

Important Note

Airport Authority Hong Kong (AAHK) is responsible for preparing the Hong Kong International Airport (HKIA) Master Plan 2030 and commissioning the associated consultancies. At different stages of these consultancies, the consultants produced various documents for AAHK's consideration, culminating in the production of final reports. Where a final report was not produced, the consultants' work was consolidated into the HKIA Master Plan 2030 Technical Report. As the reports were produced at different times, they may contain outdated or inconsistent contents.

The HKIA Master Plan 2030 was not drawn up solely on the basis of the various consultancies commissioned by AAHK, but also has incorporated input from relevant airport stakeholders as well as AAHK's own input on the basis of its solid experience in airport operations. Hence, for any differences between the consultancy reports and the HKIA Master Plan 2030, the latter and the Technical Report should always be referred to.

Airport Authority Hong Kong
July 2011

HKIA Airport Master Plan 2030 Financial Feasibility Assessment

- Financial Advisor Final Report



31 May 2011

Table of Contents

1	Exec	cutive Summary	8
	1.1	Introduction	8
	1.2	Background	8
	1.3	Objectives & Approach	9
		1.3.1 Assessment Objectives	9
		1.3.2 HSBC Review Framework	9
	1.4	Base Case Assumptions	9
		1.4.1 Definition of Base Case Assumptions	9
		1.4.2 Review of Base Case Assumptions	
	1.5	2-Runway Scenario Analysis	11
		1.5.1 Review of Financial Model	11
		1.5.2 Traffic, Capacity Design and CAPEX Assumptions	11
		1.5.3 Review of Other Assumptions	12
		1.5.4 NPV and IRR Analysis	12
		1.5.5 Base Case Pre-financing cash shortfall Analysis	12
		1.5.6 Risk Analysis and Stress Tests	
		1.5.7 Financing Analysis	14
	1.6	3-Runway Scenario	15
		1.6.1 Review of Financial Model	15
		1.6.2 Review of External Reports	15
		1.6.3 Review of Other Assumptions	18
		1.6.4 NPV and IRR Analysis	18
		1.6.5 Base Case Pre-financing Cash Shortfall Analysis	19
		1.6.6 Risk Analysis & Stress Tests	19
		1.6.7 Financing Analysis	22
	1.7	Conclusions	23
2	Back	kground of MP2030 Project	25
	2.1	Introduction	25
	2.2	Background to the MP2030 Scenarios	25
3	Obje	ectives and Approach	26
	3.1	Assessment Objectives	26
	3.2	HSBC Review Framework	
4	Base	e Case Assumptions	29
	4.1	Definition of Base Case Assumptions	
	4.2	Review of Base Case Assumptions	
	1.2	4.2.1 Revenue Assumptions	
		4.2.2 Construction Cost Indexation	
		4.2.3 CPI	
		4.2.4 Cost of Borrowing	
		4.2.5 Dividend Assumptions	
		4.2.6 Other Revenue Assumptions	
		4.2.7 Key OPEX Assumptions	
		4.2.8 Replacement CAPEX	
	4.3	Review of Financial Model	
5	2-Ru	ınway Scenario Analysis	38

MP2030 Financial Advisor Final Report

	5.1	Introdu	action	38
	5.2	Review	v of Traffic, Capacity Design and CAPEX Assumptions	38
		5.2.1	Review of Traffic Forecast	
		5.2.2	Review of Capacity Design	
		5.2.3	Review of CAPEX Estimates	41
	5.3	NPV a	nd IRR Analysis	41
		5.3.1	Calculation Methodology	42
		5.3.2	WACC discount rate	
		5.3.3	NPV and IRR Analysis Results	
	5.4	Base C	Case Cash Shortfall Analysis	
		5.4.1	Base Case Financial Projections	
		5.4.2	Funding Shortfall Methodology	
		5.4.3	Funding Shortfall Cashflows	
	5.5		nalysis and Stress Tests	
	0.0	5.5.1	Traffic Risk	
		5.5.2	Capacity Design Risk	
		5.5.3	CAPEX Risk	
		5.5.4	Construction Cost Indexation	
		5.5. 5	Sensitivity Analysis	
	5.6		ing Analysis	
	5.0	5.6.1	Prudent Debt Capacity Principles	
		5.6.2	Debt Sizing Conclusion	
		5.6.3	· · · · · · · · · · · · · · · · · · ·	
		5.6.4	. Sources of DebtFunding Gap	
6	3-Rı	ınway So	cenario Analysis	56
	6.1	Introdu	action	56
		6.1.1	Introduction	56
	6.2	Review	v of Traffic Forecast	56
		6.2.1	Overview of HSBC Approach to Reviewing Traffic Forecast	56
		6.2.2	Summary of Material Reviewed	
		6.2.3	Overview of IATA Forecasting Approach	57
		6.2.4	Regression Module	
		6.2.5	Adjustment Module	
		6.2.6	Movement Forecast Module	
		6.2.7	IATA Forecast Statistics	
		6.2.8	Traffic Conclusion	
	6.3		v of Capacity Design	
	0.0	6.3.1	Overview of Design Capacity	
		6.3.2	Summary of the Material Reviewed	
		6.3.3	Current Capacity and Design Throughput	
		6.3.4	Preliminary Capacity Design for 3-Runway Scenario	
		6.3.5	Capacity Design Conclusion	
6	6.4		v of CAPEX Estimates	
	0.4	6.4.1		
		6.4.1 6.4.2	Overview of CAPEX Estimates	
		6.4.3	Summary of the Material Reviewed	
			Engineering Consultant Approach	
		6.4.4	3-Runway Scenario CAPEX Estimate	
		6.4.5	Construction Cost Indexation	
		6.4.6	Timing of Construction	64

MP2030 Financial Advisor Final Report

		6.4.7	CAPEX Conclusion	64
	6.5	NPV a	and IRR Analysis	64
	6.6		Case Cash Shortfall Analysis	
		6.6.2	· · · · · · · · · · · · · · · · · · ·	
	6.7	Risk Io	dentification	69
		6.7.1	Introduction	69
		6.7.2		
		6.7.3		
		6.7.4		
		6.7.5		
	6.8	Stress		
	6.9			
7	Con	clusions		86
6.7 Risk Identification 6.7.1 Introduction 6.7.2 Traffic Risk 6.7.3 Preliminary Capacity Design Risk 6.7.4 CAPEX Cost Estimation Risk 6.7.5 Construction Cost Indexation 6.8 Stress Tests				

Table of Charts

Chart 1 - Common Base Case Assumptions	10
Chart 2 - 2-Runway Scenario Expansion Plan	11
Chart 3 - 2-Runway Scenario CAPEX Estimate	12
Chart 4 - Base Case Cumulative Cash Shortfall	13
Chart 5 - Summary of 2-Runway Scenario Sensitivity Analysis	13
Chart 6 - 2-Runway Scenario Cumulative Cashflows	
Chart 7 - HKIA IATA Traffic Forecast	
Chart 8 - 3-Runway Scenario Expansion Plan	16
Chart 9 - Summary 3-Runway Scenario CAPEX Costs to FY2031	
Chart 10 - Base Case Cumulative Cash Shortfall	
Chart 11 - Summary of 3-Runway Scenario Sensitivity Analysis	
Chart 12 - 3-Runway Scenario Cumulative Cashflows	
Chart 13 - Common Base Case Assumptions	
Chart 14 - Comparison of Aeronautical Revenue per Passenger	
Chart 15 - Historical Trends of HKSAR CPI	
Chart 16 - Average Historical CPI in Hong Kong	
Chart 17 - 30-Year US Treasury Yield 1995-2010	
Chart 18 - MP2030 Key Inputs / Outputs Dynamics	
Chart 19 - Passenger Traffic Forecast for 2-Runway System	
Chart 20 - 2-Runway CAPEX Programme	
Chart 20 - 2-Runway CAT LAT Hogramme Chart 21 - Passenger Throughput	
Chart 22 - CAPEX estimates for 2-Runway Scenario	
Chart 23 - IRR Calculation Methodology	
Chart 24 - Incremental Net Cashflows for the 2-Runway Scenario	
Chart 25 - 2-Runway Scenario NPV at Different Discount Rate	
Chart 26 - 2-Runway Base Financial Projections	
Chart 27 - 2-Runway Scenario Base Case Cash Shortfalls	45
Chart 28 - Base Case Cumulative Cash Shortfall	
Chart 29 - Historical Trend of TPI	
Chart 30 - Historical Average TPI (5 year periods)	
Chart 31 - Historical Average TPI (Periods to 2010)	
Chart 32 - Summary of 2-Runway Scenario Sensitivity Analysis	
Chart 33 - S&P's Debt/EBITDA Matrix	51
Chart 34 - Stress Test Results	
Chart 35 - 2-Runway Scenario Cumulative Cashflows	
Chart 36 - IATA Forecast Model	
Chart 37 - IATA Traffic Forecast Adjustment Factors	58
Chart 38 - Summary IATA Traffic Forecasts	
Chart 39 - Diagram of 3-Runway Scenario Expansion Plan	
Chart 40 - 3-Runway Scenario Preliminary Capacity Design	
Chart 41 - Total 3-Runway Scenario CAPEX Estimates (2010 prices)	
Chart 42 - 3-Runway Scenario Airport CAPEX Breakdown	
Chart 43 - IRR Calculation Methodology	
Chart 44 - Incremental Net Cashflows for the 3-Runway Scenario	
Chart 45 - 3-Runway Scenario NPV at Different Discount Rate	66
Chart 46 - Comparison of Asset Cost per Passenger	66
Chart 47 - Base Case P&L	67
Chart 48 - 3-Runway Scenario Base Case Cash Shortfall	

MP2030 Financial Advisor Final Report

Chart 49 - Base Case Cumulative Cash Shortfall	69
Chart 50 - HK GDP Growth Forecast: Global Insights vs. EIU	
Chart 51 - Cumulative HK GDP Growth Forecast: Feb 2009 vs. Feb 2010	
Chart 52 - Summary of Stress Case Parameters and Outputs	76
Chart 53 - Summary of High Case Parameters and Outputs	77
Chart 54 - Illustration of Stress Test Outputs	
Chart 55 - S&P's Debt/EBITDA Matrix	
Chart 56 - Stress Test Results Under Recommended Debt Sizing	
Chart 57 - 3-Runway Scenario Cumulative Cashflows	

Table of Abbreviations

AAHK	Airport Authority Hong Kong
AECOM	AECOM Asia Company Limited
Airport	Hong Kong International Airport
APM	Automated People Mover
ATM	Air Traffic Movement
BHS	Baggage Handling System
CAN	Guangzhou Airport
CAPEX	Capital Expenditure
CLP	CLP Holdings Limited
CPI	Consumer Price Index
DCM	Deep Cement Mixing
DLS	Davis Langdon & Seah Hong Kong Limited
EIA	Environmental Impact Assessment
Engineering Consultant	Mott MacDonald Hong Kong Limited
FA	Financial Advisor
5- Year Plan	Five year financial plan (2010/11 to 2014/15) of AAHK
FSTB	Financial Services and the Treasury Bureau
GDP	Gross Domestic Product
GPRD/PRD	Greater Pearl River Delta
HKCCGAS	The Hong Kong and China Gas Company Limited
HKE	Hongkong Electric Holdings Limited
HKG	The Government of the Hong Kong SAR
HSBC	The Hongkong and Shanghai Banking Corporation Limited
HZMB	Hong Kong - Zhuhai - Macau Bridge
IATA	International Air Transport Association
IRR	Internal Rate of Return
Jacobs	Jacobs China Ltd
Master Plan Consultant	AECOM Asia Company Ltd.
Mott	Mott MacDonald Hong Kong Limited
MP2030	Master Plan 2030
MTR	MTR Corporation Limited
NPV	Net Present Value
OPEX	Operating Expenses
Pax	Passenger
Quantity Surveyor	Davis Langdon & Seah Hong Kong Limited
SZX	Shenzhen International Airport
T2C	Terminal 2 Concourse
THB	Transportation and Housing Bureau
TPI	Tender Price Index
WACC	Weighted Average Cost of Capital

1 Executive Summary

1.1 Introduction

The Hong Kong International Airport ("the Airport" or "HKIA") at Chek Lap Kok has been in operation for over twelve years. Over this period the Airport has experienced significant growth in passenger, cargo and aircraft movements which has resulted in an increasing demand on airport operations and facilities.

In order to establish a viable long term solution to meet the future demand in air traffic at the Airport, the Airport Authority Hong Kong ("AAHK") has initiated the HKIA Master Plan 2030 study ("MP2030") for the development of the Airport up to 2030. The MP2030 is intended to identify all facilities required to support the air traffic forecast demand over the next twenty years.

As part of this process, the AAHK conducted an in-house preliminary financial study of the MP2030 and presented its findings to the AAHK Board in October 2009. Following this presentation, the AAHK Board determined that it would be beneficial for the AAHK to hire an external financial advisor. The AAHK engaged The Hongkong and Shanghai Banking Corporation Limited ("HSBC") to act in the role of financial advisor. This report sets out the findings of HSBC's assessment.

Subsequent to HSBC's report issued in July 2010 and revised in Nov 2010, the AAHK has further refined and updated a number of key assumptions, such as the CAPEX estimate, construction cost indexation and dividend policy. This revised final report has been updated to reflect these changes.

1.2 Background

In 2010, AAHK committed about HKD9.3bn (in nominal¹ prices) to the first phase of the Midfield development that would enable HKIA to serve approximately 60 million passengers per annum by FY2015. Beyond that, HKIA must explore other development options.

The AAHK has constructed two scenarios, the 2-Runway Scenario (Option 1) and the 3-Runway Scenario (Option 2), which represent alternative development strategies for the Airport.

The 2-Runway Scenario involves the further development of the existing Midfield to add additional passenger and cargo handling capacity. The capital cost of the works required up to FY2031 under this scenario is HKD23.4bn in 2010 prices (HKD42.5bn in nominal prices, assuming construction cost indexation in line with the forecasted Hong Kong Tender Price Index ("TPI")) as described in the Section 1.4.1, and will serve to increase throughput at HKIA to 74 million passengers per annum.

The 3-Runway Scenario involves the construction of a third runway along with associated passenger and cargo handling facilities on reclaimed land to the north

-

¹ Money of the day

of the existing airport site. The capital cost of the works required under this scenario up to FY2031 is HKD86.2bn in 2010 prices (HKD136.2bn in nominal prices, assuming construction cost indexation in line with the forecasted Hong Kong Tender Price Index ("TPI")) as described in paragraph 1.4.1 and will serve to increase throughput at HKIA to c. 100 million passengers per annum.

1.3 Objectives & Approach

1.3.1 Assessment Objectives

The scope of HSBC's assignment as defined by the AAHK is as follows:

- Evaluate the financial model and the assumptions developed by the AAHK and the AAHK's MP2030 consultants to ensure the validity of the projections for the MP2030
- Assess the financial feasibility of the MP2030 by performing analytical tests and sensitivity analyses
- Quantify the amount of financing required to undertake the MP2030
- Advise the AAHK on its prudent borrowing capacity, based on its cashflow projections

1.3.2 HSBC Review Framework

HSBC approached the financial feasibility assessment of the MP2030 under the following framework:

- HSBC reviewed the assumptions developed by AAHK and the AAHK's consultants as described in this report
- HSBC reviewed the financial model to ensure that it accurately captured the CAPEX and traffic inputs, as well as other key assumptions from which the cashflow projections were prepared. HSBC also reviewed the logical and mathematical integrity of the financial model
- On the basis of the base case cashflows, HSBC performed a preliminary financial feasibility analysis. This included assessing the NPV and IRR of the standalone project, calculating the base case pre-financing cash shortfall and determining the amount of additional external cash that the AAHK would need to fund the MP2030, after considering the prudent debt capacity of the AAHK
- HSBC also assessed potential deviations from the base case assumptions and constructed sensitivities to evaluate the impact of these deviations on the both pre-financing cash shortfall and financial profile of the AAHK

1.4 Base Case Assumptions

1.4.1
Definition of
Base Case
Assumptions

In order to create a set of financial projections, a set of base case assumptions were developed based on guidance received from the AAHK. These assumptions are consistent across both the 2-Runway and 3-Runway Scenarios.

Chart 1 - Common Base Case Assumptions

Parameters	Base Case Assumptions
Revenue	Airport charges increased at a rate in line with CPI growth, assuming 3% CPI increase per year i.e.15% increase every 5 years, starting in FY2013 Retail revenue per passenger increased with CPI
CPI	As per 5 year plan, 3% per annum thereafter
Traffic growth	In line with IATA's base case traffic forecast (up to the maximum capacity of the Airport infrastructure)
Construction Cost Indexation	The construction cost of the two Scenarios will be indexed from the current estimates in 2010 prices to nominal amounts according to the change in the Hong Kong Tender Price Index ("TPI"), which is forecast to increase by 5% per annum from FY2011-FY2014, 5.5% per annum from FY2015 to FY2020 and 3% per annum thereafter
Cost of Borrowing	6.5% per annum
Dividend	The dividend payout ratio is assumed to remain in line with historic levels at 80% of net income, from FY2012
Routine replacement of fixed assets	AAHK will continue to invest in committed capital projects, such as Phase 1 of Midfield Development and the routine replacement of fixed assets.

1.4.2 Review of Base Case Assumptions HSBC notes that the assumption that the rate of airport charge is roughly equivalent to an annual increase in line with CPI, assuming CPI growth of 3% per annum. HSBC believes that this is reasonable, but notes that the AAHK's charging history has been driven primarily by HKG policy.

With the guidance of the AAHK, it has been assumed that the retail revenue per passenger will grow in line with inflation. HSBC believes that this is a reasonable assumption. CPI has been assumed to increase by 3% per annum based on the AAHK's guidance.

HSBC believes that the assumption that the nominal construction cost of the capital projects will be increase from the current 2010 price estimates in line with the forecasted TPI is reasonable. The applied indexation is consistent with that applied by the HKG in the evaluation of other capital projects, and hence is appropriate for the purposes of this analysis.

The cost of debt has been assumed to be 6.5% per annum. This is higher than the rate at which the AAHK could borrow in the market today but recognises that benchmark rates are currently at historical lows. Given the long construction period, the historical average long term interest rates and credit spreads for borrowers similar to the AAHK, HSBC considers 6.5% to be a reasonable assumption for the average cost of borrowing of the AAHK over the financial projection period.

Based on the guidance of the AAHK, dividends have been assumed to be

declared as per the 5 year plan through to FY2012 and then at 80% of AAHK's net income thereafter. HSBC notes that this level of payout is consistent with the AAHK's historical payout rate.

HSBC notes that the base case assumptions do not necessarily represent the most likely outcome for any individual line of the projections or the projections as a whole. HSBC considers that there is material uncertainty associated with the outcome of many of the key assumptions and that it is likely that one or more of these assumptions will be materially different from that incorporated in the base case forecasts.

As such, there remains a risk that the actual financial results, or future projected results, will be materially different from the base case forecasts. These risks are discussed in detail in Chapter 5.5 and 6.7 and the proposed financing plan reflects the analysis of these risks.

1.5 2-Runway Scenario Analysis

1.5.1 Review of Financial Model HSBC has conducted a review of the 2-Runway Scenario financial model and tested various model functionalities. HSBC has concluded that the model is robust and has been constructed in a logical and consistent manner. HSBC also added certain functionalities to the model to assist in the financial analysis process.

1.5.2 Traffic, Capacity Design and CAPEX Assumptions HSBC has relied on the estimates and forecasts provided by the AAHK in relation to traffic, capacity design and CAPEX for the purposes of the 2-Runway Scenario analysis.

HSBC understands that the traffic estimates were based on forecasts provided by IATA and adjusted by AECOM and the AAHK to reflect the constrained capacity at the Airport under a 2-Runway Scenario. HSBC also understands that capacity design and CAPEX estimates were based on in-house work carried by the AAHK.

Chart 2 - 2-Runway Scenario Expansion Plan

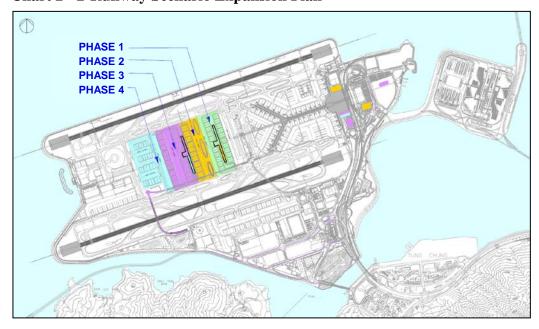


Chart 3 - 2-Runway Scenario CAPEX Estimate

HKDbn, 2010 prices	Phase 1	Phase 2	Phase 3	Phase 4	Total (Phase 2-4)
2-Runway Costs		5.4	8.9	3.8	18.1
Design/Project Costs		0.5	0.9	0.4	1.8
Contingency		1.0	1.7	0.8	3.5
Total 2-Runway Scenario	9.32	6.9	11.5	5.0	23.4

Phase 1 represents the current, committed development of the Midfield.

Under 2-Runway Scenario, the estimated CAPEX spent over the period FY2014 – FY2031 amounts to HKD23.4bn in 2010 prices or HKD42.5bn in nominal terms.

1.5.3 Review of Other Assumptions HSBC has reviewed all of the other assumptions in the financial model. In general, these were found to be sound and based on historical precedents.

1.5.4 NPV and IRR Analysis HSBC has calculated the standalone return from the additional investment in the 2-Runway Scenario as a means of gauging its financial feasibility. To conduct this analysis, HSBC has considered the CAPEX required to increase the throughput of the Airport from approximately 60m passengers at the target service level and 4.3m tonnes of cargo per annum to 74m passengers and 6.0m tonnes of cargo per annum. HSBC has also considered the incremental revenue and costs associated with this increase in throughput as well as an appropriate terminal value. From these cashflows, HSBC has calculated the Net Present Value ("NPV") at various discount rates and internal rate of return ("IRR") of the additional investment in the 2-Runway Scenario.

This analysis shows an IRR for the project of around 6%. Applying a 10% discount rate, which is approximately equal to the AAHK's Weighted Average Cost of Capital (WACC) and also the hurdle rate applied by the AAHK for all capital projections, results in a NPV for the project of negative HKD4bn.

The negative NPV and low IRR leads to the conclusion that the 2-Runway Scenario does not generate a commercial rate of return on a standalone basis.

The negative NPV and low IRR suggest that the project will only be justifiable for the HKG if the 2-Runway Scenario project delivers economic benefits to Hong Kong in addition to the financial returns generated for the AAHK. Such economic benefit analysis is, however, outside the scope of this financial feasibility assessment.

1.5.5 Base Case PreHSBC has analysed the impact of the 2-Runway Scenario on the financial profile of the AAHK as a whole. This methodology is consistent with how debt capital providers would approach the financing of the project.

² In nominal prices.

financing cash shortfall Analysis HSBC has analysed the cumulative pre-financing cash shortfall for the overall business. The cumulative pre-financing cash shortfall is the net additional cash required by the AAHK to meet the costs under the 2-Runway Scenario after consideration of the expected cash surplus arising from the existing business (including CAPEX spent on the committed capital works such as Phase 1 of the Midfield Development and routine replacement of fixed assets) and the payment of dividends, but before considering any additional financing that may be raised.

Chart 4 - Base Case Cumulative Cash Shortfall

FY2014 – FY2031	(HKDbn)
Operating Cashflows ³	163.7
Midfield Phase 1 CAPEX + Replacement CAPEX	(79.5)
Dividend	(79.6)
Net Cashflow after Dividend	4.6
2-Runway Scenario CAPEX	(42.5)
Cumulative Cash Funding Shortfall	(37.9)

This analysis shows the maximum cumulative pre-financing cash shortfall for the AAHK in the base case of HKD37.9bn. This occurs in FY2031, at the end of the construction programme.

1.5.6 Risk Analysis and Stress Tests HSBC recognises the potential for key inputs to differ from the base case assumptions and therefore has analysed the impact of various stress cases on the pre-financing cash shortfall.

Chart 5 - Summary of 2-Runway Scenario Sensitivity Analysis

Chart's - Bui				PARAMETER S			
FY2014	Base case		High CAI	PEX case	Low traffic	No Airport	
- FY2031		High TPI	+10% overrun +20% overrun		case	Charge Increase	
Traffic Forecast	AAHK Base Case	AAHK Base Case	AAHK Base Case	AAHK Base Case	AAHK Low Case	AAHK Base Case	
CAPEX Estimate (2010 prices)	23bn	23bn	25bn	27bn	23bn	23bn	
CAPEX Estimate (Nominal prices)	43bn	48bn	46bn	49bn	43bn	43bn	
Cost Indexation	3.0 - 5.5%	4.0 - 6.5%	3.0 - 5.5%	3.0 - 5.5%	3.0 - 5.5%	3.0 - 5.5%	
Airport Charge Increases	With CPI	With CPI	With CPI	With CPI	With CPI	None	
Cumulative pre- financing cash shortfall (HKD)	38bn	51bn*	41bn	43bn	39bn	45bn*	
Year of peak pre-financing cash shortfall	FY2031	FY2031	FY2031	FY2031	FY2031	FY2031	

^{*}Figures are the cumulative pre-financing funding shortfalls up to FY2031 only

-

³ Includes HKD1bn in pre-financing cash surplus

As shown in the table above, the pre-financing cash shortfall can increase up to HKD51bn in the case of a single parameter downside scenario. In particular, a higher than expected increase in construction cost escalation could have a significant impact on the pre-financing cash shortfall

1.5.7 Financing Analysis HSBC has considered whether the AAHK has the financial ability to undertake the 2-Runway Scenario. As part of this analysis, HSBC has evaluated the debt capacity of the AAHK that would be in keeping with the principle of commercial prudence set out in the Airport Authority Ordinance.

1.5.7.1 Debt Sizing for the AAHK under the 2-Runway Scenario To derive the prudent debt capacity of the AAHK under the 2-Runway Scenario, HSBC has analysed AAHK's cashflow projections and, considering the AAHK's financial objectives, used a range of approaches which take into account the criteria of different financing parties, including capital markets investors and bank lenders. These include:

- Maintaining a high investment grade standalone credit rating in the single 'A' range. This would allow the AAHK to ensure a prudent capital structure and continue to fund itself in the debt capital markets on the reasonable terms. In ensuring that such a rating is maintained, HSBC has considered both the business and financial profile of the AAHK arising as a result of the proposed expansion, and analysed the key financial metrics focused on by rating agencies, such as Debt / EBITDA, cash interest cover and leverage
- Assessing the robustness of financial profile under downside scenarios. In
 evaluating the AAHK's prudent debt capacity, HSBC has considered the
 company's financial profile including the ability to maintain a standalone
 investment grade rating under a number of downside scenarios which
 reflect the uncertainties it faces surrounding CAPEX cost, cost inflation,
 traffic volumes and its ability to implement airport charge increases

As a result of these analyses, HSBC has recommended a prudent debt sizing of HKD26bn. Given that the AAHK already has an average year-end debt balance of HKD9bn, the incremental debt available to the AAHK for 2-Runway Scenario would be HKD17bn. After considering the additional interest cost of this debt of c. HKD4bn, c. HKD13bn of this capacity is available for funding the 2-Runway Scenario.

1.5.7.2 Funding Gap The AAHK has a cumulative pre-financing cash shortfall under the base case of HKD37.9bn of which only HKD13bn can be prudently financed with additional indebtedness. This leaves a funding gap of HKD25bn which will need to be met from other sources.

Chart 6 - 2-Runway Scenario Cumulative Cashflows

FY2014 – FY2031 Cumulative Cashflows	HKDbn (nominal)
Cash surplus from business (after dividends)	5
2-Runway Scenario CAPEX	(43)
Maximum Cumulative Pre-financing cash shortfall	(38)
Additional Debt	17
Net Interest Cost of Additional Debt (post-tax)	(4)
Funding Gap	(25)

The above analysis is predicated on the base case financial projections of AAHK and estimated 2-Runway Scenario construction costs. It shows that 2-runway Scenario cannot be funded through AAHK's internal cashflow and its external prudent borrowing capacity alone. Subject to views gauged on the way forward for the MP2030, further discussions between AAHK and the HKG on how best to bridge the funding gap would be necessary. In practice there are a number of different means by which this funding gap can be met. These include:

- Implementing "User Pay" charges to supplement the AAHK's existing revenues
- Seeking funding support from HKG, including through equity injections and/or a reduction in dividends
- Issuing alternative financing instruments, such as hybrid capital, convertible bonds, subordinated bonds or preferred equity
- Seeking private sector equity financing

These options can be pursued independently or in combination. The optimal choice will depend on the priorities of the AAHK and its stakeholders, in addition to other factors such as credit rating considerations and capital market conditions. For the purposes of this assessment, HSBC has not been asked to consider these options, which will instead be analysed in detail at a later stage.

1.6 3-Runway Scenario

1.6.1 Review of Financial Model HSBC has conducted a review of the 3-Runway financial model and tested various model functionalities. HSBC has concluded that the model is robust and has been constructed in a logical and consistent manner. HSBC also added certain functionalities to the model to assist in the financial analysis process.

1.6.2 Review of External Reports HSBC has reviewed the relevant parts of the reports completed by key MP2030 consultants engaged by the AAHK and held detailed discussions with each consultant. In general, these reports have been completed in a professional manner. The key relevant findings from each consultant as they pertain to the financial feasibility assessment are outlined in the sections below. This section of the Executive Summary also summaries a number of project risks and uncertainties related to the assumptions used in the preparation of the financial projections which are relevant to the financial analysis of 3-Runway Scenario.

1.6.2.1 Review of Traffic Forecast The AAHK appointed IATA to conduct an independent review of passenger traffic, cargo traffic and air traffic movement projections over the MP2030

period. The unconstrained air traffic demand forecast for HKIA estimates that total traffic will reach 97 million passengers per annum and 8.9 million tonnes of cargo by 2030. This represents a CAGR of 3.2% and 4.2% respectively between 2008 and 2030. Air traffic movements will reach 602,000 resulting in a CAGR of 3.2%. A high and a low case traffic case have also been prepared by IATA.

Chart 7 - HKIA IATA Traffic Forecast

	2008	2015	2020	2025	2030	CAGR 08-30
Passenger Numbers (million per annum)	48.6	56.6	68.0	81.8	97.0	3.2%
Cargo Volume (million tonnes)	3.6	4.4	5.6	7.2	8.9	4.2%
Aircraft Movements ('000)	301	347	421	509	602	3.2%

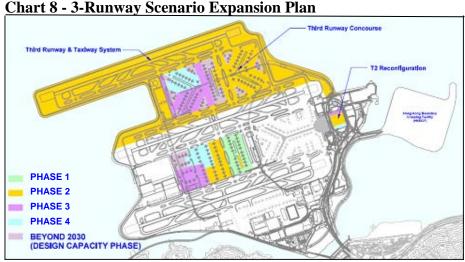
IATA's forecast is based upon a GDP regression analysis which has shown that historical passenger traffic at the Airport has been strongly correlated with real Hong Kong GDP growth. The historical rate of growth for passenger traffic at the Airport is 1.03% for every 1% growth in GDP. IATA has assumed that traffic growth will remain closely correlated with GDP growth over the forecast period (GDP is forecast to increase 3.2% per year from 2008 - 2030).

However, IATA has also recognised that the Airport is experiencing a number of unprecedented competitive influences (e.g. direct links, new alternative modes of transport, and the rapid development of other Pearl River Delta airports) which may result in a deviation of traffic numbers away from that implied by this historical relationship. As such, IATA has made a number of adjustments to take these factors into account.

Based on this approach IATA has forecast that passenger traffic growth will grow at 3.2%, approximately equal to the GDP growth forecast.

A similar methodology has been used for cargo traffic forecast at the Airport.

1.6.2.2 Review of Capacity Design



Phase 1 represents the current, committed development of the Midfield.

The Master Plan Consultant has developed the overall design plan for 3-Runway Scenario to accommodate the traffic forecasts prepared by the Traffic Consultant. The Engineering Consultant has then prepared a preliminary design in part to enable the Quantity Surveyor to conduct a cost estimate.

Under the current preliminary design, the 3-Runway system would be able to support a capacity of 102 aircraft movements per hour or approximately 620,000 aircraft movements per annum (compared with the maximum capacity of 68 movements per hour or 420,000 movements per year under the current two-runway scheme). With a total of 174 passenger stands and 70 cargo stands at HKIA after the implementation of the 3-Runway Scenario, the Airport is expected to be able to handle c. 100m in passenger traffic and 8.9m tonnes of cargo traffic. The plan has been achieved in part through a decision to cross-utilise cargo and passenger stands in the Midfield area and therefore to exclude a provision for contingency passenger stands. HKIA currently operates with 10% contingency passenger stands.

1.6.2.3 Review of CAPEX Estimate HSBC has also analysed the preliminary total CAPEX estimates for the 3-Runway Scenario. Phase 1 represents the current, committed development of the Midfield. Beyond this, the CAPEX estimates include a further three phases up to FY2031.

HSBC has reviewed the original CAPEX estimates compiled by Mott and DLS. These cost estimates were completed based on a combination of comparisons with similar projects in Hong Kong and elsewhere, obtaining preliminary quotes from potential suppliers and benchmarking costs of similar existing facilities at the Airport. Additionally, these cost estimates were also validated by Jacobs at the request of the Highways Department. The scope of work of Jacobs was to conduct an independent assessment on the reasonableness of the 3-Runway Scenario construction cost estimates from Mott's study on the basis of the preferred layout recommended by Master Plan Consultant. Jacobs' findings largely confirmed the original CAPEX estimates, and whilst minor amendments were suggested, the changes in key outputs were modest with differences not more than HKD4bn.

Jacobs' cost recommendations have been adopted by the AAHK and at the AAHK's request, HSBC has also adopted these estimates in its analysis. For the avoidance of doubt, HSBC has not reviewed the analysis undertaken by Jacobs and provides no opinion thereon.

The CAPEX estimates adopted also include:

• Further refinements to the CAPEX estimates to reflect changes to the proposed land formation techniques, largely in light of developments on the Hong Kong Boundary Crossing Facilities (HKBCF) for the HZMB project. HSBC notes that, where appropriate, the costing methodology applied is

consistent with that applied by Mott and DLS. HSBC has reviewed these amendments, though as financial advisor, HSBC has largely relied upon the rationale and associated costs estimates as provided by the AAHK

- Design, site supervision and project management costs at HSBC's request, the AAHK (based on the work of Mott and Jacobs) have provided an estimate of 10% of the construction cost
- A 20% contingency given the early stage of the design process
- Indexation Mott's estimation was based on Q1 2009 prices and HSBC has
 therefore applied appropriate cost price indexation in this analysis. DLS
 advised that these costs are likely to increase roughly in line with Hong Kong
 TPI. Therefore, HSBC has used historic TPI levels to re-base the cost
 estimates in 2010 prices

Additionally, the AAHK has estimated that a further HKD4bn (including design/project costs and contingency) in 2010 prices of CAPEX is required to develop the Midfield in conjunction with the 3-Runway works. At the request of the AAHK, HSBC has included this figure in its analysis without further review.

Chart 9 - Summary 3-Runway Scenario CAPEX Costs to FY2031

HKDbn (2010 prices)	Phase 1	Phase 2	Phase 3	Phase 4	Total (Phase 2-4)
3-Runway Costs	-	48.2	9.1	5.6	62.9
Design/Project Costs (10%)	-	4.8	0.9	0.6	6.3
Contingency (20%)	-	9.6	1.8	1.1	12.6
Total 3-Runway Costs	-	62.6	11.8	7.3	81.7
Additional Midfield Costs (including 10% design/ project costs and 20% contingency)	9.34	2.6	1.3	0.5	4.5
Total 3-Runway Scenario	-		86.2		

Phase 1 represents the current, committed development of the Midfield.

Consequently, the total CAPEX cost of the 3-Runway Scenario has been estimated to be HKD86.2bn in 2010 prices. This figure is equivalent to HKD136.2bn on a nominal basis assuming construction cost indexation in line with forecasted TPI.

1.6.3 Review of Other Assumptions HSBC has reviewed all of the other assumptions in the financial model. In general, these were found to be sound and based on historical precedents.

1.6.4 NPV and IRR Analysis Using the same methodology as described in Chapter 1.5.4 for the 2-Runway Scenario, HSBC has calculated the standalone IRR and NPV for the 3-Runway Scenario. Under this scenario, the throughput of the Airport is increased from approximately 60m passengers at the target service level, 4.3m tonnes of cargo

-

⁴ In nominal prices

and 420,000 ATM per annum to c. 100m passengers, 8.9m tonnes of cargo and 620,000 ATM per annum.

The analysis shows an IRR for the project of around 3% and a NPV of negative HKD43bn. The low return reflects the comparatively high CAPEX required to increase the Airport's throughput by an additional c. 40m passengers per annum by FY2031. The negative NPV and low IRR leads to the conclusion that the 3-Runway Scenario does not generate a commercial rate of return on a standalone basis and will only be justifiable for the HKG if the 3-Runway Scenario project delivers substantial economic benefits to Hong Kong in addition to the financial returns generated for the AAHK. Such economic benefit analysis is, however, outside the scope of this financial feasibility assessment.

1.6.5
Base Case
Prefinancing
Cash
Shortfall
Analysis

Using the same methodology as described in Chapter 1.5.5, HSBC's analysis shows the maximum cumulative pre-financing cash shortfall for the AAHK in the base case to be HKD112.8bn (before considering any costs arising from funding the shortfall for the 3-Runway Scenario). The maximum cumulative shortfall occurs in FY2031 at the end of the construction programme, though the vast majority of this is attributable to the period up to FY2026, during which the bulk of CAPEX is incurred in the land formation process and initial construction of facilities, whilst traffic volumes and revenues are still growing. Between FY2026 and FY2031 the operating cashflows generated by the AAHK are largely able to cover the Phase 4 CAPEX and dividend requirements.

Chart 10 - Base Case Cumulative Cash Shortfall

FY2014 – FY2031	(HKDbn)
Operating Cashflows ⁵	185.4
Midfield Phase 1 CAPEX + Replacement CAPEX	(83.0)
Dividend	(78.9)
Net Cashflow after Dividend	23.4
3-Runway Scenario CAPEX	(136.2)
Cumulative Cash Funding Shortfall	(112.8)

1.6.6 Risk Analysis & Stress Tests As with all business projections, the assumptions upon which these are based are subject to uncertainty. As part of HSBC's analysis, HSBC has identified a number of areas of uncertainty associated with these base case assumptions. An adverse outcome in respect of one of the key assumptions would likely result in an increase in the cumulative pre-financing cash shortfall. HSBC's analysis has sought to establish a prudent financing plan such that the underlying financial profile of AAHK remains robust. HSBC has analysed the key risks to 3-Runway Scenario and developed quantitative stress tests in order to undertake this analysis.

1.6.6.1 Traffic and Passenger Future passenger traffic at the Airport is a key unknown variable which, if lower than projected, could have a material impact on the financial profile of the AAHK. In particular, lower than expected passenger traffic will result in an

⁵ Including HKD1bn in cumulative pre-financing cashflows

Revenue Risk

increased financing requirement due to a lower operating surplus being generated by the Airport and consequently a greater pre-financing cash shortfall. In addition, the lower traffic driven revenue will reduce the AAHK's ability to service its debt.

In analysing the traffic forecasts, HSBC considers the methodology and approach that IATA has taken to be sound. However, there remains uncertainty around some of the key inputs used to develop these forecasts. As such, this same uncertainty exists with the forecasts themselves. Key areas to note are as follows:

- GDP growth forecast whilst traffic growth at major airports has historically been closely correlated with real GDP growth, forecasting future GDP growth is subject to uncertainty and the views of different economists vary materially
- Competition the competitive dynamics between the major airports and alternative modes of transport in the Pearl River Delta are developing rapidly and there remains uncertainty over the long term outcome

As a result of this uncertainty, HSBC has conducted a sensitivity analysis utilising the IATA low traffic case.

1.6.6.2 Construction Cost Overrun Risk Construction cost uncertainty is a major risk for all large infrastructure projects, with a cost overrun potentially resulting in a greater pre-financing cash shortfall.

HSBC has analysed the key risks within the construction program and found the approach taken by Mott and DLS to be professional and well conducted. However, HSBC has noted a number of areas of uncertainty which could cause the actual construction cost to exceed the estimation.

- High level design Costing is based on a Master Plan level (i.e. very high level) while preliminary design and detailed design have yet to be undertaken
- Land reclamation Land reclamation represents a significant proportion of the project cost and much of the land reclamation work requires technologies which have not been widely used before. Additionally, preliminary land formation trials have not yet been conducted
- EIA approval Approval has not been sought nor obtained, and any conditions to the EIA approval could have a material cost impact
- Preliminary quotes DLS has obtained quotes for key work elements and has also obtained historical quotes from other purchasers. This approach is susceptible to cost underestimation due to bidder and purchaser bias
- Risks Certain risks have been identified by Mott's but not priced in the cost estimate

Additionally, HSBC notes that the scope of 3-Runway Scenario has a material bearing on the cost estimation. At this early stage, there remains the risk that design changes could result in substantial increases in the overall project costs.

As a result of these risks, HSBC has recommended running a high CAPEX stress test where CAPEX exceeds the base case assumption by 20%.

1.6.6.3 Construction Cost Indexation Risk Another source of uncertainty for infrastructure projects with long construction programmes is the level of construction price indexation. Higher than expected indexation will result in a greater cumulative pre-financing cash shortfall than under the base case, potentially leading to a stressed financial position for the AAHK.

As noted above, the base case financial assumptions utilise a TPI forecast which is consistent with that applied by the HKG in the evaluation of other capital projects. This forecast shows a 5% increase per annum in TPI from FY2011-FY2014, a 5.5% increase per annum from FY2015 to FY2020 and 3% increase per annum thereafter.

However, TPI in Hong Kong has a history of significant volatility, including extended periods of very high price indexation. For example, whilst the average growth in TPI over the last 20 years has been 3%, over a 25 year period, average TPI growth rises to 5%. Similarly there have been prolonged periods in Hong Kong where the TPI growth has been above 10%.

As such, HSBC has recommended stressing the projections by applying a 1% increase in the forecasted annual rate of increase in TPI.

1.6.6.4 Stress Test Results Chart 11 - Summary of 3-Runway Scenario Sensitivity Analysis

		SINGLE PARAMETER STRESSES				
FY2014 - FY2031	Base case		High CAPEX case		Low traffic	No Airport
		High TPI	+10% overrun	+20% overrun	case	Charge Increase
Traffic Forecast	IATA Base Case	IATA Base Case	IATA Base Case	IATA Base Case	IATA Low Case	IATA Base Case
CAPEX Estimate (2010 prices)	86bn	86bn	93bn	100bn	86bn	86bn
CAPEX Estimate (Nominal prices)	136bn	150bn	147bn	157bn	136bn	136bn
Cost Indexation	3.0 - 5.5%	4.0 - 6.5%	3.0 - 5.5%	3.0 - 5.5%	3.0 - 5.5%	3.0 - 5.5%
Airport Charge Increases	With CPI	With CPI	With CPI	With CPI	With CPI	None
Cumulative pre- financing cash shortfall (HKD)	113bn	133bn	122bn	131bn	117bn	122bn
Year of peak pre- financing cash shortfall	FY2031	FY2031	FY2031	FY2031	FY2031	FY2031

The results of these stress tests, as shown above, demonstrate a range of cumulative pre-financing cash shortfalls of up to HKD133bn for single parameter stresses. The impact on the pre-financing cash shortfall due to low traffic case is relatively minor in comparison with the construction cost stresses (higher construction cost indexation and CAPEX overruns), which result in the pre-financing cash shortfall increasing from HKD113bn under base case assumptions to HKD133bn and HKD131bn respectively.

1.6.7 Financing Analysis HSBC has considered whether the AAHK has the financial ability to undertake the 3-Runway Scenario without additional HKG support. In this analysis, HSBC has focused on constructing a funding plan for 3-Runway Scenario which is consistent with the principle of commercial prudence set out in the Airport Authority Ordinance.

1.6.7.1 Debt Sizing for the AAHK under the 3-Runway Scenario To derive the prudent debt capacity of the AAHK under the 3-Runway Scenario, HSBC has utilised the same methodology as described in Section 1.5.7.1 for the 2-Runway Scenario. Additionally, as the CAPEX spend profile under the 3-Runway Scenario is similar to that of a typical large infrastructure project, HSBC has also applied an approach consistent with that adopted by banks when financing such projects. The methodology assesses the prudent debt capacity on the basis of being able to fully repay debt on the terms and conditions typically offered by lenders to this type of project.

As a result of these analyses, HSBC has recommended a prudent debt sizing of HKD26bn for the 3-Runway Scenario. Given that the AAHK already has an average of HKD9bn of debt outstanding, the incremental debt available to the AAHK for 3-Runway Scenario would also be HKD17bn. After considering the additional interest cost of this debt of c. HKD6bn, c. HKD11bn of this capacity is available for funding the 3-Runway Scenario

1.6.7.2 Debt Sourcing There are a wide range of markets available to the AAHK to source this HKD17bn of incremental debt. These include the USD bond market, Sukuk market, HKD long-dated bond market and the Hong Kong and international bank loan markets.

1.6.7.3 Funding Gap The AAHK has a cumulative pre-financing cash shortfall under the base case of HKD112.8bn of which only HKD11bn can be prudently financed with additional indebtedness. Therefore, the AAHK requires an additional HKD102bn in alternative financing to bridge the remaining funding gap.

Chart 12 - 3-Runway Scenario Cumulative Cashflows

FY2014 – FY2031 Cumulative Cashflows	HKDbn (nominal)
Cash surplus from existing business (after dividends)	23
3-Runway Scenario CAPEX	(136)
Maximum Cumulative Pre-financing cash	(113)
shortfall	
Additional Debt	17
Net Interest Cost of Additional Debt (post-tax)	(6)
Funding Gap	(102)

As described in Section 1.5.7.2, there are a number of different means by which the AAHK can meet this funding gap. Subject to views gauged on the way forward for the MP2030, further discussions between AAHK and the HKG and detailed analysis of the financing options would be required.

1.7 Conclusions

Both the 2-Runway Scenario and 3-Runway Scenario involve significant investment in HKIA in order to allow the Airport to meet forecasted growth (or partially meet in the case of the 2-Runway Scenario) in air traffic whilst still maintaining its target service standards. Given the significant CAPEX required, HSBC's analysis has shown that, under base case assumptions, both the 2-Runway Scenario and 3-Runway Scenario do not generate the a commercial rate of return with both scenarios demonstrating low IRRs and negative NPVs. While the projects may provide benefits to the wider Hong Kong economy, quantifying this benefit does not fall under the scope of HSBC's assignment.

The 2-Runway Scenario contemplates an expansion project within the existing Airport footprint, delivering a smaller increase in throughput at a lower cost. The cost of implementing the 2-Runway Scenario exceeds the Airport's net cashflows during the construction period by HKD37.9bn under base case assumptions. Only HKD13bn if this shortfall can be funded by debt prudently raised by the AAHK. Post debt financing, a funding gap of HKD25bn still remains.

The 3-Runway Scenario represents a larger expansion project, involving the reclamation of additional land. Relative to the 2-Runway Scenario, this scenario is more costly, but almost doubles HKIA's passenger and cargo handling throughput. The significant financial cost of implementing the 3-Runway Scenario exceeds the Airport's net cashflows during the construction period, resulting in a substantial pre-financing cash shortfall of HKD112.8bn in the base case. Based on a prudent sizing of the AAHK's debt capacity, the AAHK can only finance HKD11bn of this through senior debt, leaving a funding gap of HKD102bn.

This funding gap shows that neither the 2-Runway nor 3-Runway Scenarios can be funded through by AAHK's internal cashflow and external prudent borrowing capacity alone. This funding gap can be met through a number of sources, either individually or in combination, including further equity injections from the HKG, reduced dividends to the HKG, additional revenues from the implementation "user-pay" charges, alternative financing instruments and/or private sector equity financing. The optimal choice of these will depend on the priorities of the AAHK and its stakeholders, in addition to other factors such as credit rating considerations and capital market conditions.

HSBC notes that, as with all long term business forecasts, there remain significant uncertainties surrounding a number of the key assumptions, which can result in a material increase in the pre-financing cash shortfall over that shown under the base case. Whilst HSBC has developed a prudent financial profile which allows the AAHK to withstand some stressed conditions, HSBC also note that under more severe, combined downside scenarios, the funding gap will increase and the AAHK will need to seek additional financing to meet this.

HSBC also concurs with the proposed action plan of the AAHK to:

• ensure that the scope of 3-Runway Scenario is consistent with the level of services that the Airport intends to provide

MP2030 Financial Advisor Final Report

• continue to review and refine CAPEX estimates after the planned DCM trials, EIA process and more detailed design work have been undertaken

HSBC recommends that the financial plan for the 3-Runway financial is reviewed and updated in light of the outcome of these trials and other additional work to refine the cost estimates.

2 Background of MP2030 Project

2.1 Introduction

The Hong Kong International Airport ("the Airport" or "HKIA") at Chek Lap Kok has been in operation for over twelve years. Over this period the Airport has experienced significant growth in passenger, cargo and aircraft movements which has resulted in an increasing demand on airport operations and facilities.

In order to establish a viable long term solution to meet the future demand in air traffic at the Airport, the Airport Authority Hong Kong ("AAHK") has initiated the HKIA Master Plan 2030 study ("MP2030") for the development of the Airport up to 2030. The MP2030 is intended to identify all facilities required to support the air traffic forecast demand over the next twenty years.

As part of this process, the AAHK conducted an in-house preliminary financial study of the MP2030 and presented its findings to the AAHK Board in October 2009. Following this presentation, the Board determined that it would be beneficial for the AAHK to hire an external financial advisor. The AAHK engaged The Hongkong and Shanghai Banking Corporation Limited ("HSBC") to act in the role of financial advisor. This report sets out the findings of HSBC's assessment.

2.2 Background to the MP2030 Scenarios

In 2010, AAHK committed about HKD9.3bn (in nominal prices) to the first phase of the Midfield development that would enable HKIA to serve approximately 60 million passengers per annum by 2015. The MP2030 seeks to address the future of Airport beyond this. In doing so, the AAHK has constructed two scenarios, the 2-Runway Scenario (Option 1) and the 3-Runway Scenario (Option 2), which represent alternative development strategies for the Airport.

The 2-Runway Scenario involves the further development of the existing Midfield to add additional passenger and cargo handling capacity. The capital cost of the works required up to FY2031 under this scenario is HKD23.4bn in 2010 prices (HKD42.5bn in nominal prices, assuming construction cost indexation in line with Hong Kong TPI ("TPI")), and will serve to increase throughput at HKIA to 74 million passengers per annum.

The 3-Runway Scenario involves the construction of a third runway along associated passenger and cargo handling facilities on reclaimed land to the north of the existing airport site. The capital cost of the works required under this scenario up to FY2031 is HKD86.2bn in 2010 prices (HKD136.2bn in nominal prices, assuming construction cost indexation in line with TPI) and will serve to increase throughput at HKIA to c. 100 million passengers per annum.

3 Objectives and Approach

3.1 Assessment Objectives

The scope of HSBC's engagement as financial advisor has been set out by the AAHK as follows:

- Evaluate the financial model and the assumptions developed by the AAHK's MP2030 consultants and the AAHK to ensure the validity of the projections for the MP2030
- Assess the financial feasibility of the MP2030 by performing analytical tests and sensitivity analyses
- Quantify the amount of financing required to undertake the MP2030
- Advise the AAHK on its prudent borrowing capacity, based on its cashflow projections

3.2 HSBC Review Framework

To fulfil the terms of its engagement, HSBC has defined and executed a clear and structured approach to the assignment which aims to address each of AAHK's requirements. Details of HSBC's approach and methodology are described below.



Key Objectives

• Evaluate the key assumptions captured in the financial model and verify the basis on which these have been made

As the starting point of its analysis, HSBC has reviewed the existing AAHK financial model. In doing so, HSBC has sought to understand the key drivers behind the Airport's business and assumptions that govern the business' projections out to FY2047. Where applicable, HSBC has adjusted these assumptions based on its experience and analysis, and further dialogue with the AAHK. HSBC has also reviewed the logical and mathematical integrity of the financial model, and checked that the business assumptions have been correctly captured.



Key Objectives

As guided by the AAHK, review the work carried out by the MP2030 Consultants and verify that this reasonable and appropriate for the purposes of the financial analysis

The scope of the 3-Runway Scenario involves a major expansion to the current airport facilities. Consequently, the AAHK has appointed experienced consultants to provide expert review of key inputs into the analysis of this scenario, including traffic, capacity design and construction cost estimates. HSBC has reviewed the reports provided by the following consultants to ensure that the analyses undertaken are consistent and appropriate for a project as substantial and complex as the 3-Runway Scenario.

Traffic Consultant: International Air Transport Association ("IATA") Lead Master Plan Consultant: AECOM International ("AECOM") Engineering Consultant: Mott McDonald Hong Kong Ltd ("Mott")

Additionally, HSBC has also ensured that, where appropriate, the consultants' forecasts are accurately reflected in the financial model.

Conduct
Preliminary
Financial
Feasibility
Assessment of
the
Standalone
Project

Key Objectives

- Establish and agree a base case set of assumptions for further analysis
- Analyse the standalone financial feasibility of the MP2030 project

Having reviewed the key assumptions in the business forecast for the Airport, HSBC has defined and agreed a base case set of assumptions with the AAHK. The agreed assumptions cover landing charges, retail revenues, construction cost indexation, CPI and dividend payout strategy. Subsequently, the AAHK has further refined and updated a number of key assumptions, such as the CAPEX estimate, construction cost indexation and dividend policy. This revised final report has been updated to reflect these changes.

HSBC has used these assumptions to analyse the financial profile, as measured through the NPV and IRR, of the MP2030 on a standalone basis. This analysis has looked at the incremental revenue and expenses accruing from the increase in throughput delivered by the MP2030 in relation to the CAPEX required to achieve this.



Key Objectives

• Evaluate the pre-financing cash shortfall of the MP2030 under these base case assumptions

HSBC has subsequently considered the aggregate financial position of AAHK as a whole i.e. incorporating the cash flow generated from the existing facilities plus the incremental cash flow due to the MP2030. HSBC has determined that the base case pre-financing cash shortfall for the MP2030, which is defined as the net additional cash required by the AAHK to meet the costs under the MP2030 after consideration of the expected cash surplus arising from the existing business and the payment of dividends, but before considering any additional financing that may be raised.

Identify Key Risks and Define Sensitivity Analysis

Key Objectives

- Identify the key areas of risk
- Define and agree key sensitivity cases to be analysed
- Evaluate the impact of these sensitivities on the base case funding requirement

Utilising the detailed review of the key assumptions, HSBC has identified key areas of uncertainty for the MP2030 project. From this risk analysis, HSBC has defined a set of sensitivity cases to assess the impact of possible deviations from the base case assumptions. HSBC has agreed

these sensitivities, which include both upside and downside scenarios, with the AAHK.

HSBC has assessed the impact on the pre-financing cash shortfall generated by the MP2030 under each of these scenarios.

Perform
Financial
Analysis and
Assess
Financing

Structures

Key Objectives

- Determine the prudent debt capacity of the AAHK
- Identify key sources of debt financing
- Determine the additional financial support required, and identify the potential sources of such support

Based on the calculated pre-financing cash shortfall and HSBC's understanding of the financial profile which the AAHK wishes to retain, HSBC has performed a financial analysis targeted at developing the optimal financial strategy for funding the MP2030. This analysis has included the determination of the appropriate debt capacity of the AAHK and the amount of additional financial support required. HSBC has identified potential sources of this support, but has not been asked to consider these in detail for the purposes of this assessment.

4 Base Case Assumptions

4.1 Definition of Base Case Assumptions

In order for HSBC to create a set of financial projections, a set of base case assumptions was developed with guidance from the AAHK. These assumptions are consistent across both the 3-Runway and 2-Runway Scenarios. Assumptions specific to the 2-Runway and 3-Runway Scenarios are discussed separately in Chapters 5 and 6 respectively.

Chart 13 - Common Base Case Assumptions

Parameters	Base Case Assumptions	
Revenue	Airport charges increased at a rate in line with CPI growth, assuming 3% CPI increase per year ⁶ Retail revenue per passenger increased with CPI	
CPI	As per 5 year plan, 3% per annum thereafter	
Traffic growth	In line with IATA's base case traffic forecast (up to the maximum capacity of the Airport infrastructure)	
Construction Cost Indexation	The construction cost of the two Scenarios will be indexed from the current estimates in 2010 prices to nominal amounts according to the change in the Hong Kong Tender Price Index ("TPI"), which is forecasted to increase by 5% per annum from FY2011-FY2014, 5.5% per annum from FY2015 to FY2020 and 3% per annum thereafter	
Cost of Borrowing	6.5% per annum	
Dividend	The dividend payout ratio is assumed to remain in line with historic levels at 80% of net income, from FY2012	
Routine replacement of fixed assets	AAHK will continue to invest in committed capital projects, such as Phase 1 of Midfield Development and the routine replacement of fixed assets.	

Additionally, for the period until FY2010-FY2015, HSBC has assumed revenue and OPEX to be in line with the AAHK 5-year plan (FY2011-FY2015), which has been approved by the AAHK Board.

For the avoidance of doubt, the base case assumptions do not represent HSBC's estimate of the most likely outcome for any individual line of the projections or the projections as a whole.

HSBC considers that there is uncertainty associated with the outcome of many of the key assumptions and that it is likely that one or more of these assumptions will be materially different from that incorporated in the base case forecasts. As such, there remains the risk that the actual financial results, or future projected results, will be materially different from the base case forecasts. These risks are discussed in detail in Chapters 5.5 and 6.7, and the proposed financing plans are based on the analysis of these risks.

-

⁶ Modelled as a 15% increase every 5 years, starting in FY2013

4.2 Review of Base Case Assumptions

4.2.1
Revenue
Assumptions
4.2.1.1
Airport Charges

per Unit

HSBC has reviewed the key revenue assumptions relating to airport charges and retail revenue.

The level of airport charges is an important assumption as airport charges account for a significant proportion of the Airport's revenues (35% of total AAHK revenue in FY2009). This revenue is driven by two key factors, (1) traffic volume and (2) airport charges per unit. HSBC has reviewed traffic volume assumptions in Chapters 5.2.1 and 6.2. This section focuses on airport charges per unit.

Airport charges have three components: landing charges (based on aircraft maximum take-off weight), parking charges (assumed to be a certain % of landing charges based on historical data) and Terminal Building Charges (HKD23 per departing passenger).

As advised by the AAHK, airport charges per unit have been assumed to increase at rate approximately equivalent to an annual rate of increase in CPI, which is forecasted to increase at 3% per annum. HSBC believes that this assumption is reasonable, given the charging history at comparable airports and HKIA's strong competitive position and high quality service offering. Furthermore, IATA has confirmed that, in its professional opinion, moderate increases in airport charges would not materially impact passenger numbers or traffic patterns.

Chart 14 - Comparison of Aeronautical Revenue per Passenger

(in HKD)	2005	2006	2007	2008	2009
Heathrow	85	99	110	130	148
Schipol	114	120	128	139	147
Hong Kong	85	76	80	79	78
Singapore	54	60	61	63	65
Beijing	50	47	46	46	48

Source: Jacobs Consultancy

HSBC does note that the AAHK has never increased charges at HKIA and, in fact, reduced charges by 15% in 2000. In HSBC's view, this behaviour has largely been driven by HKG policy and not the AAHK's economic ability to increase charges.

As airport charges have been, and likely will continue to be, driven by HKG policy priorities and not solely by the Airport's ability to exploit its monopoly position, HSBC has sought guidance from the AAHK as to the appropriate assumptions for airport charges. The AAHK has instructed HSBC to assume, for the purposes of its financial analysis, that the AAHK will increase airport charges at a rate roughly equivalent to the assumed rate of CPI growth. However, as a sensitivity, HSBC has considered a scenario under which airport charges remain constant in nominal terms over the analysis period.

4.2.1.2 Retail Revenue per Passenger Retail revenue accounted for approximately 30% of total AAHK revenue in FY2009 and thus represents a very important component of the AAHK's cash generating ability. Retail revenue is projected by multiplying estimated retail revenue per passenger by the projected passenger traffic number. This methodology is in line with how retail revenue is projected at other airports.

The original financial models assumed that revenue per passenger remained constant in nominal terms beyond FY2015 (after the current five year plan) on the expectation that, over time, the spending power of the Airport's passengers would decrease as the proportion of lower spending travellers from Mainland China increased.

However it was discussed that retail revenue per passenger at other airports has typically increased in line with inflation and that the spending power of travellers did not necessarily correlate with actual spend. For example, despite higher spending power, the business traveller has tended to spend relatively little as a result of spending most of their dwell time in airline lounges.

Following guidance from the AAHK, it was agreed to adjust this assumption so that retail revenue per passenger remained constant in real terms. Hence, HSBC has assumed that, in the base case, retail revenue per passenger will grow by 3% per annum, in line with inflation.

4.2.2 Construction Cost Indexation The construction costs for both the 2-Runway and 3-Runway Scenarios have been provided by the external consultants in 2009 prices. The AAHK has converted the construction costs for both the 2-Runway and 3-Runway Scenarios from 2009 prices to 2010 prices according to the DLS's Hong Kong Tender Price Index during the period. Going forward, DLS have advised that these costs are likely to increase roughly in line with increases in the Hong Kong Tender Price Index ("TPI").

Hence, as guided by the AAHK, for the purposes of the base case financial projections, the estimated construction costs in 2010 prices have been indexed into nominal amounts in line with forecasted TPI. This forecast shows an increase of 5% per annum from FY2011-FY2014, 5.5% per annum from FY2015 to FY2020 and 3% per annum thereafter, and is consistent with the TPI forecast applied by the HKG in the evaluation of other capital projects. However, HSBC notes that there is significant volatility surrounding historical TPI. Consequently, HSBC has analysed the impact of higher construction cost indexation as part of its risk analysis, as described further in Chapter 5.5.4.

4.2.3 CPI

Historical CPI in Hong Kong has been volatile with prolonged periods of substantial inflation. However, since the Asian financial crisis CPI growth has been modest. However, inflation has increased in recent years with a peak of 4.28% in 2008.

Historical Trend of HKSAR CPI

15.0%

Composite CPI

10.0%

5.0%

1980

1985

1990

1995

2000

2005

2010

Chart 15 - Historical Trends of HKSAR CPI

Source: HKG, Census and Statistics Department

The table below lists out the average CPI for different periods of time.

Chart 16 - Average Historical CPI in Hong Kong

Period	Compounded Annual CPI Rate
1981 – 2010	4.37%
1985 – 2010	3.76%
1990 – 2010	2.86%
1995 – 2010	0.74%
2000 – 2010	0.43%
2005 – 2010	2.25%

Source: HKG, Census and Statistics Department

As guided by the AAHK, for the purpose of the MP2030 analysis, HSBC has assumed a 3% increase in CPI per annum beyond FY2015. HSBC believes that this assumption is reasonable, and is consistent with the average increase in CPI over the last 20 years. This level also represents a balance between the very high historic CPI rates and the more moderate rates experienced in more recent times.

4.2.4
Cost of
Borrowing

The USD bond market is the deepest market in the world. As such, it provides the best reference for determining the cost of debt for the AAHK.

The cost of borrowing in USD for the AAHK comprises two elements. These include the level of the underlying Treasury and the premium above the Treasury level that the AAHK would need to pay.

As the result of the extraordinary monetary policy implemented by the Federal Reserve Bank and other central banks globally, interest rates are currently at a historic low. As a result of these current unusual market conditions, the rate at which the AAHK could borrow in the current market may not be a reasonable estimate of the rate it will be able to borrow at throughout the period up to FY2031 during which funding would be required for the MP2030. For the MP2030 financial projections, HSBC has applied a cost of borrowing of 6.5% as

the AAHK's average cost of borrowing based on the long construction period, the historical average long term interest rates and credit spreads for the AAHK and comparable borrowers.

4.2.4.1 Treasury Level The chart below shows that the historical yield on the 30-year USD Treasury since 1995 is 5.3%. As such we have used this level to estimate the Treasury level over the funding period of the MP2030.

Chart 17 - 30-Year US Treasury Yield 1995-2010



Source: Bloomberg

4.2.4.2 AAHK Credit Spread The only currently outstanding AAHK USD benchmark bond is the 5% fixed rate instrument maturing in 2013. The average mid-market spreads for this bond over Treasuries in the secondary market has been 120bps since 2007⁷.

4.2.4.3 Total Cost of Borrowing The sum of the long term treasury level and historic AAHK borrowing cost is approximately <u>6.5%</u>. However, the exact cost of debt will be dependent on a range of factors including the currency and form of the borrowings, the AAHK's capital structure, market conditions and investors' and lenders' perception of the credit.

4.2.5 Dividend Assumptions In accordance with ordinance, AAHK's dividend policy is determined by its board after taking into account all relevant factors including the shareholder's views. In recent years, the AAHK has maintained the dividend payout ratio at about 80% of its distributable profits. However, going forwards, the AAHK Board has not yet determined whether it is appropriate to alter this dividend guideline for this or subsequent periods in light of the MP2030 proposals.

-

⁷ Source: Bloomberg

Nonetheless, in order for HSBC to complete its financial analysis of the MP2030, it was necessary to make an assumption about the AAHK's future dividend policy. As such, the AAHK has directed HSBC, for the purposes of this financial analysis only, to assume a dividend policy where the AAHK maintains the dividend payout ratio at 80%, in line with the historical payout levels.

HSBC notes that if the AAHK Board ultimately decides on a different dividend policy from the one assumed for this analysis, there will be a direct impact both the pre-financing cash shortfall and the size of the additional financial support required by AAHK to complete the MP2030.

4.2.6 Other Revenue Assumptions HSBC has also reviewed the assumptions surrounding other key revenue items (defined as those which account for over 5% of total revenue as of FY2009). The assumptions made for these items for the projection period beyond FY2015 are summarised in the following sections.

4.2.6.1 Passenger Security Charges Passenger security charges accounted for 9% of total AAHK revenue in FY2009. No price increase per passenger is assumed for the projection period.

HSBC considers this assumption to be reasonable.

4.2.6.2 Airport Support Services Total Airport Support Services Revenue accounted for 11% of total AAHK revenue in FY2009. Revenues relating to cargo support services represent the largest single item within this revenue component. The MP2030 projections assume that Airport Support Service Revenue remains constant in real terms, rising in line with CPI.

HSBC considers this assumption to be reasonable.

4.2.6.3 Other Commercial Revenue Other commercial revenue⁸ accounted for 9% of the AAHK's total revenue in FY2009. This revenue is assumed to increase with CPI and in line with forecasts of new area occupancy rates.

HSBC considers this assumption to be reasonable.

4.2.7 Key OPEX Assumptions A number of OPEX assumptions have a material impact on the financial projections of the AAHK. This section discusses the assumptions relating to OPEX items that account for over 5% over total OPEX as at FY2009.

4.2.7.1 Staff Costs Staff Costs accounted for 20% of the AAHK's total expenses in FY2009. In the financial projections, the average cost per staff member is projected to increase in line with CPI. Additional non-project and project staff are assumed to be employed in light of organic growth and MP2030 construction requirements.

HSBC considers these assumptions to be reasonable.

⁸ For the avoidance of doubt, other commercial revenue does not refer to all revenue items not listed above but rather to a revenue line item named, "Other commercial revenue". The additional revenue items not listed above include real estate revenues and other revenue. Each of these is less than 5% of total revenue and has not been discussed above.

4.2.7.2 HKG Charges HKG Charges accounted for 22% of the Airport's total expenses in FY2009. Air traffic control costs are assumed to grow in line with CPI until FY2022. HKG Charges are assumed to grow in line with CPI and in step with the completion of additional facilities.

HSBC considers these assumptions to be reasonable.

4.2.7.3 Security Costs

Security costs accounted for 13% of the AAHK's total expenses in FY2009. Security costs are assumed to grow in line with CPI.

HSBC considers these assumptions to be reasonable.

4.2.7.4 Maintenance Costs

Maintenance costs accounted for 12% of the AAHK total expenses in FY2009. Maintenance costs for existing assets are assumed to grow in line with CPI. For new assets, maintenance costs are projected based on prevailing rates, adjusted for CPI, and the associated capital costs of different types of assets. Synergy factors are also considered in the forecast.

HSBC considers these assumptions to be reasonable.

4.2.7.5 Contract Service Contract Services accounted for 8% of the AAHK's total expenses in FY2009. Contract services expenses for existing facilities are assumed to increase with CPI. Contract services expenses for new facilities are based on incremental space and adjusted by CPI.

HSBC considers these assumptions to be reasonable.

4.2.7.6 Utilities Utilities expenses accounted for 5% of the AAHK's total expenses in FY2009. Utilities expenses for existing facilities are adjusted with CPI. Utilities expenses for new facilities are based on incremental space adjusted by CPI.

HSBC considers these assumptions to be reasonable.

4.2.7.7 Other OPEX Other OPEX⁹ account for 13% of AAHK's total expenses in FY2009. Other OPEX is expected to grow in line with revenue for the projection period which is the average of the 5-year plan (FY2011-FY2015).

HSBC considers these assumptions to be reasonable.

4.2.8 Replacement CAPEX Replacement CAPEX covers the replacement of existing and new assets at the end of their useful lives. The replacement cost is based on initial capital costs, increased with TPI.

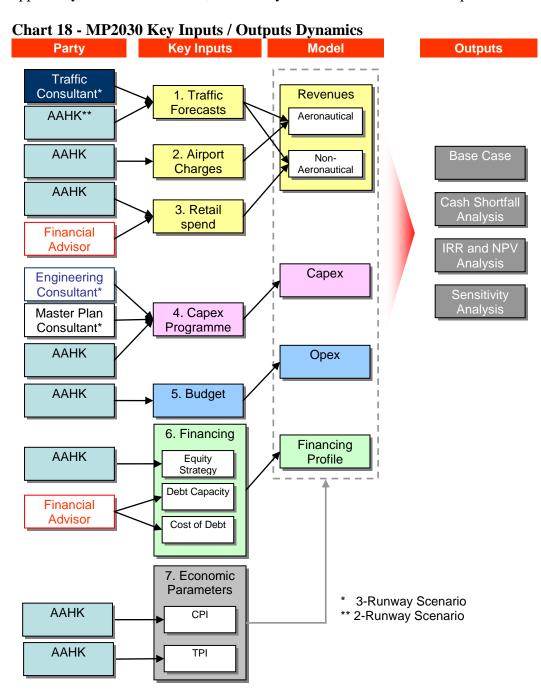
HSBC considers this assumption to be reasonable.

⁹ For the avoidance of doubt Other OPEX does not refer to all OPEX items not listed above but rather to an OPEX line item named "Other OPEX" which refers to other miscellaneous operating expenses and Government rent and rates. These are individually less than 5% of total OPEX and therefore have not been discussed above.

4.3 Review of Financial Model

HSBC conducted a thorough review of the model and tested various model functionalities. This review was supplemented with face-to-face meetings and phone calls with the AAHK personnel responsible for the construction and maintenance of the model. However, it should be noted that HSBC has not performed a model audit.

The main purposes of HSBC's review were to validate the logical integrity of the model and to ensure that the assumptions (outlined in the sections above) were accurately reflected in the model. The diagram below visually describes how the key inputs have been provided, what these key inputs consist of, how they are applied by the financial model, and finally the nature of the model outputs.



HSBC has concluded that:

- The model reflects the 5-year plan of the AAHK (FY2011-FY2015)
- The model reflects the AAHK's internal accounting policies 10
- The model reflects the traffic forecast and CAPEX estimates conducted by external consultants for the MP2030
- The model reflects the assumptions made internally by the AAHK
- The model is robust, accurate and constructed in a logical and consistent manner

The MP2030 financial model is a key tool in performing:

- NPV & IRR Assessment
- Cash Shortfall Analysis
- Sensitivity Analysis
- Financing Plan Analysis

 10 With the exception that land depreciation assumes the renewal of land lease beyond 2047

5 2-Runway Scenario Analysis

5.1 Introduction

The 2-Runway Scenario involves the further development of the existing Midfield to add additional passenger and cargo handling capacity. The base case capital cost of the works required up to FY2031 under this scenario is HKD23.4bn in 2010 prices (HKD42.5bn in nominal prices, assuming construction cost indexation in line with forecasted TPI), and will serve to increase throughput at HKIA to 74 million passengers per annum.

As part of its assignment as financial advisor, HSBC was asked to consider the financial feasibility of the 2-Runway Scenario and advise on whether the AAHK would have the financial resources to complete this development. This section details HSBC's findings and analysis on the 2-Runway Scenario.

5.2 **Review of Traffic, Capacity Design and CAPEX Assumptions**

5.2.1 Review of **Traffic Forecast**

Under the forecasts provided by the AAHK and AECOM for the 2-Runway scenario, traffic growth has been assumed to be the same as IATA's unconstrained forecasts, until the capacity of the 2-Runway system of 420,000 ATM per annum is reached. Beyond this point, the AAHK, in conjunction with AECOM, has forecasted modest additional growth in passenger numbers and cargo volumes despite constrained capacity at the Airport. This is driven by:

- Overall passenger and cargo traffic increasing marginally beyond 70m passengers and 5.6m tonnes cargo to 74m passengers and 6.0m tonnes of cargo per annum through a combination of more efficient bookings, higher load factors and larger planes
- The traffic profile exhibiting a higher proportion of OD passengers relative to TT, as airlines respond to the constrained capacity by focusing more on origination and destination traffic and using the Airport less as a hub airport

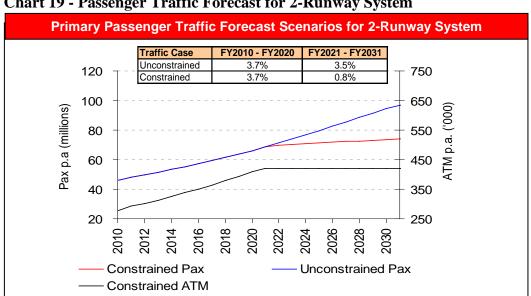


Chart 19 - Passenger Traffic Forecast for 2-Runway System

As advised by the AAHK, HSBC has relied on these assumptions for its analysis and not sought to further verify these forecasts. However, HSBC does note that these assumptions are consistent with those adopted by the AAHK in its economic studies and that the trends assumed have been evident in other capacity constrained airport such as London Heathrow. Additionally, HSBC has reviewed the unconstrained traffic forecasts provided by IATA. Key findings of this review are detailed in Chapter 6.2.

5.2.2 Review of Capacity Design The capacity design for the 2-Runway scenario is driven by the provision of the required infrastructure to handle the forecasted traffic growth whilst maintaining the Airport's targeted service level. HSBC understands that this level of service is a priority for the Airport and has been identified as being fundamental to the Airport retaining its first-in-class status.

Under the proposed 2-Runway system, the capacity design to accommodate the projected traffic volumes of c.70m passengers per annum by FY2022 and 74m passengers per annum by FY2031 is implemented in 4 phases as shown in the chart below. This includes the committed Phase 1 Midfield expansion which is currently underway and due to be completed in FY2016.

PHASE 1
PHASE 2
PHASE 3
PHASE 4

Chart 20 - 2-Runway CAPEX Programme

The timing of the further phases has been scheduled such that the additional facilities become available just in time to meet the required passenger throughput. Phase 2 spans FY2017 – FY2021, Phase 3 spans FY2021 – FY2026 and Phase 4 spans FY2028 – FY2031.

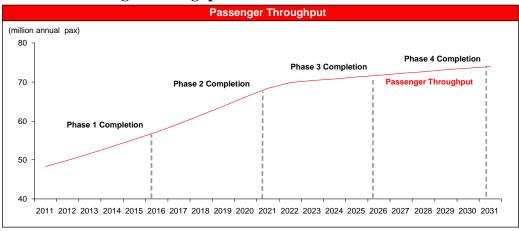


Chart 21 - Passenger Throughput

The proposed capacity design for Phase 2 to 4 includes:

- Expanding Terminal 1 by 4 bays to maintain people density and to provide sufficient kerbside for drop-offs and baggage reclaim belts to meet the target service level
- Providing additional car parking
- Building a new concourse in the Midfield to provide 20 additional frontal passenger stands and 20 additional remote cargo stands
 - All new passenger stands are frontal, to ensure minimal need for bussing and thus meet the target service level
 - No common use stands for mixed cargo and passenger use
 - Additional stands provide a 10% contingency
- Providing APM and BHS for new concourses
 - APM: HSBC understands from the AAHK that the distance from new concourses to arrivals is too long for bussing if the target service level is to be maintained. Therefore, an extension of the existing APM will be required, including 2 new APM platforms for each Midfield concourse, as well as a new APM depot
 - BHS: HSBC understands from the AAHK that a high speed BHS system with Destination Coded Vehicle technology is required in order to maintain service level target (20 minutes for first bag, 40 minutes for last bag). To implement this, the existing North Tunnel would need to be brought into service and extended

HSBC understands that the capacity design was carried out in house. As advised by the AAHK, HSBC has relied on this design and the associated costs for its analysis and not sought to further verify these assumptions. However, HSBC does note the measurement of the level of service is largely subjective and therefore difficult to quantify and verify.

5.2.3 Review of CAPEX Estimates The CAPEX cost estimates provided by the AAHK for the 2-Runway scenario are show in the chart below.

Chart 22 - CAPEX estimates for 2-Runway Scenario

Stages (All in HKDbn, 2010 prices)	Phase 1	Phase 2	Phase 3	Phase 4	Total (Phase 2-4)
Apron Works		0.3	0.6	0.0	0.9
Midfield Concourse		1.0	2.8	1.7	5.5
Terminal 1 Extension		2.7	1.3	1.3	5.4
APM		0.3	1.4	0.1	1.8
BHS		0.4	1.0	0.2	1.6
Infrastructure Works & Utilities		0.7	1.8	0.5	3.0
Subtotal for Each Phase		5.4	8.9	3.8	18.2
Design Fee & Project Management Cost		0.5	0.9	0.4	1.8
Contingency Cost		1.0	1.7	0.8	3.5
Subtotal with Design / Management Cost and Contingency	9.311	6.9	11.5	5.0	23.4
Total Construction Cost with Contingency			<u>23.4</u>		

(The above figures are subject to rounding differences.)

HSBC understands that these estimates were compiled in house. As advised by the AAHK, HSBC has relied on these estimates for its analysis and not sought to further verify these assumptions. However, HSBC understands that the methodology applied for these in-house estimates, along with per unit costs, is comparable to that applied by the external consultants for the 3-Runway Scenario, and whose work has been reviewed by HSBC as described in Chapter 6.4.

HSBC also notes a difference in the scope of the cost estimates provided for the 2-Runway Scenario and the 3-Runway Scenario. For example, the costs of certain items, such as the APM depot, have been included individually in the cost estimate of the 2-Runway Scenario, whilst reflected as part of the 20% contingency in the cost estimates of 3-Runway Scenario. Additionally, under the 2-Runway Scenario, a 10% contingency stands capacity is assumed, whilst no contingency is assumed under the 3-Runway Scenario.

5.3 NPV and IRR Analysis

HSBC has conducted a financial benefit and cost assessment of the 2-Runway Scenario on a standalone basis by analysing the project's NPV and IRR. This analysis assists in the understanding of the financial returns of the 2-Runway Scenario and thus whether the project is generates a commercial rate of return as a standalone investment.

-

¹¹ In nominal prices.

5.3.1 Calculation Methodology HSBC has based its analysis on incremental revenues generated and operating expenses incurred for air traffic beyond the forecasted capacity following the completion of the current Phase 1 Midfield development. The 2-Runway Scenario will incur HKD42.5bn (nominal prices) in CAPEX which will increase the throughput that the Airport can handle from approximately 60m passengers at the target service level, 4.3m tonnes of cargo and 420,000 ATM per annum to 74m passengers, 6.0m tonnes of cargo and 620,000 ATM per annum.

Chart 23 - IRR Calculation Methodology By End of Phase 1 By End of MP2030 HKD42.5bn Expansion **Throughput Throughput CAPEX** at Target Service Level at Target Service Level c. 60m pax per annum 74m pax per annum **Incremental Cashflows** 4.3m tonnes cargo per 6.0m tonnes cargo per annum annum **Incremental Revenues Incremental Costs** Airport charges Staff costs Security charges Government charges Retail and advertising revenue **Utilities** costs Airside support service revenue Contract services costs Other commercial revenue Maintenance costs IT costs Other operating expenses Replacement CAPEX

The incremental cashflows through to FY2047 consist of additional revenues and costs derived from traffic volumes over the forecasted capacity following the Phase 1 Midfield development, as well as from those from the additional facilities opened as part of the 2-Runway Scenario. A terminal value of HKD22bn in FY2047 has been assumed in this calculation, based on a 15x EBITDA (net of replacement CAPEX) multiple. A diagram of the incremental cashflows generated by 2-Runway Scenario is included below.

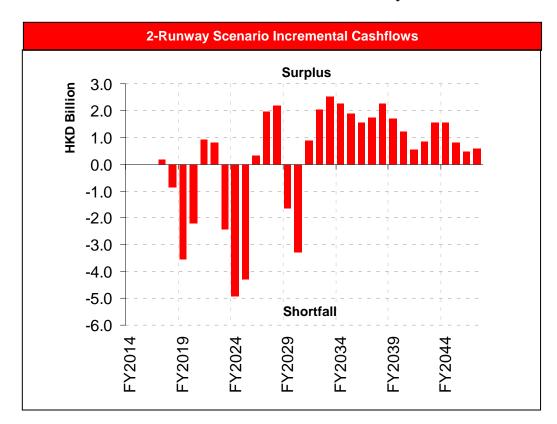


Chart 24 - Incremental Net Cashflows for the 2-Runway Scenario

5.3.2 WACC discount rate To calculate the standalone project NPV, HSBC has used a discount rate of 10%. HSBC believes that this is reasonable and is consistent with the WACC of the AAHK. This figure is also an estimation of the discount rate applied by the AAHK for internal projects, as well as the benchmark applied by the HKG in its evaluation of its commercial investments in major infrastructure projects ¹².

HSBC also notes that in the financial analysis of the West Island Link, a 9% discount rate was applied ¹³ and that the 10% figure adopted for this analysis is largely in-line with the expected IRRs on other transport projects in the region, including ¹⁴:

- Western Harbour Crossing (16.5%)
- Route 3 (CPS) (15%)
- Lantau Link (11.2%)
- Airport Railway (10%)
- New HKIA (5% in real terms 15)

Outside the transport sector, HSBC notes that in the power sector, which represents another regulated infrastructure sector, the recent Scheme of Control Agreements allows a 9.99% permitted rate of return on average net fixed assets (11% for renewable energy fixed assets).

43

¹² "Financing and Financial Benefits of Hong Kong Disneyland" - Finance Bureau, 8 November 1999

¹³ "Funding Support and Essential Public Infrastructure Works of the MTR West Island Line", LC Paper No. CB(1)1758/08-09(01), Legislative Council Panel on Transport Subcommittee on Matters Relating to Railways, Transport and Housing Bureau, May 2009

¹⁴ "LCQ13: Internal rate of return of Infrastructural projects" – Response from Secretary for Transport, Mr. Nicholas Ng, at the Legislative Council, 3 February 1999

¹⁵ Equates approximately to 10% in nominal terms assuming 5% long-term inflation rate

5.3.3 NPV and IRR Analysis Results The 2-Runway scenario shows:

- A negative NPV of HKD4bn over the forecast horizon until FY2047 at a 10% discount rate
- The internal rate of return of 6%

The NPV of the 2-Runway Scenario at discount rates of 0% to 10% are shown in the table below.

Chart 25 - 2-Runway Scenario NPV at Different Discount Rate

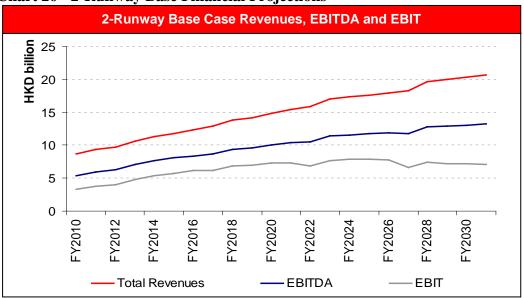
Discount rate	NPV (HKDbn)
0%	29.3
1%	19.8
2%	12.9
3%	7.8
4%	4.0
5%	1.3
6%	-0.7
7%	-2.2
8%	-3.2
9%	-4.0
10%	-4.5

The negative NPV and low IRR leads to the conclusion that the 2-Runway Scenario does not generate a commercial rate of return on a standalone basis.

5.4 Base Case Cash Shortfall Analysis

5.4.1 Base Case Financial Projections The analysis above shows that, on a standalone basis, the 2-Runway Scenario is not financially viable. However, considering the Airport as a whole, in implementing the 2-Runway Scenario, the AAHK still remains profitable throughout the modelling period.

Chart 26 - 2-Runway Base Financial Projections



5.4.2 Funding Shortfall Methodology Although the above chart indicates the AAHK will remain profitable on a before interest and tax basis, it does not address two important factors. These are (1) the significant amount of cashflow that will be needed to fund the substantial CAPEX associated with implementing the 2-Runway Scenario and (2) if AAHK is to receive no further equity support, the increased debt levels and associated interest costs which will be needed to fund this cashflow shortfall. In this section, HSBC evaluates the quantum of the cashflow shortfall.

In this analysis, HSBC has defined the Annual Cash Shortfall as:

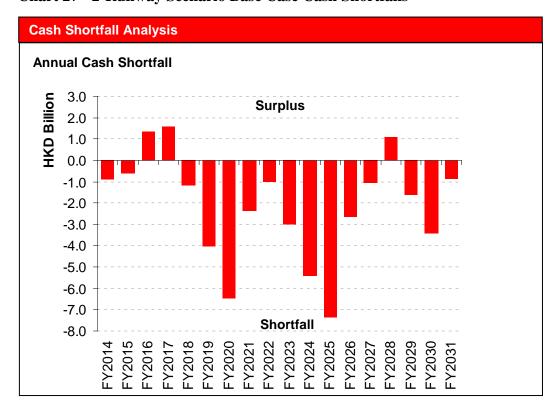
Annual Cash Shortfall

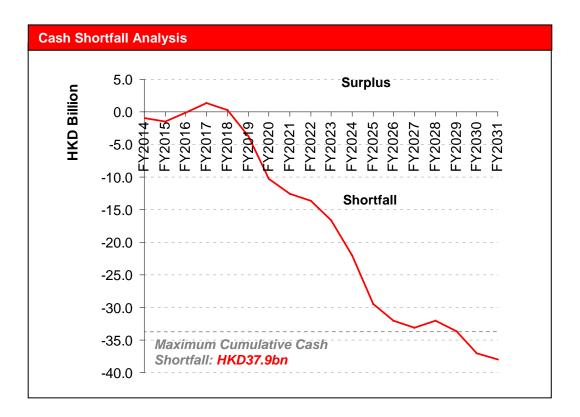
- Operating Cashflows from AAHK (including Midfield Phase 1 CAPEX and replacement CAPEX)
- Interest on Average Year-End Debt Level of HKD9bn
- Dividends
- 2-Runway Scenario CAPEX

The cash shortfall is defined without taking into account any new financing over and above the existing debt.

5.4.3 Funding Shortfall Cashflows The charts below show both the cash shortfall on an annual and cumulative basis which is incurred through implementing the 2-Ruway Scenario. The maximum cumulative cash shortfall can be considered as a measure of the external funding required, excluding any finance costs, to carry out 2-Runway Scenario. Given the relatively even CAPEX spend throughout the construction period, the maximum funding shortfall occurs in FY2031.

Chart 27 - 2-Runway Scenario Base Case Cash Shortfalls





The analysis shows that AAHK will require HKD37.9bn of additional financing (excluding the cost of this financing on any incremental debt) in order to complete the 2-Runway Scenario.

Chart 28 - Base Case Cumulative Cash Shortfall

FY2014 – FY2031	(HKDbn)
Operating Cashflows ¹⁶	163.7
Midfield Phase 1 CAPEX + Replacement CAPEX	(79.5)
Dividend	(79.6)
Net Cashflow after Dividend	4.6
2-Runway Scenario CAPEX	(42.5)
Cumulative Cash Funding Shortfall	(37.9)

5.5 Risk Analysis and Stress Tests

The 2-Runway Scenario represents a significant expansion of the Airport's facilities, the financial analysis of which has required the amalgamation of various assumptions and estimates. In this section, HSBC identifies and highlights some of the key risk areas associated with the 2-Runway Scenario which have the potential to impact the financial position of the AAHK.

Given these risks and the potential uncertainties surrounding key assumptions, HSBC has also undertaken a sensitivity analysis to simulate the financial impact on the AAHK under a number of downside scenarios. The outputs from this analysis provide insight into the robustness of AAHK's business and financial

 $^{^{16}}$ Including HKD1bn cash surplus after dividends from FY2010-FY2013 $\,$

profile under stressed cases and therefore the quantum of debt the AAHK can prudently bear. Additionally, this analysis is also representative of the approach potential debt providers will take when evaluating AAHK's credit.

5.5.1 Traffic Risk The traffic forecasts represent a key cornerstone for the financial analysis of the AAHK. These forecasts form the basis upon which the Airport's expansion timeline has been constructed. Additionally, the traffic forecasts drive the AAHK's revenue. Passenger traffic drives terminal building charge, passenger security charge and retail revenues. Passenger and cargo traffic drive air traffic movements, which is linked to landing and parking charges.

As described in Chapter 5.2.1, HSBC, as requested by the AAHK for the purposes of this analysis, has taken as given the traffic forecast provided by the AAHK. HSBC understands that this forecast was based on the unconstrained traffic forecast provided by IATA and adjusted by the AAHK and AECOM to account for capacity constraints once the maximum throughput volumes are reached.

In Chapter 6.7.2, HSBC highlights some of the intrinsic risks to traffic forecasting as conducted by IATA, and the potential causes of variance to the traffic assumptions adopted. These include risks associated with GDP forecasting, on which the IATA's analysis is based, as well as potential variations in the elasticity of traffic demand with GDP. Additionally, the Airport faces a changing competitive environment, with the effects of direct links between Taiwan and China and increasing competition from GPRD airports and other forms of transport (e.g. the HZMB and the Express Rail), being difficult to predict. However, HSBC notes that the exposure to this variance is reduced in the 2-Runway Scenario relative to that of the 3-Runway Scenario, given that the Airport is assumed to be capacity constrained from an earlier date, and thus less sensitive to long term traffic growth. Additionally, given the staged build out of capacity over 4 phases under the 2-Runway Scenario, the AAHK retains some ability to defer or bring forward the CAPEX schedule in light of actual traffic development.

However, in order to evaluate the robustness of the AAHK's financial profile, HSBC has conducted a sensitivity analysis using a low traffic case based on IATA's low traffic forecasts.

5.5.2 Capacity Design Risk The proposed 2-Runway scenario involves significant expansion and enhancement of existing infrastructure to increase the Airport's capacity whilst retaining the target service level. As highlighted in Chapter 5.2.2, the measurement of service level is largely qualitative and there is a risk that the proposed works are either over or under-designed.

As requested by the AAHK, HSBC has taken as given the capacity design assumptions provided by the AAHK. No specific alternative capacity design scenarios have been evaluated. However, given that capacity design risk could result in higher than expected CAPEX, HSBC has sought to evaluate the potential impact of capacity under-design by conducting a sensitivity analysis on different

levels of CAPEX overrun.

5.5.3 CAPEX Risk

Given the scale and length of the 2-Runway Scenario, the AAHK also faces the risk of underestimating the quantity and costs of numerous works required to implement the expansion project.

HSBC notes that the CAPEX estimates for the 2-Runway Scenario have been produced in-house by the AAHK. HSBC also notes that the proposed scope of work under the 2-Runway CAPEX programme represents a significantly lower risk undertaking than that under the 3-Runway Scenario for which an independent consultant was employed and whose work HSBC has reviewed. However, other risks do still remain including interface risk. Consequently, HSBC has conducted a sensitivity analysis assuming different levels of CAPEX overrun.

5.5.4 Construction Cost Indexation Given the long construction period, the assumption adopted for construction cost indexation has a major impact on the actual cost of construction in nominal terms.

As guided by the AAHK, HSBC has assumed construction cost indexation in line with forecasted TPI. These forecasts show TPI increasing by 5% per annum from FY2011-FY2014, 5.5% per annum from FY2015 to FY2020 and 3% per annum thereafter. However, as the chart below clearly shows, TPI has exhibited significant volatility since 1976 (the earliest records available to HSBC).

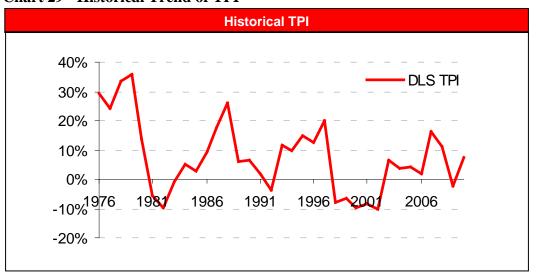


Chart 29 - Historical Trend of TPI

The exhibited volatility is sufficiently high as to make any long term average less meaningful.

Chart 30 - Historical Average TPI (5 year periods)

Period	Compounded Annual TPI Rate
1976-1980	27.1%
1981-1985	-1.7%
1986-1990	12.8%
1991-1995	6.5%
1996-2000	1.1%
2001-2005	-1.0%
2006-2010	6.8%

Chart 31 - Historical Average TPI (Periods to 2010)

Period	Compounded Annual TPI Rate
1976-2010	7.0%
1981-2010	3.9%
1986-2010	5.1%
1991-2010	3.3%
1996-2010	2.2%
2001-2010	2.8%
2006-2010	6.8%

This data suggests a reducing trend in the average level of TPI. The extreme highs of over 30% per annum have not been experienced since the 1970s and sustained periods above 10% have not been experienced since the Asian financial crisis. However, over the past 5 years the compounded annual TPI growth rate is almost 7%, which is higher than that assumed in the base case analysis.

Given the very volatile nature of historic Hong Kong TPI, HSBC believes that it is necessary to stress this parameter within the sensitivity analysis. Under the guidance of the AAHK, a 1% stress has been applied, which HSBC believes to be reasonable. However, given the history of TPI in Hong Kong and the number of large infrastructure projects proposed and planned in Hong Kong, there remains risk to that construction cost indexation could be higher still.

5.5.5 Sensitivity Analysis HSBC has investigated the impact of the various downside scenarios relating to the risks highlighted above on the cumulative cash shortfall from the 2-Runway Scenario. Chart 32 - Summary of 2-Runway Scenario Sensitivity Analysis

		SINGLE PARAMETER STRESSES						
FY2014	Base case		High CAI	PEX case	Low traffic	No Airport		
- FY2031		High TPI	+10% overrun	+20% overrun	case	Charge Increase		
Traffic Forecast	AAHK Base Case	AAHK Base Case	AAHK Base Case	AAHK Base Case	AAHK Low Case	AAHK Base Case		
CAPEX Estimate (2010 prices)	23bn	23bn	25bn	27bn	23bn	23bn		
CAPEX Estimate (Nominal prices)	43bn	48bn	46bn	49bn	43bn	43bn		
Cost Indexation	3.0 - 5.5%	4.0 - 6.5%	3.0 - 5.5%	3.0 - 5.5%	3.0 - 5.5%	3.0 - 5.5%		
Airport Charge Increases	With CPI	With CPI	With CPI	With CPI	With CPI	None		
Cumulative pre-financing cash shortfall (HKD)	38bn	51bn*	41bn	43bn	39bn	45bn*		
Year of peak pre-financing cash shortfall	FY2031	FY2031	FY2031	FY2031	FY2031	FY2031		

^{*}Figures are the cumulative totals up to FY2031 only

As shown in the table above, the pre-financing cash shortfall can increase up to HKD51bn in the case of a single parameter downside scenario.

5.6 Financing Analysis

5.6.1 Prudent Debt Capacity Principles Under Base Case assumptions, the 2-Runway Scenario results in a pre-financing cash shortfall of HKD37.9bn. In order to determine whether the AAHK has the resources to undertake the 2-Runway Scenario without requiring further external support, HSBC has considered whether the AAHK can prudently finance this shortfall by raising debt.

In conjunction with the AAHK, HSBC has established two high-level principles to guide the assessment of whether this is an appropriate level of debt for the AAHK to incur. These principles are:

- 1. The AAHK retaining a prudent financial profile throughout the MP2030 project in accordance with the Airport Authority Ordinance directive for the Airport to be run in a prudent commercial manner
- 2. The AAHK retaining a strong financial standing after undertaking the MP2030

As guided by the AAHK, HSBC has evaluated these principles in the context of the AAHK retaining the ability to finance itself in the debt capital markets on the terms it is historically accustomed to. Key to this ability is the rating the AAHK holds, both on its senior, unsecured debt as well as on a standalone basis. The AAHK's senior debt rating is currently rated AAA by Standard and Poor's

("S&P"), equivalent to the rating carried by the HKG, on the basis of expected support from the HKG as the AAHK's sole owner. The AAHK's standalone rating, which does not consider any implied support from the HKG, is AA-.

HSBC believes that maintain an underlying rating of at least in the single 'A' range would allow the AAHK to comfortably retain its AAA senior, unsecured debt rating, as well as the cost at which it is able to access the debt capital markets.

5.6.1.1 Debt/EBITDA ratio analysis In order to evaluate the AAHK's prudent debt capacity under the 2-Runway Scenario, HSBC has considered S&P's rating metrics¹⁷. In particular, HSBC has focused on the Debt / EBITDA multiple as a key ratio which drives the rating analysis.

Chart 33 - S&P's Debt/EBITDA Matrix

Debt .	/ EBITDA	<1.5x	1.5-2x	2-3x	3-4x	4-5x	>5x
Finan	cial Profile	Minimal	Modest	Inter- mediate	Significant	Aggressive	Highly Leveraged
	Excellent	AAA	AA	A	A-	BBB	
SS es	Strong	AA	A	A-	BBB	BB	BB-
Business Profile	Satisfactory	A-	BBB+	BBB	BB+	BB-	B+
Sus Pro	Fair	-	BBB-	BB+	BB	BB-	В
Щ.	Weak	-	ı	BB	BB-	B+	B-
	Vulnerable	-	-	-	B+	В	CCC+

Source: S&P 2008 Corporate Criteria: Analytical Methodology

Given the Airport's operational status and the strong competitive advantage it holds in the region, S&P's currently views the AAHK's business profile as "Excellent."

Under the 2-Runway Scenario, HSBC has conservatively assumed that the AAHK's business profile may weaken from the "Excellent" to the "Strong" category as a result of:

- 1. HKIA losing its status as one of the key international hub airports for the Asia region as a result of constrained capacity. Under a capacity constrained scenario, the AAHK believes that the HKIA's competitive advantage could be materially eroded relative its expanding competitors in the GPRD
- 2. A capital intensive, highly complex and long-term project which might expose AAHK to significant business risk

Given a 'strong' business profile, the AAHK would need to maintain a Modest to Intermediate financial profile to achieve a strong investment grade standalone rating. Taking this to correspond to a rating in the middle of the 'single A' range, this would be consistent with a maximum Debt/EBITDA ratio of 2.0x. As described in Section 5.4.3, the cumulative cash shortfall increases to a maximum

^{1&#}x27;

¹⁷ HSBC has focused on S&P's rating analysis as S&P currently rate the AAHK. However, HSBC's preliminary analysis shows that the application of the Moody's 2008 rating methodology "Operational Airports outside of the United States", would give a result consistent with that derived under the S&P approach described

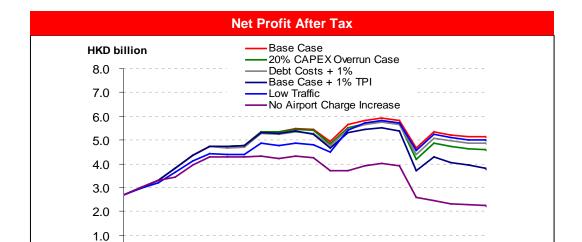
in FY2031 when construction is completed. At this point, the AAHK's projected EBITDA under base case assumptions in HKD13bn. Applying a 2.0x Debt/EBITDA multiple implies a prudent debt capacity of HKD26bn.

5.6.1.2 Sensitivity Analysis In order to evaluate the robustness of the AAHK's financial profile under the prudent debt capacity calculation above, HSBC has also considered the impact of various potential downside scenarios on the rating of the AAHK. These downside scenarios represent single-parameter stresses which are consistent with those shown in Section 5.5.5.

In this analysis HSBC has assumed a base case capital structure that involves the AAHK maintaining a maximum debt level of HKD26bn. To test the AAHK's financial robustness under downside scenarios, it is assumed that the AAHK will seek to fund the escalating financing shortfall through additional borrowing. For such funding to be available, the AAHK must retain a financial profile conducive to debt capital raising. HSBC has defined this profile as:

- Remaining profitable
- Being consistent with a standalone investment grade rating (i.e. BBB- or higher). The retention of an underlying investment grade rating is a critical element in the rating agencies assessment of the likelihood of HKG support¹⁸, as well as investor perception of the credit. A fall to beneath investment grade would potentially impact the ability of the AAHK to access the debt capital markets at an acceptable cost.

In terms of the latter, HSBC has assessed this with reference to the financial ratios required for specific rating levels as defined under S&P's Corporate Criteria. As discussed in Section 5.6.1.1, a business profile of "Strong" is assumed.



FY2020

FY2025

FY2030

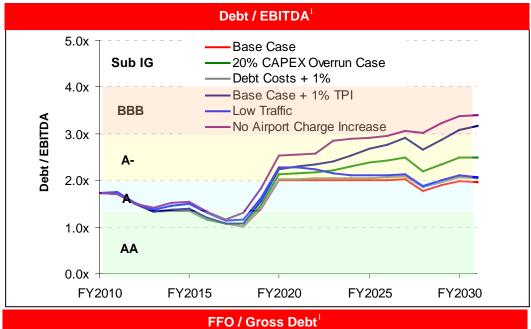
Chart 34 - Stress Test Results

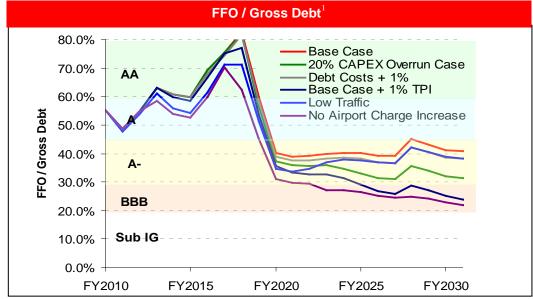
FY2010

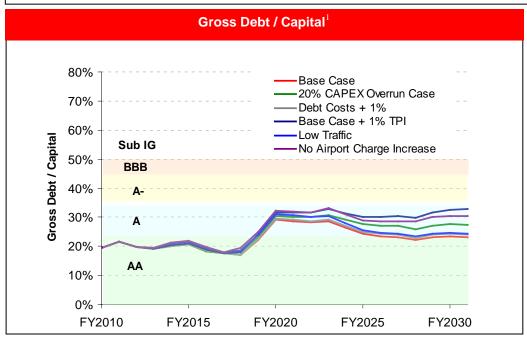
_

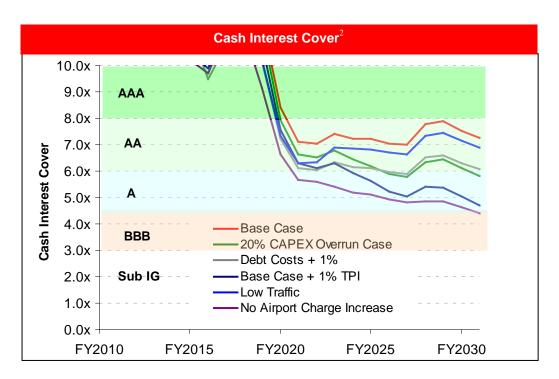
FY2015

¹⁸ S&P Research Update "Airport Authority Hong Kong 'AA+' Rating Affirmed On Revised GRE Methodology; Off CreditWatch Negative" – October 2009: "We could reassess the government's likelihood of extraordinary support, in case a sharp deterioration in AAHK's financial profile results in the ratings being lowered to speculative-grade"









¹ Illustrative rating levels defined according to S&P's 2008 Corporate Criteria: Analytical Methodology, assuming a "Strong" financial profile

As shown in the charts above, the results of this analysis show that, assuming a debt capacity of HKD26bn under the base case, the AAHK is able to both remain profitable and retain an investment grade underlying rating under single parameter stress scenarios without requiring further financial support.

5.6.2

Debt Sizing

Conclusion

From our analysis, HSBC believes that a debt capacity of HKD26bn would be prudent for the AAHK and consistent with the Airport Authority Ordinance directive for the Airport to be run in a prudent and commercial manner. Given that the AAHK already has an average year-end debt balance of HKD9bn outstanding, the incremental debt available to the AAHK for 2-Runway Scenario is HKD17bn. After considering the additional interest cost of this debt of HKD4bn, c. HKD13bn of this capacity is available for funding the 2-Runway Scenario

5.6.3
Sources of
Debt

HSBC has examined a wide range of potential debt financing sources available to the AAHK for funding the 2-Runway Scenario. Our preliminary conclusion is that the debt market capacity is likely to be in excess of the HKD17bn required. Potential sources of debt include:

- USD long-dated bond market
- HKD long-dated bond market
- HKD loan market
- Other markets, including the Sukuk, GBP and EUR bond markets, as well as Export Credit Agency backed financings

The debt markets are described further in Chapter 6.9.1.3.

² HSBC indicative rating levels based on comparable credits

5.6.4 Funding Gap The AAHK has a cumulative pre-financing cash shortfall under the base case of HKD37.9bn of which only HKD13bn can be prudently financed with additional indebtedness. This leaves a funding gap of HKD25bn, which cannot be funded through the AAHK's internal cashflows and external prudent borrowings, and which will need to be met through other financing.

Chart 35 - 2-Runway Scenario Cumulative Cashflows

FY2014 – FY2031 Cumulative Cashflows	HKDbn (nominal)
Cash surplus from business (after dividends)	5
2-Runway Scenario CAPEX	(43)
Maximum Cumulative Pre-financing cash shortfall	(38)
Additional Debt	17
Net Interest Cost of Additional Debt (post-tax)	(4)
Funding Gap	(25)

Subject to views gauged on the way forward for the MP2030, further discussions between AAHK and the HKG on how best to bridge the funding gap would be necessary. In practice there are a number of different means by which this funding gap can be met. These include:

- Implementing "User Pay" charges to supplement the AAHK's existing revenues
- Seeking funding support from the HKG
- Issuing alternative financing instruments, such as hybrid capital, convertible bonds, subordinated bonds or preferred equity
- Seeking private sector equity financing

These options can be pursued independently or in combination. The optimal choice will depend on the priorities of the AAHK and its stakeholders, in addition to other factors such as credit rating considerations and capital market conditions. At this stage, HSBC has not been asked to consider these options for the purposes of this assessment.

6 3-Runway Scenario Analysis

6.1 Introduction

6.1.1 *Introduction*

The 3-Runway Scenario involves the construction of a third runway along associated passenger and cargo handling facilities on reclaimed land to the north of the existing airport site. The base case capital cost of the works required under this scenario up to FY2031 is HKD86.2bn in 2010 prices (HKD136.2bn in nominal prices, assuming construction cost indexation in line with forecasted TPI) and will serve to increase throughput at HKIA to c. 100 million passengers per annum.

As the 3-Runway Scenario represents a more substantial undertaking, featuring a number of significant risks, the AAHK has guided the scope of HSBC's assignment to primarily focus on this scenario

6.2 Review of Traffic Forecast

6.2.1
Overview of
HSBC
Approach to
Reviewing
Traffic Forecast

The traffic forecasts for 3-Runway Scenario provide a key cornerstone for the financial analysis of AAHK. These forecasts form the basis upon which the 3-Runway Scenario timeline has been constructed. Additionally, the traffic forecasts drive the AAHK's revenue. Passenger traffic govern terminal building charge, passenger security charge and retail revenues. Passenger and cargo traffic impact the number of air traffic movements, which is, in turn, determines landing and parking charge revenue.

The AAHK prepared an in-house traffic forecast and then appointed IATA, the Traffic Consultant, to validate and review the forecast estimates. In this section, HSBC provides a factual description of the IATA forecast methodology which forms the basis of the risk analysis presented in Chapter 6.7.2.

6.2.2 Summary of Material Reviewed HSBC has reviewed the report completed by the Traffic Consultant which details the traffic forecast methodology, assumptions, analysis and forecasting statistics that IATA have prepared for the Airport in its 2008-2030 primary traffic forecast.

Supplementary to these reports, HSBC also conducted a conference call with Mr. Laurent Delarue, Head of Airport Consulting for IATA, in order to discuss key questions identified through the review of the IATA report. Furthermore, a series of written questions were provided to and answered by IATA. HSBC also met the AAHK to discuss the AAHK's traffic forecast methodology.

6.2.3 Overview of IATA Forecasting Approach IATA's AAHK forecasting model relies on a dual approach combining topdown and bottom-up analysis. The top-down approach is made up of three major modules:

- 1) Regression analysis of historical traffic in order to construct a baseline passenger and cargo traffic projection
- Adjustment module which considers current and future changes in the airport environment which are not present in the historical analysis and thus not incorporated into the baseline forecasts
- 3) Movement forecast to derive the number of aircraft movements based upon the traffic forecasts

The bottom-up analysis checks the relevance of the traffic forecast in light of airline strategies.

Preliminary
Passenger Traffic
Forecast Based on
GDP

GDP Forecast for
Hong Kong and
World Markets

Preliminary Cargo
Traffic Forecast
Based on GDP

Reality Check with Industries

GDP Based Preliminary Forecast

Adjustments and Finalised

Adjustment Forecast
Based on GDP

Reality Check with Industries

Adjustments and Finalised

Movement
Sensitivity

Sensitivity

Sensitivity

Chart 36 - IATA Forecast Model

Source: AAHK

6.2.4 Regression Module A regression analysis is at the foundation of the IATA traffic forecasts. IATA has reported that its historical regression analysis indicated that the Airport's passenger traffic between 1993 and 2008 was strongly correlated with HKSAR GDP ("GDP"), measured in real terms. Additionally, IATA reported that other potential contributing factors, such as ticket price fluctuation, had not historically had a significant impact on the Airport's passenger traffic levels. The IATA analysis further demonstrated that for the 1993-2008 period, the elasticity between Airport traffic growth and Hong Kong GDP growth was close to 1x.

IATA has confirmed that this correlation between GDP growth and traffic growth is a global phenomenon which holds true for most airports in Europe, North America and Asia. Furthermore, IATA has reported that the elasticity is consistent with the Airport acting both as the sole airport in Hong Kong SAR and as an important airport for the fast growing PRD area. IATA has indicated that for developed markets such as Hong Kong, the elasticity is typically lower. However, for growing regions with low travel penetration the elasticity is higher. As such, the elasticity experienced by AAHK reflects the combination of developed and developing travel markets.

IATA has thus used this regression analysis as the basis for its baseline passenger traffic forecast.

For cargo traffic, IATA's methodology is substantially the same as for passenger traffic, with total cargo traffic demonstrating strong correlation to the HKSAR and world GDP (measured in real terms).

6.2.5 Adjustment Module The adjustment module incorporates the current and future changes expected in the competitive environment but not incorporated in the historical data. These items are not captured within the regression analysis and so adjustments need to be made to the baseline traffic forecasts.

Chart 37 - IATA Traffic Forecast Adjustment Factors

Passenger Traffic	Cargo Traffic
Direct Links	Direct Links
High Speed Train	Intensification of the competition on
	the Transshipment market
Hong Kong-Zhuhai-Macau Bridge	Hong Kong-Zhuhai-Macau Bridge
	Relocation of UPS and FedEx hubs
	to PRD from the Philippines

6.2.6 Movement Forecast Module The movement forecast module derives passenger and cargo aircraft movements from the passenger and cargo base case demand, based on an analysis of fleet plans, loading factors and payloads.

Aircraft movements are of primary importance because they drive the requirement for additional runway capacity. IATA estimates that passenger aircraft movements will increase at a rate of 3.0% for the period 2008-2030, slightly lower than the growth rate of 3.2% for passenger traffic

Cargo aircraft movements, a less significant element of overall traffic and revenue, are projected to increase at a rate of 4.0% compared with cargo volumes increasing 4.2%.

6.2.7 IATA Forecast Statistics Based on the methodology described above, air traffic demand forecasts for HKIA estimate that total traffic will reach 97 million passengers per annum and 8.9 million tonnes of cargo by 2030, given a respective CAGR of 3.2% and 4.2% between 2008 and 2030. Air traffic movements will reach 602,000 given a CAGR of 3.2%.

In addition to the base case, IATA also provided a set of High and Low Case traffic forecast numbers up to 2030, which are quoted below.

Chart 38 - Summary IATA Traffic Forecasts

	High Case	Base Case	Low Case
Passenger (million per annum)	104.7	97.0	89.4
Cargo (million tonnes per annum)	9.8	8.9	8.0
ATM (number per annum)	652,446	601,970	551,530

6.2.8 Traffic Conclusion After reviewing the IATA analysis, HSBC is of the view that the detailed traffic analysis is appropriate for consideration of a project of the nature envisaged by 3-Runway Scenario. However, as noted above, there are numerous risks associated with the traffic forecasts which HSBC recommends to be taken into account when assessing a prudent financing plan for the MP2030. These risks are discussed in detail in Chapter 6.7.2.

6.3 Review of Capacity Design

6.3.1 Overview of Design Capacity AECOM, the Master Plan Consultant, in conjunction with the AAHK, has produced a capacity design for 3-Runway Scenario. This design is primarily constructed to meet the traffic forecasts prepared by IATA. Other important considerations for the Master Plan Consultant include customer service levels, air traffic control requirements and optimisation of the design to handle the contaminated mud pits located to the north of the existing north runway.

In this section, HSBC provides a factual description of AECOM's recommendations.

6.3.2 Summary of the Material Reviewed For the purpose of the capacity design analysis, HSBC has reviewed the Airport Facilities reports prepared by AECOM Asia Company Ltd in association with Airbiz Aviation Strategies Pty Ltd. Additionally, HSBC has reviewed the preliminary design section of the Preliminary Engineering Feasibility and Environmental Assessment prepared by Mott MacDonald.

HSBC also met with AECOM on 21st December 2009 to discuss the technical aspects of the project and also sought written clarifications from AECOM on a number of key questions.

6.3.3
Current
Capacity and
Design
Throughput

The existing capacity of HKIA's two runways as at late 2009 was 58 movements per hour. The two-runway system can eventually accommodate up to 68 movements per hour by 2015 as per the advice of the Civil Aviation Department of the HKG, which represents 420,000 ATM per annum. This translates into a capacity of approximately 70m passengers and 5.6m tonnes of cargo.

The current designed terminal throughput of the Airport is approximately 50m passengers. The current Midfield development (which is outside the scope of the financial feasibility assessment) is expected to increase passenger handling capacity to approximately 60m passengers by FY2016. Cargo handling will also be increased to accommodate up to 4.3m tonnes per annum

6.3.4
Preliminary
Capacity
Design for 3Runway
Scenario

Based on the IATA base case traffic forecasts, the Airport will exceed its maximum capacity of the two-runway system in terms of aircraft movements and designed passenger throughput by FY2022. As a result, for the Airport to avoid becoming capacity constrained, and to take advantage of expected growth in demand, the Airport must increase both runway and terminal capacity by FY2022.

As such, AECOM has conducted a detailed study of the options available to AAHK to construct a third runway and the additional terminal facilities required. These reviews went through numerous options and several iterations to both determine the optimal layout for the Airport expansion and to fine tune the details of such expansion. It is intended that the level of service provided by the new facilities will be in line with the service level currently provided by the Airport.

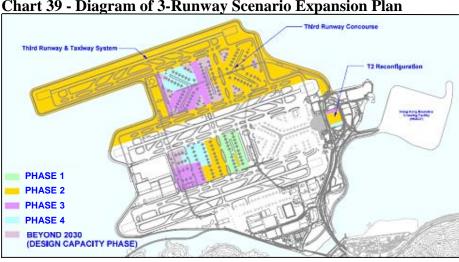


Chart 39 - Diagram of 3-Runway Scenario Expansion Plan

Based on current aviation regulations and the recommendation of AECOM and AAHK to implement a plan with a wide spaced third runway, the expected threerunway system will increase the runway capacity to a maximum of 102 movements per hour by FY2031. This translates into approximately 620,000 aircraft movements, c. 100m passengers and 8.9m tonnes of cargo per annum.

Similarly, AECOM has recommended an expansion of the passenger handling infrastructure comprising the construction of a second airside terminal concourse (T2C) and other associated requirements. The proposed design would also allow for further capacity increases beyond 100m passengers should technology (air traffic control) and regulations (air space management with Mainland) make possible more aircraft movements on the three runways. The proposed reclamation has additional land which could be used to house further passenger handling facilities if demand requires. Further expansion of capacity is however outside the scope of HSBC's assignment.

Chart 40 - 3-Runway Scenario Preliminary Capacity Design

	2010	Phase 1	Phase 2	Phase 3	Phase 4
Annual Passenger Capacity	c. 50 ¹⁹	c. 60	c. 85	c. 93	c. 100
Provision (m pax per annum)	C. 50	c. 00	C. 65	C. 93	C. 100
Total air bridge-served and					
remote ²⁰ aircraft parking	120	140	184	209	234
stands					

The above design plan proposed by the Master Plan Consultant achieves the targeted capacity increase in part through a plan to cross-utilise cargo and passenger stands and therefore does not include provision for contingency passenger stands. HSBC notes that HKIA currently operates with 10% contingency passenger stands.

6.3.5 Capacity Design

After reviewing the AECOM analysis, HSBC is of the view that the capacity design analysis is appropriate for consideration of a project the nature envisaged. However, HSBC notes that it is vital for the AAHK Board to be fully

²⁰ Remote aircraft parking stands can be used by both passenger and cargo aircraft

¹⁹ T1 and existing T2 combined - T2 reconfiguration and new T2C not yet under construction

Conclusion

comfortable that the level of services which will be provided by the proposed scope is consistent with the Board's expectations. Risks to the financial feasibility of 3-Runway Scenario attributable to the scope of works are discussed in Chapter 6.7.3

6.4 Review of CAPEX Estimates

6.4.1 Overview of CAPEX Estimates Mott, the Engineering Consultant, has been engaged by the AAHK to provide an Preliminary Engineering Feasibility and Environmental Assessment. The purpose of this assessment includes the provision of sufficient detail to enable the preparation of the project cost estimate, project implementation programme and project profile for the Airport Master Plan constructed by AECOM. Mott engaged DLS as Quantity Surveyor to assist in the creation of a project cost estimate. The ultimate project costs, as well as the spend profile, form a vital input into the financial feasibility analysis of the 3-Runway Scenario.

HSBC has reviewed the material produced by Mott and DLS. This section summarises the Mott and DLS reports. Chapter 6.7.4 revisits this material to present an analysis of potential risks to the project costing and to suggest appropriate sensitivities to be analysed.

6.4.2 Summary of the Material Reviewed HSBC has reviewed the CAPEX costs on the basis of preliminary design reports and cost estimates prepared by Mott and DLS as part of the Preliminary Engineering Feasibility and Environmental Assessment.

These report reviews were supplemented by meetings between HSBC, the AAHK, Mott and DLS.

6.4.3 Engineering Consultant Approach On the basis of the scope of work provided by AECOM and subsequent correspondence with AECOM and the AAHK, Mott have conducted an engineering feasibility study. The purpose of this study was to provide a sufficiently detailed engineering study to allow for the preparation of a project cost estimate.

The cost estimate has been conducted by DLS on the basis of the preliminary design created by Mott. This estimate is based upon estimates derived from a mix of:

- Current market prices
- Preliminary quotes from potential suppliers (land formation, APM and BHS)
- Comparable projects in Hong Kong (terminals, airfield facilities, land infrastructure) and elsewhere

Cost estimates are based on Q1 2009 price levels.

6.4.4 3-Runway Scenario CAPEX Estimate HSBC has reviewed the preliminary total CAPEX estimates compiled by Mott and DLS which cover the development of Airport beyond the current committed Phase 1 Midfield development. These cost estimates were completed based on a combination of comparisons with similar projects in Hong Kong and elsewhere, obtaining preliminary quotes from potential suppliers and benchmarking costs

of similar existing facilities at the Airport. Additionally, these cost estimates were also validated by Jacobs at the request of the Highways Department. The scope of work of Jacobs was to conduct an independent assessment on the reasonableness of the 3-Runway Scenario construction cost estimates from Mott's study on the basis of the preferred layout recommended by Master Plan Consultant. Jacobs' findings largely confirmed the original CAPEX estimates, and whilst minor amendments were suggested, the changes in key outputs were modest with differences not more than HKD4bn.

Jacobs' cost recommendations have been adopted by the AAHK and at the AAHK's request, HSBC has also adopted these estimates in its analysis. For the avoidance of doubt, HSBC has not reviewed the analysis undertaken by Jacobs and provides no opinion thereon.

HSBC notes that the CAPEX estimates include:

- An optional HKD2.0bn for land formation to be implemented during Phase 2 in order to benefit from synergies with the other main land formation works. However, the relevant land will only be used in later phases
- A further HKD4.5bn (including design/project costs and contingency) in 2010 prices of CAPEX to develop the Midfield in conjunction with the 3-Runway works. At the request of the AAHK, HSBC has included this figure in its analysis without further review
- Further refinements to the CAPEX estimates post Mott's and Jacobs' analysis which reflect changes to the proposed land formation techniques, largely in light of developments on the Hong Kong Boundary Crossing Facilities (HKBCF) for the HZMB project. HSBC notes that, where appropriate, the costing methodology applied is consistent with that applied by Mott and DLS. HSBC has reviewed these amendments, though as financial advisor, HSBC has largely relied upon the rationale and associated costs estimates as provided by the AAHK
- Design, site supervision and project management costs at HSBC's request, the AAHK (based on the work of Mott and Jacobs) have provided an estimate of 10% of the construction cost
- A 20% contingency given the early stage of the design process, as suggested by Jacobs
- Indexation Mott's and Jacobs' estimations were based on Q1 2009 prices and HSBC has therefore applied appropriate cost price indexation in this analysis. DLS advised that these costs are likely to increase roughly in line with Hong Kong TPI. Therefore, HSBC has used historic TPI levels to rebase the cost estimates in 2010 prices

In total, the CAPEX estimates stated in Q4 2010 prices assumed in the base case financial analysis are:

Chart 41 - Total 3-Runway Scenario CAPEX Estimates (2010 prices)

Stages (HKDbn, 2010 prices) ²¹	Phase 2	Phase 3	Phase 4	
Land Formation and Marine Works	27.7	2.2	0.0	
New Concourse	5.5	2.4	2.0	
Airfield Facility	3.3	1.3	1.1	
Terminal 2 Reconfiguration	4.4	1.2	1.0	
Baggage Handling System (BHS)	2.2	0.6	0.5	
Airport Support Facilities & Utilities	2.2	0.6	0.5	
Automated People Mover (APM)	2.2	0.6	0.5	
Apron Works	0.7	0.1	0.1	
Subtotal for Each Phase	48.2	9.1	5.6	
Subtotal for Phases 2-4	62.9			
Design/Project Management Cost (10%)	4.8	0.9	0.6	
Contingency (20%)	9.6	1.8	1.1	
Subtotal with Design / Management Cost and Contingency	62.6	11.8	7.3	
Total Construction Cost for Phases 2 – 4 with Contingency	<u>81.7</u>			
Additional Midfield CAPEX (inc. Design/Project Costs and Contingency	2.6	1.3	0.5	
Total Construction Cost 3- Runway	<u>86.2</u>			

The above figures are subject to rounding differences.

Of these cost estimates, the main cost item is the land formation works, which is necessary in order to reclaim the land required for the third runway and T2C. Comparable in size to the reclamation works for the initial airport development, this will be conducted in deeper waters and will require a more complex technology due to contaminated mud pits that have been deposited by other reclamation works in the HKSAR.

6.4.5 Construction Cost Indexation The CAPEX cost estimate above is based upon price levels as of Q4 2010. This is the typical method of calculating construction costs, but necessitates an adjustment be made to increase the CAPEX costs for changes in construction prices between the estimate date (Q4 2010) and the expected date of expenditure.

DLS have recommended that the most appropriate method of increasing CAPEX costs for construction price inflation is to utilize the Hong Kong TPI index. HSBC has applied a TPI growth forecast of 5% per annum from FY2011-FY2014, 5.5% per annum from FY2015 to FY2020 and 3% per annum thereafter. These forecasts are consistent with those applied by the HKG on other capital projects.

Applying this methodology and forecast, the nominal construction cost is

²¹ Excludes committed Phase 1 Midfield development

HKD136.2bn. However, HSBC notes that variation in the TPI rate can have a significant impact on this figure, which can in turn materially impact the financial feasibility of the 3-Runway Scenario. As such, HSBC has analysed the impact on the AAHK's financial profile should high construction cost indexation be experienced.

6.4.6
Timing of
Construction

At this stage of the design process, the AAHK has assumed that beyond the Phase 1 Midfield development, CAPEX will be divided into 3 phases, Phase 2 (FY2014-FY2022), Phase 3 (FY2023-FY2026) and Phase 4 (FY2028-FY2031). Within each phase, the AAHK has assumed that CAPEX is evenly distributed in real terms. HSBC has adopted these assumptions in its analysis under guidance from the AAHK. However, any subsequent update of the CAPEX phasing could have a material impact on the cashflow analysis and the resultant pre-financing cash shortfall and funding gap.

When adding the CAPEX for the associated Midfield development and replacement CAPEX for existing fixed assets, the overall capital expenditure in nominal prices is projected as follows:

HKIA Capex Breakdown HKD bn (nominal MP2030 128 128 Additional Midfield Works 8 8 3 9 Midfield (Phase 1) 7 25 Replacement 5 76 81 **HKD billions (nominal)** 219 Total 227 20 15 10 5 FY2015 FY2012 FY2018 FY2019 FY2028 FY 2020 FY 2022 FY2011 -Y2016 FY2021 ■ MP2030 ■ Midfield ☑ Midfield (Phase 1) □ Replacement

Chart 42 - 3-Runway Scenario Airport CAPEX Breakdown

The above figures are subject to rounding differences.

6.4.7 CAPEX Conclusion In summary, the Engineering Consultant and Quantitative Surveyor's work reviewed by HSBC has been consistent with our expectations for a project of this nature. However, as with the other consultants' reports, there remain numerous risks associated with the estimates. These are covered separately in Chapter 6.7.4.

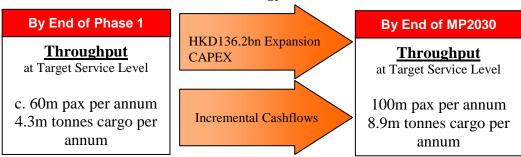
6.5 NPV and IRR Analysis

Using the same methodology as applied to the 2-Runway Scenario analysis and described in Chapter 5.3, HSBC has conducted a financial benefit and cost assessment of the 3-Runway scenario under the base case assumptions through

analysing the expansion project's NPV and IRR.

HSBC has based its analysis on incremental revenues generated and operating expenses incurred for air traffic beyond the forecasted capacity following the completion of the current HKD9.3bn (nominal prices) Phase 1 Midfield development in FY2016. The 3-Runway Scenario will consist of HKD136.2bn (nominal prices) in CAPEX. This will increase the throughput that the Airport can handle from c. 60m passengers at the target service level, 4.3m tonnes of cargo and 420,000 ATM per annum to c. 100m passengers, 8.9m tonnes of cargo and 620,000 ATM per annum following completion of the 3-Runway Scenario.

Chart 43 - IRR Calculation Methodology



The incremental cashflows through to FY2047 consist of additional revenues and costs derived from traffic volumes over the forecasted capacity following the Phase 1 Midfield development, as well as from those from the additional facilities opened under the 3-Runway Scenario. A terminal value of HKD104bn in FY2047 has been assumed in this calculation, based on a 15x EBITDA (net of replacement CAPEX) multiple. A diagram of the incremental cashflows generated by the 3-Runway Scenario is included below.

Chart 44 - Incremental Net Cashflows for the 3-Runway Scenario

Using a 10% discount rate, the 3-Runway scenario shows:

• A negative NPV of HKD43bn over the forecast horizon until FY2047 at a

10% discount rate

• The internal rate of return of 3%

The NPV of the 3-Runway Scenario at discount rates of 0% to 10% are shown in the table below.

Chart 45 - 3-Runway Scenario NPV at Different Discount Rate

Discount rate	NPV (HKDbn)
0%	116.1
1%	66.6
2%	31.6
3%	6.9
4%	-10.4
5%	-22.5
6%	-30.8
7%	-36.4
8%	-40.0
9%	-42.3
10%	-43.5

The 3-Runway Scenario standalone internal rate of return is relatively low, mainly due to the high CAPEX required coupled with the limited additional capacity gained.

The table below summarises the average asset cost per passenger per annum for the 3-Runway Scenario as compared with the rest of the Airport. As shown, the 3-Runway Scenario asset cost per passenger per annum is significantly higher than that of the existing facilities and the Midfield project.

Chart 46 - Comparison of Asset Cost per Passenger

Î	Asset Cost	Capacity (pax /Annum)	Asset / pax / Annum
Existing & Midfield	HKD 75bn	c. 60mn	HKD 1,300
3-Runway Scenario	HKD 86bn	c. 40mn	HKD 2,200

Source: AAHK annual reports, Midfield and MP2030 consultants' CAPEX estimate and capacity forecast

6.6 Base Case Cash Shortfall Analysis

6.6.1 Base Case Financial Projections Whilst the analysis above shows that the 3-Runway Scenario does not generate a commercial rate of return on a standalone basis, the Airport as a whole, including the implementation on the 3-Runway Scenario, remains profitable throughout the modelling period. Revenue, EBITDA and EBIT all grow throughout the projection period, with the exception of EBIT which suffers a drop after the opening of Phase 2 when the new assets begin to depreciate. A similar, but smaller, one time reduction is expected when Phase 3 and 4 begin operation in FY2027 and FY2032 respectively.

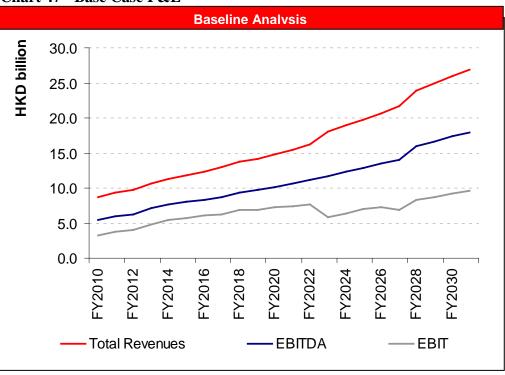


Chart 47 - Base Case P&L

6.6.2 Base Case Cash Shortfall Analysis

Using the methodology described in Chapter 5.4.2, HSBC has calculated the base case cash shortfall for the 3-Runway Scenario. Because the 3-Runway Scenario overlays an existing operational airport with a large scale, four phase expansion plan, the cashflow profile is somewhat unique. In broad terms, following the commencement of construction spending for Phase 2, the annual post-CAPEX cashflow of the AAHK becomes negative. This continues until the end of Phase 3 in FY2026. At this point, annual cashflow becomes positive as passenger volumes and airport charge revenues continue to rise, though the timing of replacement CAPEX can have a major influence on cashflows from year to year.

The charts below show both the cash shortfall on an annual and cumulative basis. The maximum cumulative cash shortfall can be considered as a measure of the external funding required, excluding any finance costs, to implement the 3-Runway Scenario.

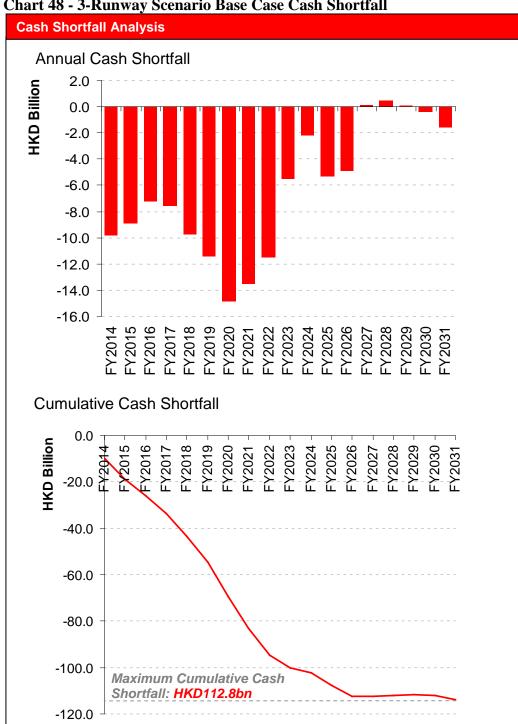


Chart 48 - 3-Runway Scenario Base Case Cash Shortfall

As can be seen from the above chart, in the base case, the maximum cumulative cash shortfall increases through to FY2026, with the vast majority of CAPEX spent in the early years of the project as part of the land formation process.

Chart 49 - Base Case Cumulative Cash Shortfall

FY2014 – FY2031	(HKDbn)
Operating Cashflows	185.4
Midfield Phase 1 CAPEX + Replacement CAPEX	(83.0)
Dividend	(78.9)
Net Cashflow after Dividend	23.4
3-Runway Scenario CAPEX	(136.2)
Cumulative Cash Funding Shortfall	(112.8)

The above analysis shows that AAHK will require HKD112.8bn of additional financing (excluding the cost of this financing on any incremental debt) in order to complete the 3-Runway Scenario.

6.7 Risk Identification

6.7.1 *Introduction*

The 3-Runway Scenario represents a highly complex project, the development of which has required the amalgamation of various assumptions and estimates. In this section, HSBC identifies and highlights some of the key risk areas associated with 3-Runway Scenario which have the potential to impact the financial position of the AAHK.

HSBC has also undertaken a sensitivity analysis to simulate the financial impact on the AAHK under a number of downside and upside scenarios. These scenarios seek to address the uncertainties surrounding key assumptions described in this chapter and Chapter 4.

The outputs from this analysis provide insight into the robustness of AAHK's business and financial profile under stressed cases and therefore the quantum of debt the AAHK can prudently bear. Additionally, this analysis is also representative of the approach potential debt providers will take when evaluating AAHK's credit.

6.7.2 Traffic Risk

The difficulties in accurately forecasting long-term traffic are widely acknowledged and recognised across a number of sectors, including airports.

In comparison to greenfield assets, the Airport's long operating history and relatively extended period of historic traffic data provides for a sounder basis from which to forecast long-term traffic. Nonetheless, HSBC is of the view that material risks still remain in the traffic forecasting process for the reasons described below.

6.7.2.1 Accuracy of GDP Growth Forecast

As described in Chapter 6.2.4, the forecast methodology applied by IATA is based on a strong correlation with GDP. The accuracy of IATA's forecasts for both passengers and cargo is directly linked and proportional to the accuracy of the GDP forecasts used in IATA's regression model.

In its forecasts for the Airport, IATA has primarily based its GDP assumptions on forecasts from Global Insights and the Economist Intelligence Unit (EIU). HSBC also notes that:

- Long-term GDP is very difficult to forecast accurately due to the large number of factors that can impact long-term GDP growth
- Economists' projections of long-term GDP can vary substantially, despite being made at the same time

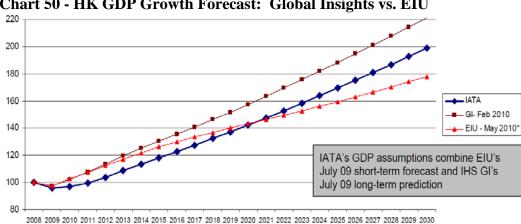
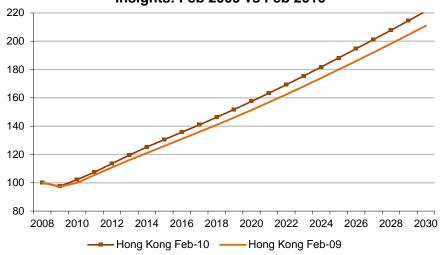


Chart 50 - HK GDP Growth Forecast: Global Insights vs. EIU

Source: IATA

Furthermore, HSBC notes that even forecasts from the same source are often subject to substantial revisions on a monthly / quarterly basis in response to changing economic conditions. As shown in the chart below, cumulative Hong Kong GDP growth forecast completed in February 2010 is almost 10% higher than the forecast completed in February 2009. Given the assumed elasticity of traffic against GDP growth in IATA's forecast methodology, this can be translated into c. 10% traffic increase by 2030. This scale of change is almost the same as the difference between the base and low case in the IATA traffic forecast for the HKIA.





Source: Global Insights

The IATA forecasts assume the historical elasticity between GDP growth and traffic hold over the forecast period.

IATA believes that this is consistent with their experience of airports in different economic environments. IATA view the Airport as exhibiting characteristics of both a mature market, as represented by the immediate Hong Kong catchment area, and a developing market, as represented by its wider GPRD catchment area. Whilst developing markets experience higher elasticity, mature markets tend to exhibit lower elasticity.

HSBC notes that if the catchment area of the Airport is effectively reduced through increasing competition and capacity at other GPRD airports, there is a risk that the elasticity associated with the Airport may be lower given the mature nature of the Hong Kong market.

6.7.2.3 Impact of Adjustment Factors Difficult to Verify As discussed in Chapter 6.2.5, in addition to the GDP-driven projection, IATA has made a number of adjustments to reflect current or future events that are not captured by the historical regression. IATA has derived these adjustment factors based on in-depth studies.

HSBC notes that the impact of such events can be difficult to quantify accurately and highlights some of the associated risks below. For the purpose of this analysis, HSBC has focused on adjustments relevant to passenger traffic as these have the most material impact on AAHK's financial profile.

6.7.2.3.1 Direct Links The establishment of direct flights between Mainland China and Taiwan constitutes a major change in the competitive environment in which the Airport operates. In 2008, approximately 17% of the Airport's passenger traffic was to or from Taiwan.

IATA projects that the impact of direct links will result in a lower market share of traffic between Mainland China and Taiwan. However, IATA believes that the impact is likely to be partially mitigated by the introduction of a new demand due to the relaxation of the cross-strait visa policy.

HSBC notes that IATA's methodology is based on a large number of complex interacting assumptions that are difficult to predict. For example, if flight capacity grows quicker than expected, the number of passengers transferring in Hong Kong will reduce and the number of direct flights to Taiwan from Guangzhou Airport ("CAN") and Shenzhen Airport ("SZX") will increase. In summary, HSBC believes that there may be downside risk to the Airport's traffic forecasts if competition develops more aggressively.

6.7.2.3.2 Express Rail IATA has estimated that the net impact of the Express Rail on the Airport's base case traffic forecast is negligible as a result of the following two counteracting factors:

• A loss of air passengers to the competing rail service. IATA's methodology for estimating the leakage of passengers to rail transport following the opening of the Express Rail Link is robust and based on studies from Europe and Japan. An extrapolation of the trends identified in these studies implies that for rail journeys of over 7.5 hours, there is a dissociation of the air and rail markets such that rail no longer competes with air, resulting in a negligible loss of market share to rail for journeys of this length. For shorter

journeys, IATA have applied a sliding scale based on journey time to determine the ultimate market share split depending upon train travel times

10% new air traffic induction ratio, based on European and Japanese cases (which ranges from 8% to over 100%)

HSBC notes that it is possible that a different market dynamic will develop in Mainland China than that which exists in developed markets such as Europe and Japan. For example, as Mainland China is still a developing market, consumers may be more sensitive to transportation prices than travel time (lower value of time). This may result in a higher diversion rate to lower cost rail travel than implied by current studies and a corresponding increase in the net loss of passenger traffic at HKIA.

There is also the plan currently under discussion for an expansion of the High Speed network to South East Asia. Given that in 2008 c. 23% of the Airport's traffic was to or from South East Asia, this expansion could present further downside risk to the traffic forecast, with routes such as those to Hanoi potentially facing significant competition.

6.7.2.3.3 Hong Kong Zhuhai Macau Bridge ("HZMB")

IATA has estimated that the net impact of the HZMB on the Airport's base case traffic forecast is negligible as a result of the following two counteracting

- A gain of passengers from Macao and Zhuhai markets
- A diversion of low-cost passengers from Hong Kong to Macao

In HSBC's view, IATA's analysis of the impact of HZMB on the Airport's traffic forecast is sound. However, HSBC notes the inherent difficulty in accurately quantifying the long term effect of such a large scale and transformational infrastructure project and recognises the potential downside risks associated with a greater leakage of passengers to Macau airport as a result of the new bridge.

6.7.2.3.4 Greater Competition from Other GPRD Airports

IATA has forecasted a declining market share of the total GRPD traffic for the Airport as a result of greater competition for other GPRD airports.

Despite this decreasing market share, IATA has assumed that passengers will continue to travel from the PRD in large (and growing) numbers to fly out of Hong Kong. HSBC notes that there are a number of factors which could present downside risks to this assumption, such as:

- CAN's status as one of the three designated International Hubs in China, with strong policy support to grow its international traffic. If CAN is successful in more aggressively growing its international traffic, fewer PRD residents will be expected to travel to Hong Kong to make international journeys
- Faster than expected development of GPRD airports in terms of increasing capacity and flight availabilities, allowing these airports to capture a larger market share than is currently forecasted
- Higher than expected leakage of HKSAR related passengers to SZX

6.7.3 The 3-Runway expansion plan is a large, complex engineering project, and as Preliminary Capacity Design Risk such, faces sizeable challenges which include being able to accurately scope the design requirements at the preliminary design stage. HSBC notes that during the course of its assignment, the scope and associated cost of the proposed 3-Runway Scenario has changed significantly as the design process has evolved and been further refined. For example, the area of reclamation, the reclamation method for certain parts of the reclamation and the number of stands have all been modified. The targeted capacity has been achieved in part through a plan to cross-utilise cargo and passenger stands and therefore does not include provision for contingency passenger stands. HKIA currently operates with 10% contingency passenger stands.

Given that the preliminary capacity design is a key driver of both project costs and the quality of service deliverable at the Airport, HSBC recommends that the AAHK Board be fully comfortable with the design. As the project progresses there is a high probability of design changes arising from further optimisation work and/or requirements imposed by the review and approval process. Furthermore it is typical that as the project moves from preliminary design to more detailed design that a higher degree of confidence around cost outcomes will be achieved.

6.7.4
CAPEX Cost
Estimation Risk

In addition to capacity design risk, there are other risk areas associated with the estimation of the costs of extensive works required. The work done to date by AECOM, Mott and DLS has attempted to limit these risks by conducting thorough and professional planning. However, the consultants and HSBC have identified a number of key risks which still remain.

6.7.4.1 Land Formation HSBC notes that there are material risks surrounding the land formation works, especially in relation to the application of new, relatively untested techniques. Whilst Hong Kong has extensive experience in land formation, for example from the original development of the Chek Lap Kok site, changes in environmental policy have meant that the historical methods applied are no longer permitted. In particular, modern environmental policy does not allow for the large scale removal of marine mud, a technique used extensively on past projects to provide sound foundations. Consequently, alternative methods have been required to be developed to implement the 3-Runway Scenario.

6.7.4.1.1 Untested Land Formation Techniques The land formation techniques proposed for 3-Runway Scenario includes extensive deployment of Deep Cement Mixing ("DCM").

HSBC understands from the consultants that, from an engineering perspective, DCM is not technically complex and is becoming more widely adopted as a result of new environmental regulations. However, it has not been applied before in Hong Kong or on the scale proposed for the 3-Runway Scenario. As such, its application carries additional technical risks, given higher uncertainty surrounding the process and lesser experience of the operators.

6.7.4.1.2 Scale of DCM Equipment Requirement HSBC also notes the potential for higher than expected cost escalations of the DCM works arising from the scale of the DCM operation proposed for the 3-Runway Scenario. The DCM requirement for the 3-Runway Scenario is substantial compared with the historic amount of DCM conducted globally to date, and therefore will require a significant portion of the entire DCM

equipment available globally. HSBC has been informed that whilst it is possible to adjust other forms of equipment to perform DCM work, it is unclear if such equipment would be as efficient or cost effective as dedicated machinery. Therefore, should there be a shortage of suitable equipment, it is possible that cost escalations could result.

6.7.4.1.3 Contaminated Mud Pits HSBC understands that the proposed DCM works are complicated by the presence of large contaminated mud pits in the reclamation area, which could impact the cost and schedule of these works.

These mud pits were originally dug to provide landfill for the initial Airport construction and were subsequently filled with contaminated mud from other projects in Hong Kong. As such, the nature of the mud in these pits is less solid than undisturbed marine mud and consequently requires DCM techniques to provide a sound foundation. However, the precise condition of the mud remains unknown and may vary significantly in different parts of the pits. Where the mud conditions prove to be less solid than expected, larger amounts of cement may be required, leading to higher costs. Mott estimates that in a worst case scenario where the condition of the mud proved to be sufficiently poor to require the entirety of the pits to be filled with cement, DCM costs would increase significantly. However, Mott believes that such a scenario would be unlikely.

HSBC notes that to reduce the uncertainty associated with DCM costs, the AAHK is planning to conduct DCM trials to provide more information about the condition of the marine mud and the amount of cement that will be required to stabilise the ground conditions.

6.7.4.2 EIA Risks HSBC notes that there is a degree of uncertainty regarding the EIA approval process and its outcome which may impact the timing and costs associated with the 3-Runway Scenario. Potential risks identified include:

- The EIA approval process could take longer than expected
- The EIA imposing construction restrictions, for example prohibiting 24 hour 365 day a year construction as currently proposed, due to the potential impact on marine life

In the event that various restrictions are imposed by the EIA, it is possible that the construction program may be delayed, potentially leaving the Airport unable to accommodate the projected increase in air traffic. Additionally, the restrictions may result in increased capital expenditure for land formation works.

6.7.4.3 Land Settlement HSBC understands that the duration of the land settlement process is very difficult to predict and there is the potential for this to take longer than expected. Based on Mott's estimation, the maximum likely delay would be 6-12 months, with a maximum cost increase of up to HKD200m.

6.7.4.4 Landfill

HSBC notes the large scale of the project and understands that the procurement of landfill required for the 3-Runway Scenario is dependent on Hong Kong-China governmental negotiations. HSBC notes the risk that these negotiations

may take longer than expected or that the resultant price for materials may be higher than forecasted.

6.7.4.5 Reliance on Quotes "bidder bias" HSBC notes that certain elements of the cost estimate provided by DLS may be exposed to the risk of "bidder bias" which may result in an underestimation of procurement costs. In compiling its cost estimates, DLS has obtained indicative quotes from potential suppliers. In HSBC's experience, suppliers are typically strongly incentivised to see a project proceed, and consequently may deliberately underestimate the true cost in their quotes. Furthermore, as the suppliers are not bound to their indicative quotes, there is no disincentive to them from taking this approach. For some projects, planners take steps to mitigate the potential for bidder bias. However, for the cost estimates received for the 3-Runway Scenario work, HSBC understands that DLS has not employed such countermeasures. In particular, HSBC highlights the potential risk associated with the DCM cost estimates which are largely based on a single quote from Penta Ocean. HSBC notes that DLS has attempted to partially mitigate this risk by benchmarking this cost estimate against recent projects in Hong Kong and elsewhere, but acknowledge that there are no precedents for a programme on this scale. Given the scale of the DCM works, any potential cost underestimation on this element could have a substantial impact on the overall project costs.

Given the complexity of the cost estimation process, it is advisable for the AAHK to consider an independent engineering advisor to review project cost estimates and validate the assumptions and methodology.

6.7.4.6 Interface Risk HSBC understands that AAHK plans to retain the interface risk with individual contractors. In HSBC's experience, this risk is significant for a project as large and complex as the 3-Runway Scenario. Whilst it is difficult to quantify this risk, HSBC notes that the incremental cost of securing fixed price turnkey type contracts for the delivery of large scale construction projects can in the order of c.20% of the construction sum, reflecting the private sector's view of the substantial risk involved.

6.7.4.7 Baggage Handling Risk

HSBC understands that as part of the 3-Runway Scenario proposals, a new baggage handling system will be installed. Such systems represent a critical piece of airport infrastructure. As baggage handling systems are logistically complex pieces of equipment, the technical risks associated with their installation are material. There are numerous examples of airports, including HKIA, which have experienced problems with baggage handling systems, which have subsequently led to smajor disruptions of the airport's operation.

HSBC understands that the AAHK has deliberately chosen a low risk option for the proposed baggage handling system for the refurbished T2 and T2C. This system is based on the same technology as currently employed at the Airport and does not use the more advanced, but relatively unproven, Destination Coded Vehicle technology.

However, given the historical experience of baggage handling system experience at other airports, HSBC is of the view that there remains some risk of difficulties with the baggage handling system either delaying the opening of

T2C and/ or requiring extra funds to fix a non-functional system.

6.7.5 Construction Cost Indexation As described in Chapter 5.5.4, construction cost indexation represents a key area of uncertainty which could have a substantial impact on the nominal CAPEX costs.

6.8 Stress Tests

The sections above have summarised the key risks and uncertainties surrounding the assumptions underlying the 3-Runway Scenario base case financial projections.

In order to evaluate the potential impact of these uncertainties on the funding requirement for the 3-Runway Scenario, HSBC has conducted a sensitivity analysis which stresses key risk areas. HSBC has run stress tests on each single parameter and analysed the impact of the various sensitivities on the cumulative funding shortfall. The parameters and the results of each stress case are summarised in the table below.

Chart 52 - Summary of Stress Case Parameters and Outputs

Chartsz	Jummar y	of Stress Case 1 arameters and Outputs						
E)/0044		SINGLE PARAMETER STRESSES						
FY2014	Base case		High CA	PEX case	Low traffic	No Airport		
- FY2031		High TPI	+10% overrun	+20% overrun	case	Charge Increase		
Traffic Forecast	IATA Base Case	IATA Base Case	IATA Base Case	IATA Base Case	IATA Low Case	IATA Base Case		
CAPEX Estimate (2010 prices)	86bn	86bn	93bn	100bn	86bn	86bn		
CAPEX Estimate (Nominal prices)	136bn	150bn	147bn	157bn	136bn	136bn		
Cost Indexation	3.0 - 5.5%	4.0 - 6.5%	3.0 - 5.5%	3.0 - 5.5%	3.0 - 5.5%	3.0 - 5.5%		
Airport Charge Increases	With CPI	With CPI	With CPI	With CPI	With CPI	None		
Cumulative pre-financing cash shortfall (HKD)	113bn	133bn	122bn	131bn	117bn	122bn		
Year of peak pre-financing cash shortfall	FY2031	FY2031	FY2031	FY2031	FY2031	FY2031		

Although not a primary focus of the sensitivity analysis, HSBC has also created a number of high case scenarios. These were incorporated into the analysis in order to provide guidance as to the potential scope for reductions in the funding shortfall of the 3-Runway Scenario from various measures.

Chart 53 - Summary of High Case Parameters and Outputs

FY2014 - FY2031	Base Case	Pax construction surcharge	20% airport charge increase	High traffic	10% capex reduction
Traffic Forecast	IATA Base Case	IATA Base Case	IATA Base Case	IATA High Case	IATA Base Case
Airport Charge Increases	With CPI With CPI With		With CPI	With CPI	
Pax construction surcharge (starting FY2014)	Nil	HKD15 - HKD30	Nil	Nil Nil	
CAPEX Estimate (2010 prices)	86bn	86bn	86bn 86bn		80bn
Cost Indexation	3.0 - 5.5%	3.0 - 5.5%	3.0 - 5.5%	3.0 - 5.5%	3.0 - 5.5%
Cumulative cash shortfall (HKD)	113bn	109-111bn	110bn	110bn	104bn
Year of peak funding shortfall	FY2031	FY2031	FY2026	FY2031	FY2031

A visual representation of the above charts are captured in the tornado diagram below:

Chart 54 - Illustration of Stress Test Outputs



Whilst traffic assumptions and assumptions regarding airport charges have a substantial effect on the long term cashflows of the project, their impact on the maximum cumulative cash shortfall is modest. This is due to the fact the maximum cash funding shortfall is driven by the project cashflows up to FY2026, and over this relatively short time horizon, traffic numbers and airport charges have not deviated significantly from the base case.

By contrast, the impact from CAPEX and cost indexation changes is far more significant. As can be seen from the bottom two elements of the tornado diagram the potential CAPEX related cost overruns have the ability to dramatically increase the cash shortfall amount. This is unsurprising considering the significant cost of the CAPEX proposed under the 3-Runway Scenario.

The tornado diagram also indicates a bias towards larger cash shortfalls resulting from the low case sensitivities as compared with smaller shortfalls

resulting from the high case sensitivities. This implies that the base case assumptions are more susceptible to downside risks as opposed to upside. HSBC believes that this is reasonable. For example, experience in international markets shows that projects have both a far higher propensity and greater ability to overrun significantly than to come in significantly under budget.

The stress test analyses show that a number of factors could materially impact the cash shortfall and thus the funding requirement of the 3-Runway Scenario. Given such uncertainty, HSBC believes that it is imperative that the AAHK maintain a prudent financial profile and finance the base case in a conservative manner.

6.9 Financing Analysis

6.9.1

Debt Financing

Considerations

In Chapter 6.5, HSBC discussed how, under base case assumptions, the 3-Runway Scenario does not generate a commercial rate of return a standalone basis. This is because the project achieves only a base case IRR of around 3% and a NPV of negative HKD43bn, applying a 10% discount factor.

After taking into consideration the impact of the 3-Runway Scenario CAPEX on the overall financial position of the AAHK, HSBC has calculated in Chapter 6.6.2 that the cash shortfall for the AAHK is HKD112.8bn if the 3-Runway Scenario is implemented.

In Section 6.7, HSBC presented a number of risks which could cause the funding shortfall to widen. These would also cause the IRR and NPV to deteriorate.

In order to evaluate whether the AAHK has the financial ability to undertake the 3-Runway Scenario without additional HKG support HSBC has sought to develop a funding plan for 3-Runway Scenario which is consistent with the principle of commercial prudence set out in the Airport Authority Ordinance.

As the first stage of this analysis, HSBC has explored the amount of further indebtedness the AAHK can incur if it proceeds with the 3-Runway Scenario whilst still remaining consistent with the prudent commercial principles of the Airport Authority Ordinance.

6.9.1.1 Debt Sizing Methodology As described in Chapter 5.6, in order to guide the assessment of the appropriate and prudent level of debt funding for the AAHK, HSBC in conjunction with the AAHK have established a number of high-level principles.

Within the context of these principles, HSBC recognises that there are a number of methods which can be applied to size the prudent debt level for the AAHK and that different financing parties, including banks, bondholders and rating agencies, will approach the credit analysis of the AAHK in different ways. However, all parties will recognise the material risks associated with the 3-Runway Scenario and therefore it will be vital for any funding strategy to have sufficient buffer to accommodate these risks.

HSBC has applied three different methodologies in its analysis of the

appropriate maximum debt level for the AAHK:

- 1. Maintain appropriate Debt/EBITDA ratio
- 2. Capacity to service and amortise debt
- 3. Ability to withstand downside stress cases

6.9.1.1.1 Debt/ EBITDA Ratio In this analysis, HSBC has considered the Debt/EBITDA ratio, this being a key indicator closely monitored by not only the rating agencies, but also lenders. As with the 2-Runway Scenario, HSBC has applied S&P's rating metrics as shown earlier and re-created below²²:

Chart 55 - S&P's Debt/EBITDA Matrix

Debt / EBITDA		<1.5x	1.5-2x	2-3x	3-4x	4-5x	>5x
Financial Profile		Minimal	Modest	Inter- mediate	Significant	Aggressive	Highly Leveraged
	Excellent	AAA	AA	A	A-	BBB	
Profile	Strong	AA	A	A-	BBB	BB	BB-
	Satisfactory	A-	BBB+	BBB	BB+	BB-	B+
Business	Fair	-	BBB-	BB+	BB	BB-	В
usi	Weak	-	-	BB	BB-	B+	B-
B	Vulnerable	-	-	-	B+	В	CCC+

Source: S&P 2008 Corporate Criteria: Analytical Methodology

The 3-Runway Scenario is a capital intensive, highly complex and long-term project which almost doubles the Airport's existing capacity. As such, it exposes AAHK to significant business risks. Therefore, HSBC believes that AAHK's business profile is likely to weaken from the "Excellent" to the "Strong" category if it proceeds with the proposed 3-Runway Scenario.

As described in Chapter 5.6, HSBC believes that maintaining an underlying rating of a solid single 'A' would allow the AAHK to comfortably retain its AAA senior, unsecured debt rating, as well as the cost at which it is able to access the debt capital markets. Given the business risk categorisation of "Strong" as described above, should the AAHK wish to maintain a solid single "A" underlying rating, this would imply a maximum Debt / EBITDA ratio of no more than 2.0x, derived from the midpoint between the Modest and Intermediate financial profiles.

The majority of the AAHK's funding requirement is needed in the period up to the end of Phase 3 in FY2026 in which most of the proposed CAPEX is spent. Beyond this point, the AAHK's internal cashflows are largely sufficient to finance the required dividends and CAPEX. Therefore, HSBC has considered the debt raising capacity of the AAHK up to FY2026 only. Under base case assumptions, the EBITDA at this point is HKD13.5bn. Based on the analysis above, this implies a total recommended debt capacity for the AAHK of c. HKD27bn.

-

²² HSBC has focused on S&P's rating analysis as S&P currently rate the AAHK. However, HSBC's preliminary analysis shows that the application of the Moody's 2008 rating methodology "Operational Airports outside of the United States", would give a result consistent with that derived under the S&P approach described

6.9.1.1.2 Capacity to Service and Amortise Debt Approach The 3-Runway Scenario exhibits a cashflow profile typical of infrastructure projects, with a long construction period including significant cash outflows which need to be financed, followed by a period of positive cashflow generation from which borrowings can be serviced and repaid. In financing such projects at the outset lenders would typically look at metrics for sizing debt such that it can be serviced and fully amortised within a reasonable period.

The key parameters governing this type of approach are the repayment period and the required Debt Service Coverage Ratio ("DSCR"). For the purposes of this analysis we have considered a debt profile which is fully repaid within 10 years following the completion of Phase 2 in FY2022 (which represents the majority of both the 3-Runway Scenario construction works and CAPEX spend). A DSCR of 2.0x has been adopted, which HSBC believes is appropriate for a project of this nature.

In this analysis, HSBC has assumed that subsequent phases of the 3-Runway Scenario are not carried out. The rationale for this is that within the loan documentation, lenders would require that the incurring of such expenditures would be subject to (1) meeting specific tests including demonstration of viability and preservation of debt servicing capacity or (2) the debt being fully repaid.

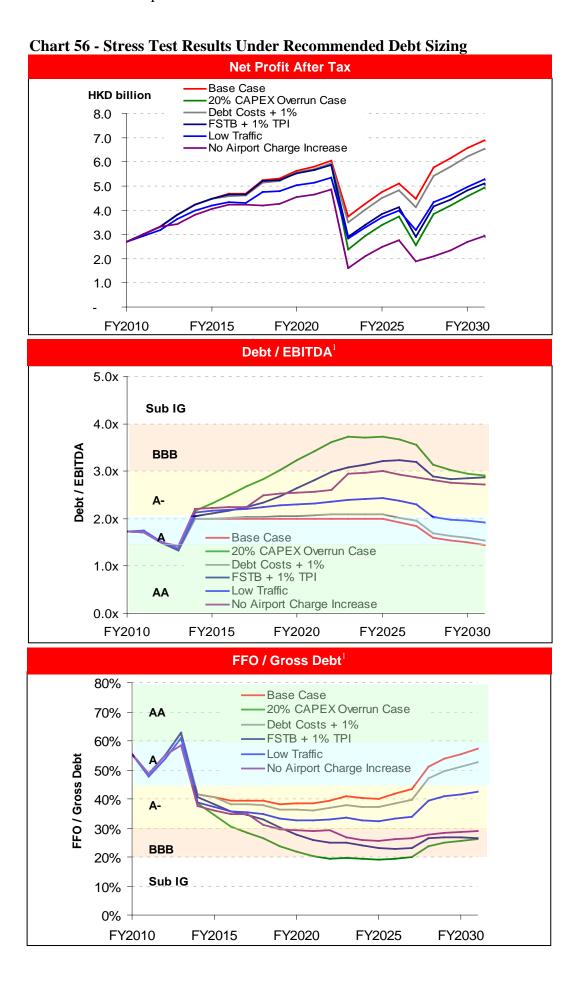
Based on the assumptions listed above, the AAHK's cash flow can support a total debt amount of HKD26bn. This amount is consistent with the conclusion drawn from the Debt / EBITDA multiple analysis.

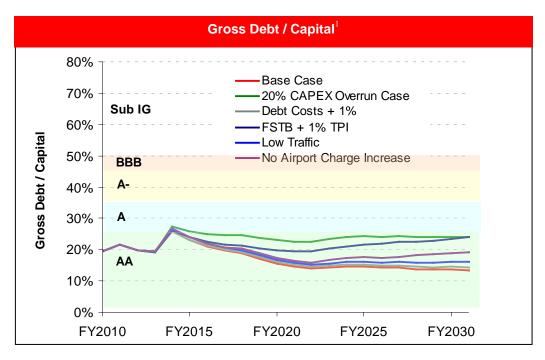
6.9.1.1.3 Withstand Downside Stress In addition to the two sizing methods mentioned in the previous paragraphs above, a third method of sizing a prudent and reasonable base case debt amount is to determine the maximum debt level that would still allow the AAHK to withstand specific downside scenarios.

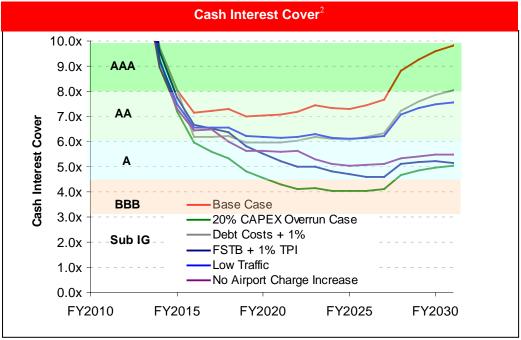
In this analysis HSBC has assumed that in downside scenarios, the AAHK will seek to fund the escalating financing shortfall through borrowing. For such funding to be available at reasonable cost, the AAHK must retain a financial profile conducive to debt capital raising. HSBC has defined this profile as:

- Remaining profitable
- Being consistent with a standalone investment grade rating (i.e. BBB- or higher). As described in Chapter 5.6, the retention of an underlying investment grade rating is a critical element in the rating agencies assessment of the likelihood of HKG support, as well as investor perception of the credit, with a fall to beneath investment grade potentially impacting the ability of the AAHK to access the debt capital markets at an acceptable cost.

In terms of the latter, HSBC has assessed this with reference to S&P's Debt/EBITDA requirement for an investment grade rating. Assuming a debt level of HKD26bn under the base case, it can be seen below that the AAHK is able to meet the above conditions under single parameter stress scenarios.







¹ Illustrative rating levels defined according to S&P's 2008 Corporate Criteria: Analytical Methodology, assuming a "Strong" financial profile

These charts show that by the financial metrics analysed by the rating agencies, a prudent debt capacity of HKD26bn under base case assumptions will allow the AAHK to retain a standalone investment grade rating on the occurrence of various single-parameter downside stresses. On key leverage ratios, such as Debt/EBITDA and FFO / Gross Debt, the analysis also indicates that under these scenarios the debt levels would rise to the border of investment grade. As such, any more debt in the base case would result in serious financial stress for the AAHK under the downside scenarios, which could jeopardise the ability of the AAHK to access the debt markets at acceptable levels.

² HSBC indicative rating levels based on comparable credits

6.9.1.2 Debt Sizing Conclusion As a result of these three independent lines of analysis, HSBC has recommended a prudent debt sizing of HKD26bn for the base case. This represents the lower of the debt sizing results produced by these three approaches. Given that the AAHK already has an average year-end debt balance of HKD9bn, the incremental debt available to the AAHK for 3-Runway Scenario would be HKD17bn.

6.9.1.3

Debt Financing

Market Options

HSBC has examined a wide range of potential debt financing sources available to the AAHK for funding the 3-Runway Scenario. Our preliminary conclusion is that the debt market capacity is likely to be in excess of the HKD17bn of incremental debt that the AAHK might prudently borrow. In the following section HSBC outlines the key characteristics of the various debt markets available to the AAHK.

6.9.1.3.1 USD Bond Market HSBC is of the view that the AAHK could raise substantial quantums of financing in the USD bond market.

As the construction programme for the 3-Runway Scenario spans 18 years, ideally, the debt tenor for the project should be greater than 18 years. In the US market, the greatest liquidity for bonds over 18 years is at the 30 year maturity. However, few HK corporates have issued bonds of this maturity in this market, with one downside being the difficulty in hedging the resultant USD exposure. This is because HKD/USD cross-currency swap liquidity at longer maturities is extremely limited, restricting the amount that can be swapped at the longer end of the curve. Should sufficient liquidity in the swap market not be available at this tenor, 10 year USD bonds could be issued instead of 30 year bonds. While the tenor of these bonds would not extend beyond the end of construction period for Phases 2-4 of the 3-Runway Scenario, it would extend beyond the end of the Phase 2 construction which covers the vast majority of the CAPEX.

6.9.1.3.2 HKD Loan Market The HKD loan market consists of both the corporate loan market and the project finance loan market. The former is typically relationship bank driven and pricing tends to be tighter as banks will expect ancillary revenue sources to subsidise such loans. Project finance lenders typically place more focus on the credit analysis of the project when determining pricing, tenor and appetite.

Given the significant risks introduced by the 3-Runway Scenario project to the AAHK credit, HSBC believes that terms that AAHK can achieve in the HKD loan market may be closer to that of project finance loans.

There have been few large HKD project finance loans completed in the last few years. The Ocean Park financing in 2006 is the most recent project finance style loan executed in the Hong Kong market.

6.9.1.3.3 HKD Long-dated Bond Given the match in tenor and currency, the HKD long-dated bond market is a natural choice for raising funding for the 3-Runway Scenario. This market can potentially offer tighter pricing than the USD bond market, though market capacity is still relatively limited. It should be noted that whilst currently the coupons on these HKD bonds are at historic lows, lower than comparable USD bonds, this does not reflect the long term rates in this market.

6.9.1.3.4 Other Markets

In addition to the abovementioned options, there are some other potential debt financing alternatives for the AAHK to consider.

Islamic financing through the Sukuk market can potentially offer attractive terms and achieve meaningful size although the tenor achievable in this market is typically limited to five years.

As international contractors are likely to have a significant participation in the 3-Runway Scenario construction, Export Credit Agency supported finance may also be available. This can be either in the form of a guarantee to facilitate commercial bank funding or direct lending.

The GBP market has an established investor base for long-dated assets and can potentially achieve a good size. Additionally, the EUR market as well can be an alternative source of liquidity. Alternatively Asian local currency issuance (for example, in Singapore dollars) could also provide attractive pricing. Currency risks however, would need to be properly hedged under these funding routes.

6.9.2 Funding Gap

The AAHK has a cumulative pre-financing cash shortfall under the base case of HKD112.8bn. As discussed in Chapter 6.9.1.2, the incremental debt that the AAHK can prudently borrow is c. HKD17bn. Allowing for interest costs on this debt, HKD11bn is available to meet this cash shortfall. This leaves a funding gap of HKD102bn which will need to be financed through some other means.

Chart 57 - 3-Runway Scenario Cumulative Cashflows

FY2014 – FY2026 Cumulative Cashflows	HKDbn (nominal)
Cash surplus from existing business (after dividends)	23
3-Runway Scenario CAPEX	(136)
Maximum Cumulative Pre-financing cash	(113)
shortfall	
Additional Debt	17
Net Interest Cost of Additional Debt (post-tax)	(6)
Funding Gap	(102)

As guided by the AAHK, the preliminary funding analysis above assumes that debt capacity is utilised first, and that:

- The AAHK rolls over the existing HKD9bn debt
- The AAHK raises incremental debt amount up to a debt level of 2.0x EBIDTA over the period up to FY2026, when the maximum total debt level of HKD26bn is reached
- The HKG injects equity as required to make up any funding gap after the AAHK's debt capacity has been utilised

Whilst the analysis assumes that the funding gap is made up through simple common equity injections, in practice there are a number of different formats this gap can be financed. The options listed below are not mutually exclusive. They can be pursued independently or in combination. The optimal choice will depend on the priorities of AAHK and its stakeholders, in addition to other

factors such as credit rating considerations and capital market conditions at the time when the additional funding is needed.

• "User-Pay" charges

The implementation of "User-Pay" charges, such as a passenger construction surcharge will contribute towards the financing of construction costs for the MP2030. HSBC notes that there is precedent of other airports globally having implemented similar "user-pay" techniques to fund large CAPEX programmes.

• Reduction in dividends

The current base case assumes that the AAHK will continue to pay 80% of its net income to the HKG in the form of dividends, in line with historical precedent. Should this dividend level be reduced, then pre-financing cash shortfall and the funding gap would also be reduced.

• Alternative financing instruments

Besides senior debt and common equity, there are other financing instruments along the debt/equity spectrum, which the AAHK could exploit, such as retail bonds, subordinated debt, hybrid capital, perpetual debt and preferred equity. These options would need to be considered in the context of financing cost, investor demand and equity dilution as well potential benefits for the AAHK in respect of credit rating, accounting and tax considerations.

• Equity funding from the private sector

Private sector equity capital can be accessed through a partial privatisation of the AAHK, or a partial sale of interest in the HKIA to a selected group of investors. However, such an approach may give rise to a number of considerations, including investor return requirements, political sensitivities surrounding the dilution of the HKG's interest in the AAHK, and the implications for the control of the AAHK, particularly in relation to strategic, operational and pricing issues.

Subject to views gauged on the way forward for the MP2030, further discussions between the AAHK and the Government on how best to bridge the funding gap would be necessary. At this stage, for the purposes of this assessment, HSBC has not been asked to consider these options, which will instead be analysed in detail at a later stage.

HSBC notes that a significant amount of additional work to refine the estimate of the capital costs is required before a final financing plan can be determined. These include additional planning in relation to CAPEX, DCM trials and the EIA process. These processes are likely to result in amendments to the 3-Runway Scenario which will require the financing plan to be updated accordingly.

Additionally, HSBC note that if the HKG decides to proceed with 3-Runway Scenario, they will have significant flexibility in terms of the method of financial support they provide. The ultimate decision on how to structure this support will depend on HKG priorities at the time such a decision is made.

7 Conclusions

Both the 2-Runway Scenario and 3-Runway Scenario involve significant investment in HKIA in order to allow the Airport to meet forecasted growth (or partially meet in the case of the 2-Runway Scenario) in air traffic whilst still maintaining its target service standards. Given the significant CAPEX required, HSBC's analysis has shown that, under base case assumptions, both the 2-Runway Scenario and 3-Runway Scenario are not commercially viable on a purely financial basis with both scenarios demonstrating low IRRs and negative NPVs. While the projects may provide benefits to the wider Hong Kong economy, quantifying this benefit does not fall under the scope of HSBC's assignment.

The 2-Runway Scenario contemplates an expansion project within the existing Airport footprint, delivering a smaller increase in throughput at a lower cost. The cost of implementing the 2-Runway Scenario exceeds the Airport's net cashflows during the construction period by HKD37.9bn under base case assumptions. Only HKD13bn if this shortfall can be funded by debt prudently raised by the AAHK. Post debt financing, a funding gap of HKD25bn still remains.

The 3-Runway Scenario represents a larger expansion project, involving the reclamation of additional land. Relative to the 2-Runway Scenario, this scenario is more costly, but almost doubles HKIA's passenger and cargo handling throughput. The significant financial cost of implementing the 3-Runway Scenario exceeds the Airport's net cashflows during the construction period, resulting in a substantial pre-financing cash shortfall of HKD112.8bn in the base case. Based on a prudent sizing of the AAHK's debt capacity, the AAHK can only finance HKD11bn of this through prudent borrowing, leaving a funding gap of HKD102bn.

This funding gap shows that neither the 2-Runway nor 3-Runway Scenarios can be funded through by AAHK's internal cashflow and external prudent borrowing capacity alone. This funding gap can be met through a number of sources, either individually or in combination, including further equity injections from the HKG, reduced dividends to the HKG, additional revenues from the implementation "user-pay" charges, alternative financing instruments and/or private sector equity financing. The optimal choice of these will depend on the priorities of the AAHK and its stakeholders, in addition to other factors such as credit rating considerations and capital market conditions.

HSBC notes that there remain uncertainties surrounding a number of the key assumptions, which can result in a material increase in the pre-financing cash shortfall over that shown under the base case. Whilst HSBC has developed a prudent financial profile which allows the AAHK to withstand some stressed conditions, HSBC also note that under more severe, combined downside scenarios, the funding gap will increase and the AAHK will need to seek additional financing to meet this.

HSBC also concurs with the proposed action plan of the AAHK to:

• ensure that the scope of 3-Runway Scenario is consistent with the level of

services that the Airport intends to provide

• continue to review and refine CAPEX estimates after the planned DCM trials, EIA process and more detailed design work have been undertaken

HSBC recommends that the financial plan for the 3-Runway Scenario is reviewed and updated in light of the outcome of these trials and other additional work to refine the cost estimates.

Disclaimer

This report has been prepared at the request of the Airport Authority Hong Kong ("HKAA") in accordance with the service agreement (dated 29 November 2009, as amended from time to time) between The Hongkong and Shanghai Banking Corporation Limited ("HSBC") and HKAA. This report has been issued by HSBC to HKAA only, and subject to the terms of the aforementioned service agreement. Neither the whole nor any part of the information and analysis in this report may be used or relied upon by, any other person or used for any other purpose whatsoever without HSBC's prior written consent.

The information used in HSBC's analysis has been obtained in part from HKAA in written form and verbal advice and/or was obtained from public sources. None of this information has been independently verified by HSBC or any of its connected persons. Accordingly, neither HSBC nor any of its connected persons accept any liability or responsibility for the accuracy or completeness of this information and do not make any representation or warranty (express or implied) with respect to its accuracy or completeness or for any errors or misstatements, nor that the information remains unchanged after the issue of this report.

Nothing in the report is, or should be relied upon as, a promise or representation as to the future. Any statements of opinion and/or belief contained within this report are subjective statements only and no reliance should be placed on such statements of opinion and/or belief as being true or accurate. Neither HSBC nor any of its connected persons accepts any liability for any loss or damage arising as a result of any decision or investment made based on this report.

In this notice, "HSBC" means The Hongkong and Shanghai Banking Corporation Limited and "connected persons" means the shareholders, subsidiaries and affiliates of HSBC and the respective directors, officers, employees and agents of each of them.