism**, we should strengthen management organization development of all areas within civil aviation system, reinforcing management authority of civil aviation governing authorities to civil aviation enterprise, perfect aviation safety and security guarantee mechanism, implement in a full scale *the management regulations of civil airports*, deepen reformation of airport management mechanism, help market play its basic role in resource allocation, expedite market opening for service guarantee aspects including jet fuel, aviation materials, aviation communication, etc. With regard to **reinforcing science and education and talent support**, we shall incorporate aviation science & technology innovation into science & technology planning system of our nation, establish corresponding national level key lab of aviation industry, enhance the application of new technology in civil aviation sector, expedite upgrading and transformation of the core information platform of air transportation system, implement key talent projects and stabilize professional talents of aviation industry. With regard to **perfecting fiscal support policies**, we should increase investment on the building and development of aviation industry with the focus of central fiscal policy on supporting construction and
operations of middle and western regional airports. Moreover, we should attach more importance on collection and usage of aviation development funds, optimize the structure of fund expenses, perfect admin requisition policy for emergency rescue and major projects, implement the linkage mechanism of fuel surcharges and fuel price, guarantee land availability for construction and development of airports and integrative hubs and implement corresponding tax deduction policy per rules and regulations. With regard to improving financing services, we shall do researches and establish investment (funding) companies owned by our aviation industry with diversified sources of investment and also perfect the credit enhancement system including financing and guarantee of aviation enterprises.

On July 8, 2012, Several Opinions was officially published. It clearly defines overall requirements, main tasks, policies and measures, and lays down direction for current and future development of aviation industry. This is the first key document since foundation of People’s Republic of China which is issued by State Council and which provides comprehensive guidance for development of aviation industry. This is an important milestone in the development history of civil aviation industry.

Note: This document lists CAAC’s 2013 focus

National Civil Aviation: 2013 China’s civil aviation
six key work tasks

2012 results belong to the past, the upcoming 2013 "Twelve Five" a crucial year for the past and the General Administration of Civil Aviation of China under the guidance of the 48 spirit of the party, deepening implement “a number of opinions” for the new year. The development of a new plan. Deputy Secretary for the Civil Aviation Authority, Li Jun, the work report made clear the focus of the six areas of the civil aviation next year.

**Priority 1: effort to ensure continued safety**

Firmly establish the continuing safety concept. Further deepen the understanding of the continuing safety concept, to firmly establish and always adhere to the practice. Effectively change the ways and means of grasping security, putting prevention, systems management, set up to improve the security management mechanism, so that the combination of resolve key and difficult problems and to do the day-to-day security, special treatment and ongoing monitoring of combination to achieve security management standardization, normalization and long effect. Give full play to the role of the Safety Management System (SMS), continue to perform the audit of airlines, airports, air traffic control and other units to expand the building range, security risk management, security, performance management into production running. Increased investment in security infrastructure, and continuously improve the safety level of protection.

Adhere to grasp the key link of the security is guaranteed. Consolidate and expand key professionals qualified construction achievements, new each year, the transformation and upgrading of professional and technical personnel, especially pilots, and to strengthen the qualification management. Included in the scope of management of general aviation enterprise key professional and technical personnel, training institutions and enterprises security management. Qualification building extends to the use of links from the staff recruited to develop links. Further strengthen safety responsibility system, in particular the main responsibility for the implementation of good safety production run units.

An effective solution to the outstanding problems affecting safety. Resolutely reverse ground vehicle collided with the aircraft, runway foreign object intrusion, multiple the tire rolling injuries and bird strikes trend. Renovation and expansion of the airport, and must take the non-stop flight construction safety management in a prominent position. Tendency to change the security cabin light work of heavy service, cabin safety standards are implemented. Enhance cabin safety publicity to raise awareness of passenger safety. China Airlines co-management efforts to increase the sales agent, resolutely ban undocumented agent, against a false name, the entrainment of dangerous goods violations.

Continuing to strengthen the air defense security. To maintain a high degree of vigilance of the air defense security, efforts to study and solve the basic problem. Institutional mechanisms to continue to improve air safety, prominent enhance the prevention and control and disposal
Particular, to strengthen the security business systematic construction, to standardize security posts and employment, and to optimize the security screening process, strict inspection standards, promote the security of new technologies and the application of new equipment to improve the safety check control performance. Actively explore effective way to deal with intimidation information, coordination of law enforcement agencies in the while strengthening emergency disposal, to increase the punishment.

Focus 2: multi promote healthy growth

Expand the domestic airline transport. In the tense moments of the flight of large hub airports, take the way of the use of wide-body aircraft, and improve transport capacity. Intensify research to meet the demand for passenger and cargo growth transition program before the completion of the new airport in Beijing. Increase in more than ten million airport between the Air Express. Improve regional feeder network, and continue to take the Regional Express the ring string flight "rich feeder products in Xinjiang, Yunnan, Inner Mongolia, Heilongjiang and other provinces. Encourage airlines to open or encrypted "Laoshaobianqiong" regional flight routes. Promote the popularization of the implementation of the strategy, and to carry out basic aviation services pilot.

Enhance the international airline transport. Adhere to the "expansion of China and the United States to consolidate China-EU, to open up South America, Africa, encryption surrounding the principle and the development of international air transport. The hub construction as the starting point, and to promote the transformation of international air transport growth mode. The airline passengers product and service system, to build the whole process and make good use of international airline alliance platform, expand win-win cooperation. Beijing, Shanghai transit visa policy, attract international transit passengers. Improve the subsidy policy to encourage open up remote routes. Focus on building large and complex international hub, and reasonable build regional international hub.

Transformation of cargo development. Air cargo by a single freight transportation, warehousing, distribution and other logistics service providers in transition, to break ground and air transport links. To actively explore the transportation business of high value-added products, improve the income level. Accelerate the improvement of freight information system, to enhance the goods fast processing power, to improve cargo flights, especially night flight support capabilities. Encourage cargo airline, logistics enterprises to carry out the depth of cooperation or mergers and reorganizations, improve market competitiveness. Cargo airlines are encouraged to join the airline alliance, for a variety of business cooperation.

Encourage and support general aviation. Improved general aviation business license, and reduce the cost of enterprise build. Implementation of record management by the Regional Authority of the introduction of the general aircraft. Implement the subsidy policy, focusing on the training of flight personnel to support the the agroforestry welfare general aviation operations. Improve the business aviation ground service processes, and give full play to the advantages of convenience. Promote general aviation airport building and developing good Alxa commuter airline pilot, allowing companies to take advantage of the Universal airport and aircraft to carry out short-distance passenger and freight transport services.

Key 3: effectively improve the running quality

Do everything possible expansion efficiency. Coordination of further optimization of Beijing, Shanghai and three airspace, fight shed more fixed, temporary routes, increased of articulation routes and airspace import and export, optimizing the wait for the program. Implementation approach and departure separation of the 30 airports in Urumqi, Shenyang, Harbin and Taiyuan. Good operating
conditions to improve the assessment of the expansion of the airport, and strive to release more flight time. Revise and improve the ATM operational standards, to carry out the Beijing-Shanghai, Beijing-Guangzhou route control to adjust. Accelerate the establishment of a unified national traffic management systems.

Firm and effective governance flight delays. Seriously implement a number of measures to regulate the running order, do a good job of flight normal "and" measures to reduce ground the aircraft shut door after long waits, and effectively improve the flight normal rate. Reduce delays caused by subjective reasons, in particular to reduce the long delays. Airport passenger throughput of more than 10 million people to establish a the flights run collaborative decision-making system. Snow, thunderstorms capacity to respond, and proper disposal the large area of flight delays, to do service work. Implement the the flight diversions responsibility to provide good protection. Strengthen legal advocacy and on-site management and control, to guide travelers legitimate rights, maintenance of the running order.

Focus on improving the convenience of air transport. Through the simplification of procedures, optimize processes, improve operational efficiency, as much as possible to save travelers time. Airlines to strengthen cooperation with other modes of transportation, empty Railcom "to actively promote" open space intermodal services in areas where conditions permit, and also the construction of the city’s Terminal for check. Airport in support of the Joint Inspection Unit to facilitate the entry of visitors, optimize and coordinate local ground transportation.

**Priority 4: actively deepen reform and opening**

Collaboration to promote the reform of the airspace ATC. Provide recommendations based on in-depth research and feasibility studies for the establishment of the airspace management system to adapt to the development of civil aviation and military aviation. Taken from the infrastructure, personnel training measures and carry out related work. Achieved national ATC Board to support and promote the implementation of the national backbone route network planning scheme. Conditions in the region, will adjust airspace structure first. Reforming institutions of science to determine the institutional positioning of the Air Traffic Management System. Deepen the internal reform of air traffic control systems, the focus on conversion mechanism to mobilize the positive factors to improve the performance of control services.

Focus on strengthening the market mechanism. Adhere to the "administration according to law, relying on the market, decentralization, to promote the development of the principles of a molecular Company newly established airlines and airlines, new routes, increasing flights administrative licensing matters, under the premise that adhere to safety regulations, standards, more play to the basic role of the market in resource allocation. Revised business license requirements for public air transport enterprise, to adjust enterprise access policies. Conscientiously implement the introduction of the revised transport aircraft management approach to strengthen macro-management, focused on security control, simplify specific audit projects.Classification and grading of perfect freedom rights management approach. According to airport capacity and unit hour peak takeoff and landing capability, fair and reasonable configuration of flight time. Deepen the price reform, the release of some routes fares. Unified domestic and overseas airlines international flight charges, the same field with the price.

Improve the quality of opening up to the outside world. Powers and neighboring key civil aviation relations with the United States, Russia, the European Union, as well as Japan and South Korea, ASEAN and other major markets; focused on developing and emerging markets, further development in Central
and Eastern Europe, Central Asia, South Asia, Africa and Latin America countries the bilateral civil aviation relations, promoting the formation of structural optimization, multivariate balance, hub-oriented pattern of opening of the air traffic rights. Adapted to local needs, opening up its regional hub for passenger and cargo air traffic rights. To strengthen the Convention on International Civil Aviation and its related standards and recommended practices, and actively participate in the work of the new set and modify. To play its due role in strengthening the multilateral communication and co-operation in the establishment of an international aviation emissions reduction mechanisms. Continue to strongly support the work of setting up with the ICAO Asia Pacific sub-offices. Take effective way to enhance the safety and economic regulation of the foreign flight.

Priority 5: focus on enhancing the protection capacity

Accelerate the construction progress of the implementation. Hefei, the new airport should be completed as soon as possible navigable years into about 10 regional airports. Pay close attention to Shenzhen Baoan, Xining Caojiapu, Longdongbao airport expansion. Do a good job of Pudong, Shanghai, Guangzhou Baiyun, Nanning, Shenyang Taoxian, Nanjing Lukou, Tianjin Binhai, Wuhan Tianhe Airport expansion project, started in Zhengzhou, Harbin, Yinchuan Hedong Airport Expansion. Strive to Xi’an and Chengdu Regional Control Centre project is completed and put into operation, to speed up the regional control center in Urumqi and Shenyang, Shanghai Terminal Control Center and other air traffic control project construction, promote the the ATM “three centers” such as the construction of major projects. Implementation of the ATC works with the centralized management of the airport project, the formation of a new air traffic control engineering advisory bodies, support to speed up the construction of the air traffic control system. Continue to expand aviation fuel supply channels, to promote the construction of storage and transportation system, to ensure that the jet fuel supply. Give full play to the role of the Air Materiel shared platform protection. Vigorously promote the use of new technology. Accelerate the implementation of performance-based navigation (PBN), to improve Airport PBN flight procedure execution rate. Promote the construction of the ADS-B system, to determine the ground station building program and airborne equipment retrofit program to accelerate the construction and operation of the key areas in the South China Sea and the western. Expand the head-up display (HUD) and enhanced the visual system (EFVS) the scope of the pilot. Promote the airport runway arresting system construction. Passenger throughput of 10 million passengers the airport as soon as possible to achieve the Class II blind drop run airport conditional strive construction the class III blind drop system. Promotion the alternative aircraft APU bridge onboard equipment to accelerate the national airport. Speed up the the Travelsky new generation passenger service system construction, and comprehensively improve the level of information of the whole industry.

Preparation Work. Implementation of infrastructure investment project management approach of the previous work fee. Speeding up the preliminary work of the new airport in Beijing, and strive to start as soon as possible. Moderate advance planning and medium-sized airport expansion and new small airports, increase project reserves. Preliminary work of scientific organizations, coordination of efforts to increase the land-use planning, environmental assessment, to shorten early work cycle.

Priority 6: Continue to strengthen science and education Societe Generale

Strengthen institution building. Pay close attention to the implementation of the third phase of the expansion project of the Civil Aviation University: accelerate Flying School, Suining airport relocation project, Langzhong branch of engineering, the implementation of the flight personnel
training expansion goals. Pay full attention to vocational and technical education, the implementation of Guangzhou, Shanghai Vocational Technical College new campus project, the direction and scale of demonstration to establish Management Institute to carry out vocational and technical education. Teachers, teaching materials and laboratory building to further strengthen and improve civil aviation unique professional educational standards, vigorously improve the teaching level. Encourage qualified educational institutions directly under the culture of non-civil aviation civil aviation professionals, expanding the joint construction Liaison.

Strengthening of qualified personnel. Make full use of internal and external resources of the industry, intensify personnel training. Should be highly skilled personnel training in an important position, and there are plans to address gaps. Implementation of key regional talent support programs, the expansion of the central and western regions and small and medium-sized airports Civil Aviation professional personnel training. Types of training, do a good job under the system of the overall planning of brand training programs to ensure that the quality of training. Establishing a pay system that is conducive to the growth of talent and safeguard mechanisms to do the work of the professional title assessment and vocational evaluation.

Strengthen key areas of scientific and technological innovation. Give full play to the Air EPRI and the role of the Civil Aviation two major scientific and technological issues surrounding the development of civil aviation research, and strive to make new breakthroughs in aviation safety, aircraft maintenance, air traffic control, energy saving. Actively promote the "China Civil Aviation the collaborative empty tube technology application demonstration" national major scientific and technological projects, speed up the promotion and application of the airport runway arresting systems and materials research and development of a new generation of arresting. Accelerate the the Beidou satellite technology research in the application of civil aviation, to fight for the lead in the field of general aviation.

("the General Administration of Civil Aviation of China," the original address)
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MR. MA: I’m Dezhi Ma with the Communications Department of the IMF. Joining me today are Mr David Lipton, the First Deputy Managing Director of the IMF; Mr Markus Rodlauer, he’s the Deputy Director of the IMF’s Asia and Pacific Department and also the Mission Chief for China; and Ms Isabelle Mateos y Lago, she’s the Assistant Director of the IMF Asia and Pacific Department and in charge of the spillover discussions with the five systemically important economies, including China; and Steven Barnett, Division Chief for China at IMF’s Asia and Pacific Department.

Without further adieu, I’m going to hand over to Mr David Lipton to make some short opening remarks. We will proceed to take your questions after that. Thank you very much.

MR. LIPTON: Thank you very much. It’s a pleasure to be back here in Beijing on the occasion of our concluding discussions with the Chinese authorities for our 2013 Article IV Consultation. The mission was headed by Markus Rodlauer who is here; as well as our discussion of our spillover report which is headed by Isabelle Mateos y Lago, who is also with us today. I’d like to start by thanking our Chinese hosts for the highly constructive and productive discussions that we’ve had and for their hospitality in welcoming our team here over the last several weeks. I had the privilege of meeting with Vice Premier Ma Kai earlier this week. I had very informative discussions with the People’s Bank of China governor, Zhou Xiaochuan; Finance Minister Lou Jiwei; National Development & Reform Vice Chairman, Liu He, and other Chinese officials over the past three days.

Let me speak a little bit about the economy and our conclusions. Despite weak and uncertain global conditions, the Chinese economy is expected to grow at around 7¾ per cent this year, and at about the same pace next year. It should pick up moderately in the course of the second half of this year, as the recent credit expansion gains traction and in line with the mild pick-up in the global economy that we expect. Inflation is forecast to end the year at around 3 per cent, and the external current surplus is projected to remain broadly unchanged at about 2½ per cent of GDP.
Notwithstanding this relatively favorable near-term outlook, China’s economy faces important challenges. In particular, the rapid growth in total social financing; that’s a very broad measure of credit creation that we’re using. That rapid growth raises questions about the quality of investment and the impact that may have on repayment capacity for companies and for local governments, especially since a fast-growing share of credit is flowing through the newer and less-well supervised parts of the financial system. While good progress has been made with external rebalancing, growth has become more dependent, perhaps too dependent, on the continued expansion of investment, much of it in the property sector and much of it involving local governments whose financial position is being affected as a result. High income inequality and environment problems are further signs that the current growth model needs to adapt.

The Chinese authorities recognize these challenges. The new government which took office in March has announced a set of reforms for 2013 to start addressing these issues. We had good discussions of their reform agenda. In those discussions, they emphasised their intention to embark on comprehensive reforms to ensure a more balanced, inclusive and environmentally friendly growth going forward. While China has significant policy space and financial capacity to maintain stability, even in the face of adverse shocks, the margins for safety are narrowing and a decisive impetus to push forward reform is needed in order to contain those vulnerabilities and move the economy to a safer and more sustainable growth path.

Our dialogue with the authorities has highlighted three broad challenges for the reform agenda. Let me talk about each of the three. First, embedding strong governance in lower-level state or state-related economic institutions, especially banks, state-owned enterprises and local governments. Each of those need improved governance. Second, they need continued liberalization and reduced government involvement, allowing a greater role for market forces in the economy. Third, a decisive push to promote rebalancing; rebalancing toward higher household incomes and higher household consumption. Overall success will depend on effective implementation of all three of these goals. For example, further liberalization of financial markets, which is a desirable end, will not bring the desired efficiency gains, even could be counterproductive in the absence of strengthened fiscal discipline for lenders, for borrowers, and greater accountability in the whole process.

In terms of the main policy areas in this reform agenda, the mission was reassured by the authorities and their focus on the financial sector, fiscal reform, measures to strengthen price signals and improve the framework for a well-functioning marketplace. Reining in total social financing and its growth is a priority that will require further tightening of prudential oversight, and will critically depend on improving investor accountability; investors needs to be accountable for their investment decisions rather than rely on a presumption that their investment returns are guaranteed by the financial institutions or by the government. These policies may slow activity in the short term, but would do so in a way that supports transition to a more sustainable growth path. If growth were to slow below this year’s target, then it would be advisable for there to be on-budget fiscal stimulus focusing on measures that would both support the economy but would do so in a way that support household incomes and consumption, and hence support rebalancing in the economy.
Those measures could include reductions in social contributions, subsidies to consumption, or targeted social safety net spending.

Continued progress with interest rate liberalization and greater exchange rate flexibility will also support rebalancing, and can be accompanied by a gradual and careful opening of China’s external capital account. Our staff’s assessment of China’s external position is broadly unchanged from last year, with the renminbi considered to be moderately undervalued relative to a basket of currencies.

Fiscal reforms are also an integral part of the agenda to support rebalancing, improve governance and raise the efficiency of investment. Including local government financing vehicles, an estimate of the “augmented” general government debt has risen to nearly 50 per cent of GDP, with the corresponding estimate of the “augmented” fiscal deficit now on the order of about 10 per cent of GDP last year. While part of this deficit is financed through land sales and the “augmented” debt is still at a quite manageable level, it’s important over time to gradually reduce the deficit to ensure a robust and sustainable fiscal position and debt profile. Continuing tax reform and a comprehensive re-ordering of local government finances, realigning resources with spending needs and revamping the framework for local government investment and borrowing, those will be key elements of this effort. Shifting part of the very high social security contributions to other forms of taxation would also contribute to rebalancing by reducing the burden on low-wage earners.

A broad range of other structural reforms will support the transition to a more balanced and inclusive growth. Many of these, such as pricing of energy, land and water reforms, are already proposed by the authorities. Allowing more competition in sectors currently considered strategic will help boost growth and boost household incomes. Higher dividends paid by state enterprises to the government would improve their fiscal discipline while contributing to additional fiscal revenue that could be used to support rebalancing.

Taken together, these measures represent a challenging reform agenda. It would take strong determination and administrative capacity on the part of the government to carry out this agenda. The authorities repeatedly emphasized to us that they are fully aware of these challenges and the difficult course ahead. They are aware of the need for a decisive round of reforms to shift the economy onto a more balanced and sustainable growth path. Their success in carrying out these reforms will benefit China, will benefit the rest of the world; and that effect will be very significant given the growing importance of China in the global economy and the growing integration of China with the global economy.

Let me stop with those comments and ask if you have questions. Front row here.

QUESTIONER: Hi, a couple of questions. Firstly, it seems like you’ve downgraded your growth forecast for this year and for next year. So, it would be nice to have a couple of more words on what some of the reasons were for that downgrade. Secondly, you’re estimating “augmented” government debt of 50 per cent of GDP, and last year’s fiscal deficit at 10 per cent of GDP, if I heard you correctly. It would be nice to hear what’s sort of estimates were included in your “augmented” debt and deficit calculations. Thanks.
MR. LIPTON: This is a country where very great attention is paid to 0.1 or 0.2 per cent of growth, given the very high rate of growth. Let’s not lose sight of the fact that China is still growing at a very fast rate. It has been, it probably will be. We’re projecting that growth will remain robust. Now we are projecting, as I mentioned, growth that’s about 7¾ per cent. The change, while modest, comes essentially from looking at the global economy and the pace of growth in the global economy, and the demand that derives from that growth for Chinese exports. Chinese export has been, after years and years of very rapid growth, very slow because of the state of the world economy; and we now are taking our projections of the global economy into account.

We of course continue to look at the official fiscal positions, the official debt of the general government and the deficit of the general government, which is quite modest in its levels. But we think it’s also important to take a broader view as well. We’re not alone in that. The government themselves look at these broader indicators as do many analysts here in China. What we look at includes financing of local governments and spending of local governments around all of China; and it’s an attempt to try to incorporate those in as well. We look at it both from the standpoint of spending and revenues, and from the standpoint of finance; and the attempt here is to try and get a broader and more comprehensive view. But let me say a word or two, as I did in my opening remarks, about local government activities. There’s no question that local government activities support a huge amount of the social services in the economy, and as well carry out many local infrastructure projects - building schools, hospitals, local infrastructure and so on. We are not suggesting that these activities are problematic. In fact, it’s natural that while the economy is in a rapid growth phase, that there would deficit financing, and some support for these very important local activities. But we are trying to develop and focus on this broader measure so that over time there can be transparency and scrutiny of the broader fiscal situation to make sure that the activities that are undertaken are in the national interest and are officially undertaken.

QUESTIONER: Firstly, I’ll follow the line of my colleague here. You downgraded the GDP growth of China. At the same time, you also advised China to rein in social financing. My question is - are you expecting China to grow even slowly further if China take your advice? The second question - you touched upon the interest rate liberalization and the exchange rate regime change, and also the capital account convertibility. Do you think or are you confident, after your discussion with Chinese decision makers, that if China can calibrate all this four - banking, interest rate, exchange rate, capital account convertibility? Can China calibrate the four reforms on four fronts at the same time successfully? And if China can make it to declare that China can convert its capital account by 2015, that is the end of the Twelfth Five-Year Plan?

MR. LIPTON: Thank you. Good questions. Again, let me repeat. We’re projecting that growth in China remains at a very substantial level. Seven and three-quarter’s growth is quite rapid growth by any reasonable standard. We’re not suggesting that credit be restricted right now. What we’re suggesting is that credit growth be watched very carefully, and that there be attention both to the sources of credit and the uses of credit to make sure that the investments that are being undertaken are efficient investments and useful investments for the country. So, in essence, our view is that the fiscal and the monetary policies right now are appropriate to the circumstances, but there are risks that credit expansion could go too
far, could finance investments that turn out not to be sufficiently useful for China, and that there ought to be some attention to that. You’re right in saying that there’s a multi-part agenda for liberalization: liberalization of interest rates, of the exchange rate, of the capital account, and of many prices - energy and other prices across the economy.

We’ve tried to stress, and I think it is important, that when China liberalizes, it also needs to build a strong enough governance structure so that liberalization will lead to the improvements that are warranted; and that governance structure is a very important part of the reform agenda. Governance in this country has traditionally come from the top, but there are now many actors in the economy - banks, non-bank financial institutions, state enterprises, local governments; and each has to have sufficient disciplines that when they receive resources or when they lend resources that they take care about the efficiency of the use of those resources. If governance is sufficient, then liberalization can bring about a better allocation of resources, better use of resources; and we’d like to see those two reforms - governance reforms and liberalization reforms - going hand in hand. I think the question of the timing or the sequencing of reforms is a complex one, and clearly the government is considering reforms in quite a range of areas. I think those reforms do need to advance together. It’s not as though you can simply go down one path all the way and then begin on another. There are good reasons why the liberalization in one area is supported by liberalization in another. Thank you.

QUESTIONER: In the first quarter of the year we saw total social financing rising about 58 per cent from a year earlier, whereas growth slowed from 7.9 per cent in the fourth quarter to 7.7 per cent. A lot of people are worried that that credit is going to pay off old loans. But if you look at the bad loan ratio at the banks, it is now less than 1 per cent. Do you believe that number? Do you think there’s a problem with banks reporting bad loans, their bad loan rates, their actual bad loan rates? Second question is - Japan has embarked on a monetary easing and devaluation, effective devaluation of the currency. Was there much concern from the Chinese leaders you met? Did they express much concern over that, over what Japan’s doing on that front? And do you see major negative impacts on other regional economies from what Japan is doing?

MR. LIPTON: As far as the credit growth is concerned, I think credit is flowing from traditional and new sources, and going to quite a range of uses. I don’t think we’ve identified that there’s any one user that credit is being put to. There’s clearly a lot of infrastructure investment, other forms of investments; probably as you suggest, some adjustments of corporate finance. We don’t have any reason to believe that there are any new problems that have arisen with the accounting of those credits. But we are concerned, as I said earlier, that credit growth could pose a problem in the future if it funds activities that are not bringing enough of an economic benefit to the country.

As far as Japan is concerned, the Japanese government is setting out on a broad programme in order to overcome its deflation and restart growth. That’s a process that they call “Abenomics”. It’s a process that we think is an important one; after twenty some odd years of deflation and low growth, it’s an important one. It is true that the early success that they’ve had in the monetary policy easing of that programme has created some unease in other countries in Asia, in Europe, out of fear that the liquidity creation in Japan would lead
to growth in liquidity elsewhere. We don’t see evidence yet that Japanese policy has led to significant spillovers or capital outflows from Japan, but we are aware of and would be watching -- we are aware of the unease that countries have expressed. We recognize that the Japanese exchange rate has moved significantly since the policy began, and that does have an impact on some countries, especially countries that compete with Japan as suppliers and find their relative competitiveness changed. We don’t think that that’s an issue for China. Certainly we’ve heard here in China some concern about the Japanese policy, but it’s more prospective, the question of what impact this is likely to have. When we look at it, we’re not seeing yet significant impacts on the Chinese economy.

QUESTIONER: Can I have a question on the long-term GDP growth? So, China is quite determined to rebalance its economy with a course of lower GDP growth, but there are also discussions what the number should be. And as Premier Li Keqiang stated yesterday, that China has to keep 7 per cent growth in five to fifteen years in order to get the growth target. So, what is your opinion on this, your predictions in GDP growth in five to ten years? And is there a basic growth figure that it has to be? And what will happen if the growth is below 7 per cent? Thank you.

MR. LIPTON: I think there’s no question that in the medium term the economic growth in China will be lower than the very high peak rates of growth that China has seen at various years over the past decade; and that is largely because the investment phase of growth is bound to wind down, and the ability to absorb people from subsistence farming into the economy is bound to come to an end or approach an end. Now, what the growth rate will be in the future is very uncertain. Our view is that a healthy form of growth for China would include rebalancing of growth from an orientation towards exports to an orientation towards domestic demand, building household incomes, building household consumption. We have no doubt that China can continue to grow at a quite healthy pace. That growth will be based on greater skills in your labour force, greater investment to support balanced growth, and continued technological progress and innovation, but exactly what number of growth will be - is uncertain. I would just say that it seems to us important to promote that rebalancing and promote rapid growth; but in trying to achieve growth, to be careful not to pursue forms of growth that at the end of the day will be unsustainable or unhelpful. In other words, it would be in our view unwise to continue to promote growth through an investment approach that’s geared towards building the export sector because we feel that is a growth model that has run its course; and going down that road is likely to lead more to inefficiency and waste rather than sustainable growth.

QUESTIONER: I have two questions. The first is - how do you view Premier Li Keqiang’s urbanisation strategy, because in the past decade massive investment has driven China’s urbanisation, and there are signs that some local governments are still favouring driving up local investment under the name of urbanisation. If you could have any suggestions to Premier Li, what would that be? The second question is - recently the Chinese Yuan has gained a lot even under the backdrop of the Dollar strength. When you met PBOC chief, Zhou Xiaochuan, did he explain to you whether there’s any change to China’s currency policy and if there’s any timetable for China to widen the Yuan band? Thank you.
MR. LIPTON: Thank you. I think in the area of local government activity and urbanisation, I would say two things. Number one, it is very important that local governments have accountability for the decisions that they’re taking because they will have access to large amounts of resources and be undertaking very important expenditures, important for economic development, important for social development; and it’s important that those decisions lead to a very good and useful and efficient dedication of resources. Second, I would say there’s no question that urbanisation has been a successful part of China’s development strategy, and I think it’s very likely that it will continue to be. There are cities that still need to expand, and there are many people who can be drawn into efficient economic activity in urban areas. I think you’re right that there’s a risk of inefficient local government decisions and there’s a risk of inefficient urbanisation decisions. Therefore it’s important that there be good governance and accountability so that urbanisation can continue to take place but can also lead to efficient economic organisation providing jobs for people, good living standards; and with the proposed changes in the residency permit system, can lead to families having access to the social benefits that will allow their children to have health and education.

Second, you did ask about the renminbi. I don’t want to comment on short-run renminbi issues. I think as we’ve said, in the medium-term it’s important that the economy rebalances from an export orientation to an orientation of building domestic demand. Part of that strategy is boosting household incomes, but another part of that strategy will be having a more flexible renminbi, building the strength of the renminbi market, and seeing a stronger renminbi as time goes by so that the moderate undervaluation is overcome. I’ll stop at that. Thank you very much.
A New Era in Aviation…an IATA special report
June 2012

Chinese aviation has developed beyond all recognition but it is time to raise the bar even higher.

In 1421, before Magellan and Columbus, Chinese Admiral Zheng He is said to have circumnavigated the world, visiting the Americas on the way. If so, China failed to follow up this early exploration, and the prospect of a global trading network was lost.

While China may have lost sight of the potential of seafaring many hundreds of years ago, it is in no danger of repeating the mistake with aviation. Government policy has been very supportive of the industry and, unsurprisingly, it has yielded positive results.

In 2010, 296 million passengers and 11 million metric tons of freight traveled to, within and from China. Air transport, including its role in tourism, contributes around 1% of Chinese GDP. Passengers who arrive by air pump around $7.93 billion (CNY50 billion) into the Chinese economy every year.

Furthermore, 4.8 million Chinese jobs depend on the aviation value chain, with workers in the industry unusually productive—the $51,857 (CNY327,000) generated by the average air transport services employee is 6.4 times higher than the overall average.

The country’s aviation sector has made enormous strides, with rapid progress in e-ticketing and the improvement in safety obvious examples. This trend has continued. In 2011, there were no accidents involving Western-built jets in North Asia.

The government also saw the wisdom in consolidation, bringing major airlines together to rationalize and improve the service to the customer. The result is that the country now houses the biggest airline by market capitalization in the world. Chinese carriers made $22 billion last year, a figure that compares impressively with the overall industry figure for 2011 of $7.9 billion.

Airports galore

The infrastructure boom is touted as testimony to China’s great advance in aviation. According to the Civil Aviation Administration of China, there are plans for 56 new airports before year-end 2016. A further 16 airports will be relocated and 91 facilities will be expanded—numbers far beyond the realms of possibility in Europe or the United States.

Beijing Capital International Airport’s new terminal was delivered, as promised, in time for the 2008 Beijing Olympics. This contrasts with the UK government’s failure to approve a third runway for London Heathrow, which will be besieged by traffic when the 2012 Olympics begin in London. Beijing’s $3.5 billion Terminal 3 is larger than Heathrow’s five terminals combined and can comfortably handle more than 40 million passengers per year.

For good measure, a new runway opened in 2007 to facilitate operations at the new terminal. Clearly, the Chinese government displays a different attitude than the UK government when it comes to the industry and the potential benefits of aviation.

Perhaps the most incredible fact about the Chinese airport boom, though, is that it’s still not enough. Far more airports and terminals are needed if China is to satisfy the projected growth figures and exploit the full social and economic potential of aviation. The assertion is mirrored in the figures. The largest airports—including Beijing, Guangzhou, Shanghai Pudong and Shanghai Hongqiao—handle the majority of the traffic. Of the 877 million additional passengers that will be accommodated by 2015 compared to 2010, 212 million are expected to fly on routes associated with China. The average person in the United States travels by air 1.8 times per year. In China, the average is 0.2 air trips per person per year. “Within the next decade China is expected to reach an average income level of $15,000 per capita,” notes Tony Tyler, IATA Director General and CEO. “Achieving that in China will generate an extra billion annual travelers.”

According to Zhang Baojian, IATA Regional Vice-President, North Asia, there is discussion about whether to allow more commercial aviation at second-tier airports. These are currently managed by the military, but would provide welcome relief in certain areas of the country. These facilities would also help to create further demand and enable smaller airlines to open niche markets. “In 2011, Dragonair recorded a promising performance on Beijing and Shanghai routes,” says Dragonair Chief Executive Officer Patrick Yeung. “There was also considerable growth in passenger numbers in secondary cities such as Hangzhou, Xiamen, and Nanjing.”

The western side of China is in particular need of development. The largest airport in the area is Chengdu Shuangliu, handling 29 million passengers and more than 477,000 tons of cargo in 2011. Its geographic location
means East Asia, South East Asia, and South Asia are within four hours’ flight time, while the Middle East and Europe can be reached in 6–10 hours. With a population of 14 million in the airport’s catchment area, the regional government is working hard to improve international connections and, by the end of 2013, Chengdu could have service with the United States, Canada, Finland, France, Australia (Sydney and Melbourne), and the Middle East (United Arab Emirates and Qatar).

Overall, regional governments are pushing for greater international service. By 2025, 221 Chinese cities will have more than one million residents, according to management consultancy McKinsey. That compares with 35 European cities with populations of more than one million today.

Wherever the development, a level playing field is essential. IATA will monitor the situation regarding industry charges. “We are looking forward to action on previous commitments to close the gap between the airport charges paid by visiting airlines and Chinese airlines,” says Hemant Mistry, IATA Director for Industry Charges, Fuel, and Taxation. “We are also hoping to see jet-fuel prices in China brought down to levels that are more commensurate with that of airports in the region.”

Aviation for the people

Load factors for Chinese carriers are extremely high. The market has been buoyant in 2012, flights are almost always full, and seats can be quite hard to come by. This isn’t all down to numbers, however. Part of it is due to a very efficient distribution system that not only makes the airline product available to China’s vast market, but does it at a fraction of the cost of the western global distribution systems.

TravelSky estimates it is responsible for 94% of Chinese airline tickets, but that this represents just 0.5% of their cost base. One of its goals is to move from its national position to the international stage, embracing technological trends as it does so. TravelSky was the first global distribution system to support IATA’s Electronic Miscellaneous Document in June 2010 and is now looking closely at the mobile online market, which grew to 415 million users in China in 2011. Content as well as channels will be developed. Hotels and other services are already available through TravelSky and there are plans to add many other elements.

With travel becoming increasingly accessible, more aircraft will definitely be needed. Airbus orders are currently the subject of much speculation because of the ongoing row over the European Union Emissions Trading Scheme (EU ETS). Meanwhile, China has its own aircraft manufacturing plans. The C919 has so far received 235 orders. Wu Guanghui, Deputy General Manager of the Commercial Aircraft Corporation of China Ltd. has reported these are mostly from domestic users, but some are from the United States and southeast Asian countries.

The single-aisle passenger jet will be powered initially by advanced LEAP-X1C engines, which are installed in Boeing and Airbus aircraft, but Wu has revealed the Chinese are developing a bespoke engine too. “There will be a choice of two engines for the C919 in the future, and the plane will definitely have a Chinese heart,” says Wu.

As below, so above

Airspace traffic flows—performed by the military in China—could also change in the near future. The Pearl River Delta (PRD) is still the focus for improvements. “Dragonair is aware the authorities in Hong Kong, Beijing and Macau have agreed a plan to reorganize the airspace in the PRD area, and that this plan will be gradually put into effect from now until 2020,” says Yeung. “This reorganization is a vital step in ensuring the efficient growth of all airports in the area.”

Of course, there have been major developments already. IATA worked with the Chinese government to shave about 25 minutes off approaches over mainland China to the PRD. The routes, IATA-1 and IATA-2, save time, fuel, and emissions. Even so, delays can still be extensive for airlines in China, according to Yeung. “When this is viewed against the number of new airports being developed, it is clear future airspace and air traffic control infrastructure needs should not be underestimated,” he says.

IATA’s Zhang notes there is also a proposal to free up airspace below 3,000 meters. “The main beneficiary will be general aviation, but there should be a knock-on effect that will help commercial operations,” he says.

Airspace improvements will help airlines respond to a competitive market. The revolution in China’s high-speed railway could have a big impact on airline sales. China has 13 high-speed railway lines in operation, with another 23 under construction. A further 26 are at the planning stage. By 2020, there will be 10,000 miles of track.

The development of airspace will also enhance environmental mitigation efforts. China will be a leading player in talks about a Seamless Asian Sky and the country is pushing ahead with sustainable biofuels. Air China, Boeing, and Petro China are working on a project.

Connectivity benefits
Zhang also says the Chinese government has earmarked 2020 as a guideline year for beginning Open Sky negotiations. “It is a welcome move, but could be considered too conservative by some,” he adds. The concern about conservatism is based on an understanding of the major role improved connectivity could play in the Chinese economy. If China became truly integrated into the global network it would open up more markets to Chinese exports, lower transport costs, and thereby make its products even more competitive.

Aside from this, connectivity can increase the efficiency of labor supply, speed the adoption of new business practices, and raise productivity levels. For example, Chinese companies could improve in the face of competition from foreign producers and specialize in areas where they have comparative advantage. It is estimated a 10% improvement in connectivity would generate an additional $4.03 billion (CNY25.4 billion) for the Chinese economy.

Improved connectivity also encourages foreign direct investment. This is an area China is keen to encourage and in which it has already enjoyed considerable success. Airbus China, for example, has been investing in the country since the 1990s and employs 300 people. In September 2008, it opened an A320 Final Assembly Line and Delivery Center in conjunction with the Tianjin Free Trade Zone and Aviation Industry Corporation of China.

**Improving service levels**

With the world beckoning, Chinese carriers will have to adapt their image to embrace international norms in service. The Chinese carriers’ profits largely come from premium class domestic travel, a fantastically strong market segment. Significantly, they lose money on most international routes and certainly lose out to international rivals. For journeys from China, Chinese carriers have just 46% of the international and 35% of the cargo market.

“But they are closing the gap and this will allow them to compete on the international level in the near future,” says Zhang. “Creativity and innovation will be the key, and they must also benchmark themselves against competitors and try to replicate, and even improve on, the service levels on offer.”

Despite these challenges, there is no doubt China has made its mark on global aviation. Thanks to a supportive government policy framework China can no longer be bracketed with potential. The future has arrived. The country is already flexing its muscles on international policy, as can be seen in its stand against the EU ETS. Its effectiveness in helping to resolve other concerns, such as security, would then enable it to promote future concepts, such as e-visas.

Nearly 600 years after Admiral Zheng He, China has embraced the world beyond its borders. Air connectivity is helping to power its extraordinary economic expansion.

**Cargo calling**

China is a manufacturing powerhouse. But to get its goods to market, air freight must play a critical role. China is particularly strong in products that have a high value-to-weight ratio, such as electrical components. These are also the very items most companies feel are suited to a just-in-time delivery model. It is very difficult to justify holding expensive inventory in the current economic climate.

Thanks to air cargo, goods can be sent to Europe or the United States far quicker than the 30 days it takes by sea. The fastest growing cargo route in the world is between China and North America, which has grown at more than 10% per annum for more than 15 years. China is now the second-largest air freight market after the United States.
Boeing and China Team Up for Biofuels

August 16, 2012

*Air Cargo World News*

by John McCurry

*Boeing and the Commercial Aircraft Corp. of China have opened a facility in Beijing intended to push forward the development of alternative fuels and other aviation technologies. Employees of the newly minted Boeing-COMAC Aviation Energy Conservation and Emissions Reductions Technology Center will first tackle recycling cooking oil into biofuel. Participants in the facility include Chinese universities and research institutions.*

According to a press release announcing the collaboration, China consumes 29 million tonnes of cooking oil annually, and Chinese planes use about 20 million tonnes of jet fuel.

“Energy conservation emission reduction has currently become the hotspot and focus of the global aviation sector, and our collaboration with Boeing in this regard will have profound impacts in China as well as the world,” COMAC’s Shi Jianzhong said in a statement. “Meanwhile, we wish to construct the new center as a demonstrative advanced technology center and to make contributions to the development of the aviation industry in China and world with the concerted efforts of both sides.”

Boeing and Airbus have been collaborating with carriers for the past few years, running test flights of planes fueled by blends of traditional jet fuel and recycled waste. These tests have successfully shown that there are no issues flying planes powered by cooking oil or a variety of other feedstock. As Boeing’s Terrance Scott told *Air Cargo World* in May, “We’ve now moved beyond the technical feasibility questions. We know it works; we know there’s no engine issues; we know the performance values.”

Scott said at the time that Boeing officials had initiated regional projects all over the world and were working in Australia, Brazil, the United Arab Emirates and Mexico, among other places. In each area, the challenge is to identify appropriate biofuel material and set up supply chains.

“The issue now is not technical, it’s quantity,” he said at the time. “There’s a demonstrated industry demand for these fuels, but there’s not enough to go around.”
Speeding up the Commercialisation and Production of Alternative Aviation Fuel

From Airbus

27 AUGUST 2012

Airbus and one of the world’s leading academic institutions, Tsinghua University have formed a partnership to complete a sustainability analysis of Chinese feedstocks, and to evaluate how best to support the development of a value chain to speed up the commercialisation of aviation bio-fuels. The value chain aims to produce and to promote the use of aviation bio-fuel in China, the world’s fastest growing aviation market.

In phase one, the partnership is assessing suitable feedstocks that comply with ecological, economic and social sustainability criteria. The sustainability analysis is managed by Airbus and involves close collaboration with Tsinghua and leading European institutions. Phase two will narrow down the most promising alternative fuel solutions.

The first results are due to be analysed in the second half of 2012. The goal is to select a number of feedstocks including used cooking oil (which would otherwise be waste) and also algae. By the beginning of 2013, the full sustainability analysis should have been completed.

From 2013 onwards, the partners will look at scaling-up the alternative fuel production process to achieve sustainable quantities of aviation fuel for commercial use.

“We are privileged to be working with our Chinese partners to determine how best we can contribute to a sustainable aviation sector in China” said Frédéric Eychenne, Airbus New Energies Programme Manager. “The commercialisation of alternative fuels is one of the essential ingredients in our quest to achieving ambitious environmental targets in aviation.

"We are grateful to Airbus support for the project." The Project Manager, Professor Zhang Xiliang, Director of Institute of Energy, Environment and Economy, Tsinghua University, said, "the project will help us improve the understanding of the nature of aviation Biofuels commercialisation in China, identify the opportunities and challenges, and evaluate the possibility of social, economic, market and technology change and its cost, obstacles and challenges. We believe that the research will have positive effects on energy conservation, emissions reduction and climate change addressing in Chinese aviation sector."

The partnership agreement is one of the initiatives to develop a complete sustainable aviation bio-fuel production capability in China, using only sustainable resources and is part of the Airbus goal to have in place a value chain in every continent by 2012. So far Airbus has value chains in Latin America, Australia, Europe, the Middle East, and with the Chinese value chain, Asia.
SHANGHAI — For those frustrated with air travel in the United States, arriving at this city’s domestic airport can be a treat.

New arrivals are whisked on electronic walkways through a bright, spacious airport terminal that features elegant lounges, free Wi-Fi, speedy security checks and an efficient baggage handling system.

This is what the best airports now look like in the world’s second-largest economy.

Three years after it opened, Terminal 2 at Hongqiao International Airport in Shanghai stands as a testament to China’s economic ambitions, and to its unique approach to infrastructure development.

With extraordinary government support, Shanghai built a massive airport terminal in 32 months as part of a $9 billion transportation hub that connects the air terminal with the city’s buses, subway platforms and a new high-speed railway network.

“They know how to build things and how to do it efficiently,” said Jeffrey N. Thomas, chief executive of Landrum & Brown, an American firm that helped design the new Shanghai terminal. “That area went from plans on a piece of paper to a complex that has 14 million square feet in less than four years. That’s hard to do.”

At a time when many American airports are falling into disrepair, China is quickening its air travel development, with plans to build nearly 100 more airports by 2015, including some at high altitudes, where special landing gear is required. Many of those airports are expected to lose money, but that hasn’t deterred the government, which views the expansion of infrastructure as vital to economic development.

China’s big-city airports are already colossal. Last year, Beijing Capital International Airport handled 81 million passengers, up from 27 million in 2002.

This year, it could surpass Atlanta’s Hartsfield-Jackson International Airport to become the world’s busiest.

In Shanghai, Pudong Airport — which operates 25 miles east of Hongqiao as the city’s international gateway — has so many flights it plans to add a fourth and fifth runway, something few other airports in the world possess.

The quality and speed with which China builds its big city airports is impressive. But whether China holds any lessons for airport development in America, or Europe for that matter, is unclear, analysts say.
China’s building programs are supported by an authoritarian political system that brooks no challenges. When the government decides to build or expand an airport, there are no public hearings or any public protests of note.

And while economists ponder the long-term consequences of that decision-making process, this country’s leaders push ahead with new megaprojects.

“There’s a pro-investment bias here, partly because the country still has so much surplus labor, which makes it a lot cheaper to build,” said Louis Kuijs, an economist at the Royal Bank of Scotland based in Hong Kong. “And this is a country that knows how to build. Look at the Great Wall!”

Terminal 2 at Hongqiao Airport is one of those “this could only happen in China” developments. With Terminal 1 congested, the city announced plans in 2006 for a new transportation hub to cover 10 square miles, a project that when complete is likely to be the world’s largest transit hub with about 1.1 million passengers a day.

To build it, the city cleared 10,000 residents from a huge plot of land west of Hongqiao by building new apartments for them a few miles away. Because the state owns all land in China, and residents have little bargaining power, local governments and developers often benefit from lower development costs.

And in the case of the transportation hub, once the land was cleared, state-run banks lined up to lend money to the project.

“The relocation and acquiring of land this size, only China can do it,” said Cao Longjin, general manager of Shanghai Rainbow Investments, a state-run company that helped develop the hub. “It’s a miracle.”

When China went on an earlier airport-building spree in the 1980s and early 1990s, things didn’t go quite so smoothly. The airports tended to be poorly designed and minimally functional, and usually lost money.

Now, big cities are flush with cash from a real estate boom. Government officials take part in overseas fact-finding missions, hire international consultants and set up joint ventures that improve the chances that the biggest airports will turn a profit.

In Shanghai, the city’s airport authority helped set up Shanghai Rainbow Investments to develop the new transportation hub and revitalize the area around it. The plan includes a new central business district with towers, five-star hotels and a vast mixed-use commercial project created by the Hong Kong developer Shui On Land. The developer hired the American architect Ben Wood, who designed Shanghai’s popular Xintiandi commercial and entertainment district.

City officials also designed Terminal 2 with profit-making ventures in mind, modeled on airports in London, Hong Kong and Singapore, where terminals double as vibrant shopping malls, packed with duty-free shopping and restaurants.
“We looked at what areas of an airport are profitable and which are typically not profitable,” said Liu Wujun, chief technical officer at the Shanghai Airport Authority and one of the main planners behind Terminal 2. “The areas that tend to be profitable we made as large as possible; the areas not so profitable we made as small as possible.”

The result was smaller roadways alongside the airport (not so profitable), and larger hotels, retail outlets and cargo-processing sections (more profitable).

Atlanta’s airport is one of the world’s most cost competitive, with about 70 percent of its revenue from nonaviation areas like shops and parking. That is Shanghai’s model, Mr. Liu said.

Part of the profitability equation involved lowering the cost of construction. And experts say that comes easier in China, where aggressive building schedules are the norm.

Shanghai, for instance, hired more than 13,000 construction workers to develop the transportation hub and did what many projects here do: it instituted a 24/7 construction schedule. Commuting time was minimal since most of the workers lived on site.

So while Heathrow Airport Terminal 5 in London took nearly six years to build and cost $6.5 billion, Hongqiao’s Terminal 2, roughly the same size, was built in less than half the time for a third of the cost. When it opened in early 2010, Terminal 2 had 80 check-in counters and capacity to handle 300,000 flights a year. Last year, the airport handled 234,000 flights.

Inside, Terminal 2 was also fitted with Starbucks coffee, Armani, Zegna, Hermès and Bulgari stores, a duty-free shopping area and office space for lease. Outside the terminal, a shopping mall that connects the railway station with the airport terminal has been slow to develop. But the government says the terminal is profitable.

With more than 30 million passengers expected to pass through its halls this year, billboard advertising comes at a premium.

But rather than sign a deal to lease out the billboards, the city’s airport authority brokered a potentially more lucrative deal in 2005 by forming a joint venture with JCDecaux, the French outdoor advertising giant, one that gives the airport a majority stake.

An executive at JCDecaux China says the company helped the airport authority plan Terminal 2 with oversize indoor and outdoor advertising displays in mind. Rates in Shanghai, the spokesman said, can be as high as $2 million a year, in some cases higher than rates in the United States or Europe.

Chinese airports have other financing advantages over the United States, like higher landing fees for airlines and mandatory airport construction fees paid by passengers, as much as $13 a flight.

A 1973 law prohibiting airports in the United States from charging passenger fees was changed in 1990. In 2000, the fee was raised to $4.50 a flight, about half as much as China’s fee, though airfares are higher in the United States.
In the United States, there are warnings that the poor state of infrastructure at American airports is likely to hold back the industry, and that one of the impediments is the way government restricts financing options.

“We’re going to have to change the way our airports are regulated in terms of how they finance things and how they put projects in place,” said Greg Principato, president of the Airports Council International North America, which represents the nation’s roughly 450 commercial airports.

Of course, with expansion China’s airports will face tough management challenges, particularly if labor costs rise and air traffic slows. There are also concerns among some analysts who study economic development that China’s airport program is excessive and that the country’s high-speed rail is likely to erode the profitability of airports.

But Mr. Liu, the chief technical officer at Shanghai’s airport authority, jokes about how much more profit-oriented state-owned operators are in China. “The difference between here and the U.S. is that in the U.S., the government manages the nonprofit parts of an airport and gives the profitable parts to the private sector,” he said, laughing. “The U.S. way is more socialist and the Chinese more capitalist.”

John Schwartz contributed reporting from New York.