HKIA is fast approaching its maximum capacity as Hong Kong’s air traffic demand continues to rise. There is a pressing need to develop our airport into a three-runway system (3RS) so that it can continue to serve the people of Hong Kong and strengthen the city’s regional and global competitiveness. While the economic and social contributions of the 3RS are widely understood, AAHK also conducted the most extensive EIA study in Hong Kong’s history to identify the potential environmental impacts of the 3RS and, where necessary, formulate measures to avoid, minimise and mitigate the potential impacts to acceptable levels.
• KEY ACHIEVEMENTS IN 2014/15

West Apron Expansion – completed in July 2015 with 31 aircraft parking stands added

3RS Project – received Environmental Permit from the Director of Environmental Protection and affirmation from the Executive Council of HKSAR Government of the need for the 3RS

• OBJECTIVES AND TARGETS

Midfield Development – scheduled for completion by the end of 2015 to handle 10 million passengers per year

3RS Project – commence works after the Executive Council’s authorisation of the proposals under the Foreshore and Sea-bed (Reclamations) Ordinance and the Town Planning Ordinance, and complete in eight years
Expanding HKIA into a Three-Runway System
- Wilson Fung, Executive Director, Corporate Development, AAHK

Why is there an urgent need to expand HKIA?
A First of all, we have to appreciate that HKIA is a critical piece of infrastructure that brings business, jobs and convenience to the people of Hong Kong. HKIA’s two-runway system is currently operating at over 90% capacity and will reach its maximum practical capacity in 2016 or 2017. Flight movements in 2014 revealed that the actual growth is four years ahead of forecast. This increasing demand for air travel is closely connected to the healthy economic development of our city.

Over the years, AAHK has carried out major enhancement works to expand and upgrade airport facilities to increase handling capacity and improve service quality for both aircraft and passengers on the ground. However, the bottleneck is in the runway, and expanding HKIA into a 3RS is the long-term solution to relieving our current capacity constraints.

What is the scale of the 3RS project and how will it address capacity constraints?
A The scale of the 3RS project is comparable to building a new airport next to the existing one, and it represents the largest and highest-budget single construction project in the city since the establishment of the HKSAR. Major facilities include a new runway, taxiways and aprons, a new passenger concourse, an expanded Terminal 2, an automated people mover system, a baggage handling system, a comprehensive new road network and new transportation facilities.

Upon completion of the project, HKIA will be able to serve 30 million additional passengers annually as forecast in the HKIA Master Plan 2030. The new concourse and the Terminal 2 Expansion could be further developed if necessary, which would accommodate a further 20 million passengers. While we continue to move ahead with the 3RS project, we have also begun working on the HKIA Master Plan 2035 to map out the long-term development needs of HKIA.

How is AAHK striking a balance between airport growth and environmental conservation?
A As we see it, the balance is struck through an open and formally structured collective decision-making process to which the entire community subscribes. Hong Kong’s statutory EIA framework serves as a useful tool in this respect. For the 3RS project, AAHK has prepared the most extensive EIA ever conducted in Hong Kong, culminating in the granting of an Environmental Permit by the Director of Environmental Protection in November 2014. Under the conditions of the Environmental Permit, AAHK will adopt a comprehensive set of measures to manage environmental impacts during the design, construction and operation of the 3RS – more details are covered in this section.
**Strategy for Growth**

With rising air traffic demand, HKIA faces increasing challenges brought by capacity constraints of the existing 2RS, coupled with labour shortage faced by the aviation and logistics industries in Hong Kong.

While the expansion of existing facilities and provision of new facilities, such as the Midfield Development and Terminal 1 Annex Building, will address ground handling capacity, building the 3RS is the long-term strategy to address runway capacity to meet the air traffic demand by 2030 and beyond.

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**Stakeholder Perspectives**

*Dr Peter Lam*, Chairman, Hong Kong Tourism Board:

Excellent connectivity with the rest of the world plays an important part in upholding Hong Kong’s position as a world-class travel destination. Connecting with 180 destinations, HKIA brings visitors from around the globe to Hong Kong. The airport is also the first point of contact between visitors and the city. It therefore plays a crucial role in showcasing the best of Hong Kong – efficiency and superb service quality. To maintain Hong Kong’s status as the region’s leading travel destination and to better serve the needs of visitors, it is necessary to keep enhancing the capacity, facilities and services of the airport.

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**Annual Air Traffic Movements (ATMs) ('000)**

- 2014 throughput - 391,000
- MP 2030 forecast - 390,000 (base case)

**Capacity of 2RS = 420,000 ATMs/year**

Over 90% capacity

Source: AAHK for actual statistics and estimates; IATA Consulting for MP 2030 estimates
Planning and Delivering the 3RS

In November 2014, Director of Environmental Protection of HKSAR Government approved the EIA Report of the 3RS project and issued an Environmental Permit. In March 2015, the Executive Council affirmed the need for the 3RS. Since then, AAHK has been working towards completing all necessary 3RS-related statutory and administrative procedures for the commencement of reclamation after the Executive Council’s authorisation of the proposals under the Foreshore and Sea-bed (Reclamations) Ordinance and the Town Planning Ordinance.

**Planning**

- Environmental Impact Assessment studies
- Associated designs/details

**Approval**

- Environmental Permit - was issued on 7 Nov 2014
- Project cost updates and funding options
- Other statutory requirements

**Implementation**

- Detailed designs/contract documentation
- Land formation
- Construction of related facilities

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**3RS: More than just a third runway**

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Note: Planned layout subject to future changes
### 3RS – Did you know?

<table>
<thead>
<tr>
<th>Component</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total estimated</td>
<td>HK$141.5 billion</td>
</tr>
<tr>
<td>construction cost</td>
<td></td>
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<tr>
<td>Investment in</td>
<td>Up to HK$22 billion</td>
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<tr>
<td>environmental protection</td>
<td>measures</td>
</tr>
<tr>
<td>Reclamation</td>
<td>650 hectares of land</td>
</tr>
<tr>
<td>New runway</td>
<td>3,800m</td>
</tr>
<tr>
<td>New passenger concourse</td>
<td>283,000 sqm, 57 parking positions</td>
</tr>
<tr>
<td>New automated people</td>
<td>2,600m long, 2.5 minutes from T2 to new concourse</td>
</tr>
<tr>
<td>mover system</td>
<td></td>
</tr>
<tr>
<td>Hourly air traffic</td>
<td>Increase from 68 to 102</td>
</tr>
<tr>
<td>movements</td>
<td></td>
</tr>
<tr>
<td>Annual capacity (by 2030)</td>
<td>102 million passengers, 8.9 million tonnes of cargo, 607,000 flight</td>
</tr>
<tr>
<td></td>
<td>movements</td>
</tr>
</tbody>
</table>

### Stakeholder Perspectives

**Professor Raymond So, Dean, School of Business, Hang Seng Management College:**

Strong air traffic growth and stiff competition among airports in the region is putting pressure on HKIA to maintain its leading edge as a premier aviation hub. Our airport needs to have the appropriate infrastructure or we increase the risk of losing traffic to nearby airports. Once we lose them, we will lose them forever. Building the 3RS is the best solution. AAHK’s EIA Report makes it clear that the 3RS project will affect the environment. However, rather than adopting a “do nothing” approach for the sake of the environment, we should undertake sustainable economic development.
Environmental impact and mitigation measures

The EIA study is a key component of the 3RS project and was the most extensive EIA ever conducted in Hong Kong. The EIA was undertaken by an experienced team of local and international experts who spent two years assessing the potential environmental impacts of the project across 12 key aspect areas.

The EIA Report concluded that all potential impacts could be reduced to an acceptable level, subject to AAHK adopting more than 250 measures to avoid, minimise, mitigate and/or compensate for the potential impacts. Following the granting of the Environmental Permit, AAHK has been proactively taking forward its plan to fulfil the commitments made in the EIA Report and to comply with the respective requirements stipulated in the Environmental Permit granted under the EIA Ordinance.

Prior to the construction works, AAHK will focus on various mitigation measures in 2015/16, which include:

- Preparation for commencing the reclamation works – using non-dredge methods, including deep cement mixing
- Setting up a Marine Ecology Enhancement Fund for the conservation of marine life, particularly the Chinese White Dolphin (CWD) within Hong Kong and Pearl River Estuary waters
- Setting up a Fisheries Enhancement Fund to support the fishing industry and enhance fisheries resources in western Hong Kong waters, especially the Lantau waters

AAHK will continue its engagement and promotion efforts to strengthen the public’s understanding of the need and urgency of the 3RS as well as matters of particular interest to the public such as the environmental issues and financial arrangements. Please visit the HKIA website (page 97) for details.

Please refer to the ‘Environment’ section for more details on AAHK’s environmental management approach and performance.
Medium-term Measures to Meet Air Traffic Growth

AAHK has invested over HK$12.5 billion in new facilities to meet medium-term air traffic growth and to maintain service quality and operational efficiency at optimum levels.

West Apron expansion
In July 2015, the West Apron expansion was completed. In addition to a cross-runway vehicular tunnel and related facilities, this project added 31 aircraft parking stands, including 10 maintenance stands and nine cargo stands, which substantially increased aircraft parking capacity on both the maintenance and cargo aprons.

Midfield Development
The Midfield Development is a major project to address capacity constraints under the 2RS. The first phase of the development is scheduled to be completed by the end of 2015. This phase comprises a 105,000-square-meter, five-level Midfield Concourse (MFC) equipped with 20 new parking stands that is connected to Terminal 1 by an extension of the automated people mover. With the capacity to serve an additional 10 million passengers each year, the MFC will make a significant contribution to HKIA’s passenger handling facilities and increase the percentage of aircraft that can be bridge-served.

The scheme design for the second phase of the development, which will provide 10 remote full service passenger wide-bodied aircraft parking stands, was completed in 2014. The second phase is targeted for completion in 2017/18.

Terminal 1 capacity enhancement
While the Midfield Development is expected to relieve the pressure on concourse facilities, AAHK will enhance the handling capacity of passengers and baggage in Terminal 1 to maintain the current service standards. The enhancement works will provide capacity for additional facilities such as baggage reclaim carousels, check-in and security screening facilities and additional passenger services such as retail and catering outlets. Construction is expected to begin in Q2 2016/17 and be completed in phases by Q2 2019/20.
The construction of the new MFC illustrates AAHK’s ongoing efforts to integrate environmental considerations into its strategy for airport growth. The Midfield Concourse Development has received a BEAM Plus Provisional Gold rating and will undergo final assessment upon building occupation.

The sustainable solutions incorporated for energy use and water use are illustrated below.

- Energy balance of east and west façades -

West façade glazing minimised, east façade raised up to increase daylight and views.
**Energy Use**

Energy modelling of the MFC shows lighting energy accounts for almost 30% of energy consumption. The design of a good natural daylight system will reduce artificial lighting demand. The MFC is built along a north-south axis with long façades on both the east and west side allowing daylight to enter through vertical glazing.

Due to lower annual solar heat gains on east-facing façades in Hong Kong, it is possible to increase the glazed area on the east to admit more daylight, at a relatively low solar heat gain penalty. Hence, the east façade of the MFC has been raised up to increase daylight and views while the west façade glazing has been lowered. Performance is further enhanced by incorporating skylights on the roof that face due north. These skylights can block the majority of direct sunlight from the south but allow diffuse light to enter from the north. Intelligent daylight and occupancy controls work in parallel to further optimise performance.

Furthermore, a shading hierarchy has been adopted to reduce solar heat gain, thereby lowering energy consumption by the cooling system.

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**Water Use**

A sustainable water strategy is adopted for the MFC which covers demand reduction, grey water recycling and condensate water harvesting. The aim is to reduce potable water consumption by 30% compared to typical Hong Kong consumption.

Demand reduction is mainly supported by the use of sea water flushing and water-conserving sanitary fittings. Treated grey water and condensate water will be reused in the cooling system of the MFC to further reduce potable water consumption.

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**Shading hierarchy**

1. Reduce Window to Wall Ratio
2. Solar Glazing
3. External Shaded Devices
4. Internal Shading

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**Sustainable water strategy**

1. Eliminate water leakage
2. Reduce water consumption
3. Non potable flush water
4. Water harvesting / recycling