



UCL

PROJECT PROFILE

Hong Kong

Airport Railway

omega centre

Centre for Mega Projects in Transport and Development

A global Centre of Excellence in Future Urban Transport
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This report was compiled by the University of Hong Kong.

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List of abbreviations

AA	Airport Authority
ACC	Airport Consultative Committee
ACE	Advisory Council on the Environment
ACP	Airport Core Programme
AEL	Airport Express Line
CTS-2	Second Comprehensive Transport Strategy
EPD	Environmental Protection Department
HK	Hong Kong
HKLII	Hong Kong Legal Information Institute
HKMAO	China's Hong Kong and Macau Affairs Office
HKPSG	Hong Kong Planning Standards and Guideline
JLG	Sino-British Joint Liaison Group
KCRC	Kowloon Canton Railway Corporation
LegCo	Legislative Council
MOU	Memorandum of Understanding
MTRC	Mass Transit Railway Corporation
NAPCO	New Airport Projects Co-ordination Office
PAA	Provisional Airport Authority
PADS	Port and Airport Development Study
TCL	Tung Chung Line
UDHK	United Democrat for Hong Kong

Notes:

All money stated in the report refers to Hong Kong Dollars (HKD).

'HK Government' refers to the Hong Kong Government before the handover on 1 July 1997.

'HKSAR Government' refers to the Hong Kong Special Administrative Region Government after the handover on 1 July 1997.

A INTRODUCTION

After many years of speculation, on 11 October 1989 the Hong Kong Government announced the development of a new international airport for the city, to be located on Chek Lap Kok, an island off Lantau. The Hong Kong International Airport was to replace the Kai Tak International Airport. As part of the new airport development, an innovative dedicated fast railway service directly between the city centre and the airport was built. It is the world's first railway built specifically to serve an airport, with an integrated design for stations and equipment (NAPCO, 1998). The Airport Railway provides two services: the 31.1km Tung Chung Line and the 34.8km Airport Express Line. It serves travelers transporting to and from the airport, but also provides a service to the new town in Lantau.

Type of project

Following the announcement of the relocation of Hong Kong's international airport to Chek Lap Kok, the construction of various developments and links involved with this relocation were decided. A rail link from the central business district to the airport was perceived as essential (Lands and Works Branch, 1989).

When the service was first opened in 1998, the Airport Express Line (AEL) comprised 8km of rail constructed in tunnels, 6km of elevated structures and 20km of at-grade track, adding a total of 34 km (Wong, 1998). Today, the AEL has a total length of 35.5km, running between the CBD and the Asia World Expo (MTRC, 2007a). The journey between the Airport and Central takes 23 minutes (Pitman, 1996a).

The government-owned Mass Transit Railway Corporation (MTRC) was responsible for managing and overseeing the construction, finance and operation of this HKD 35.1bn project (MTRC, 1995b).

As part of the Airport Core Programme (ACP) (Figure 1), the Airport Railway project relied significantly on 'embedded' works in the government contracts of the ACP. It was designed to be built in conjunction with government highways, reclamation works and bridge construction to minimise cost and make best use of resources (MTRC, 1994).

Location

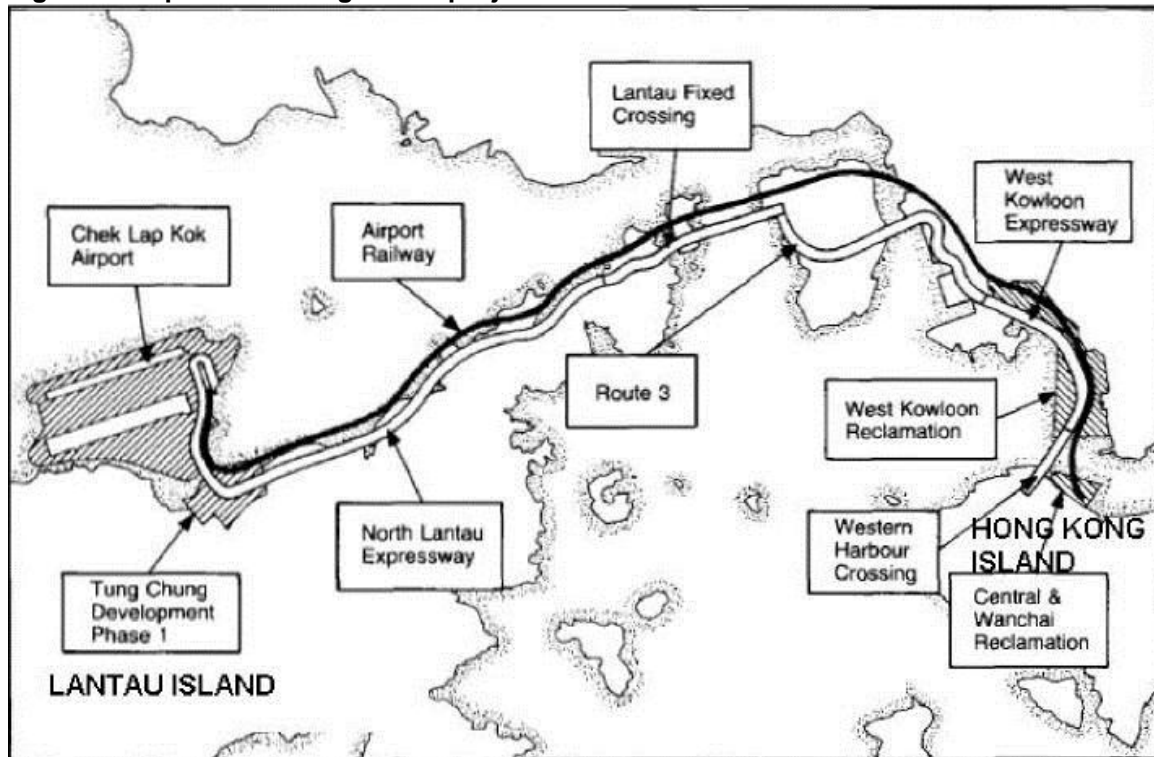
Airport Railway is located in the western part of Hong Kong (Figures 2 and 3). The Airport Railway project links the Hong Kong International Airport and the rest of Hong Kong as well as giving essential relief to the existing mass transit railway system (Figures 4 and 5). It consists of two lines, the high speed Airport Express Line (AEL) and the domestic Tung Chung Line (TCL) (NAPCO, 1998). The two lines run alongside one another but have individually dedicated platforms. The AEL served four stations, namely Hong Kong, Kowloon, Tsing Yi and Chek Lap Kok, when it first opened in 1998, and AsiaWorld Expo became the fifth station when it opened in December 2005 (Figure 6). The TCL connected Tung Chung new town on Lantau Island with stations at Tsing Yi, Lai King, Olympic (formerly known as Tai Kok Tsui), Kowloon and Hong Kong when it first opened in 1998. Nam Cheong and Sunny Bay Stations were built later and opened in 2003 and 2005 respectively (MTRC, 2007a; Highways Department, 2008) (Figure 7).

Scope of the project profile

As the AEL and TCL were planned, financed and constructed as one project (Airport Railway) in the ACP, this project profile will generally discuss both the AEL and TCL, and will

refer to them as Airport Railway unless specified otherwise. However, information on feasibility studies, fares and fare revenue, and ridership were provided separately in the data sources collected, thus these will only be examined in the context of AEL.

Figure 1: Airport Core Programme projects



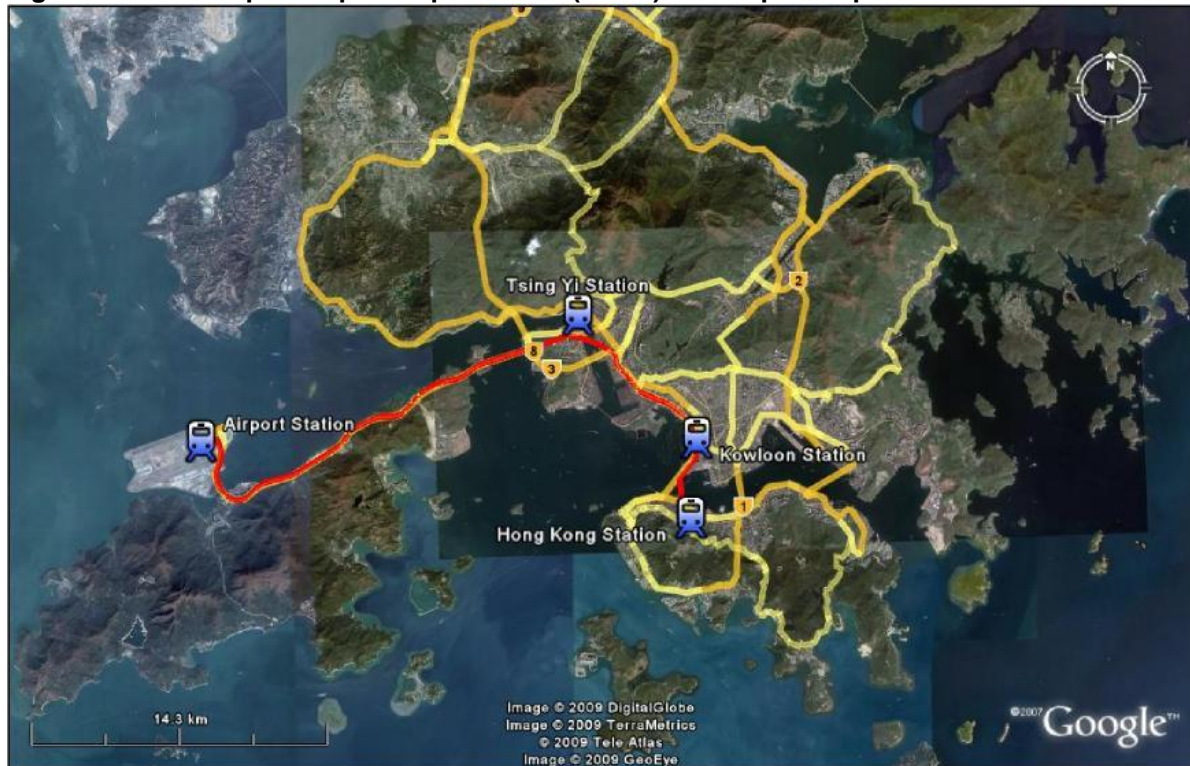
Source: Blake (1994)

Figure 2: Map of the Hong Kong Special Administrative Region of China (HKSAR)



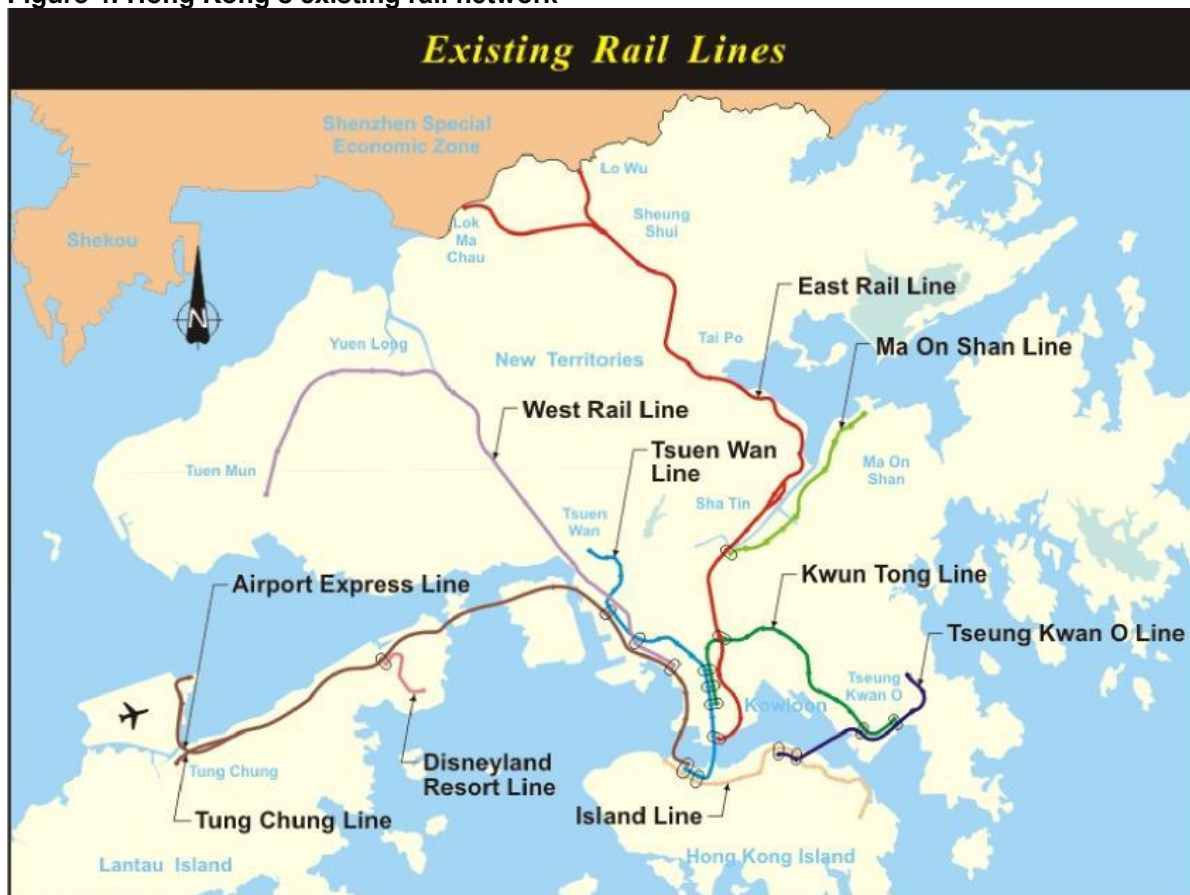
Source: Google (2009a)

Figure 3: Aerial Map of Airport Express Line (in red) and Airport Express Line Stations



Source: Google (2009b)

Figure 4: Hong Kong's existing rail network



Source: Highways Department (2009)

Figure 5: MTR Network map



Source: MTRC (2009c)

Figure 6: Map of Airport Express Line



Source: Highways Department (2009)

Figure 7: Map of Tung Chung Line



Source: Highways Department (2009)

B BACKGROUND TO PROJECT

The need for the Airport Railway

Following the Hong Kong Government's announcement in October 1989 of its intention to build Hong Kong's new airport at Chek Lap Kok, the Government decided to construct a passenger rail line to serve the airport. Apart from the need for a railway servicing the new airport, it was indicated that there was a pressing need to relieve congestion in the Nathan Road section of the Tsuen Wan Line. This could be achieved by the TCL, with interchanges created between the old and new lines (Budge Reid, 1999).

In fact, it was questioned whether the Airport Express was needed on the first day of airport operation, since there would be no congestion on roads to the airport in the early years. As the feasibility study progressed, it became clear that the initial ridership would not meet original expectations. However, given air passenger forecasts and road bridge toll assumptions, the project would remain viable even with no protection from competition. Therefore, it was confirmed that the AEL should be available from 'day one' of the new airport's opening (Budge Reid, 1999).

Principal project objectives

Government objectives (for both AEL and TCL):

- to serve as an express service from the airport to the urban areas;
- purposely designed and built to offer the maximum comfort and convenience to airport users;
- to serve the new developments on the West Kowloon Reclamation;
- to provide a third cross harbour rail link;
- to relieve the crowded Nathan Road section of Tsuen Wan Line.

(Transport Branch, 1990)

MTRC objectives:

- to serve the new airport;
- to alleviate congestion in the existing network which was saturated, especially in the Kowloon area;
- there should be an acceptable commercial return on the investment.

(Budge Reid, 1999)

Key enabling mechanisms and decision to proceed

The key piece of enabling legislation for the construction of the railway is the 'Mass Transit Railway (Land Resumption and Related Provisions) Ordinance (Cap. 276)'. It is "to provide for the resumption of land, creation of easements or rights and the exercise of their powers by the Government in aid of the construction and operation of a Mass Transit Railway and to make provisions as to compensation for losses caused by the exercise of such powers" (HK Government, 1998).

Another key piece of legislation is the 'Mass Transit Railway Ordinance (Cap. 556)'. Under

the Ordinance, MTRC is granted powers to construct and operate the Mass Transit Railway, including any extensions and any other railway which the Secretary for Transport has authorized MTRC to construct (HK Government, 2000).

Key enabling mechanisms timeline

An overview of the timeline associated with the key enabling mechanisms is presented as follows:

May 1989

Various studies about whether to build a replacement airport at Chek Lap Kok were undertaken before 1989. According to the 'Second Comprehensive Transport Strategy (CTS-2)' published in May 1989, sensitivity tests were undertaken for the year 2001 in order to assess the impact of a new airport. It predicted that the location of the new airport would generate a substantial volume of new traffic in the west of the territory, in which several new highways were planned but no rail connections to the airport were assumed for 2001. It stated that the timing of an airport rail link would depend on the build-up of new population and employment at the new airport site (Transport Dept, 1989).

October 1989

The Government announced its decision to move the airport from Kai Tak to Chek Lap Kok (Airport Authority, 2009b).

December 1989

In the 'Port and Airport Development Strategy (PADS)' published in December 1989, two types of rail service to the new airport were considered, a 'dedicated' service and a 'public' service. Details of these services are shown in the next section. It was agreed by the Government that a railway would be programmed to be in service at airport opening. Yet further feasibility studies, particularly on modal split and the form of urban terminal, were required (Lands and Works Branch, 1989).

January 1990

'Moving into the 21st Century - the White Paper on Transport Policy' was published and provided reassurance that the Airport Railway was one of the recommended railway projects. It was planned for completion by 1997 (Transport Branch, 1990)

March 1991

The 'Airport Railway Feasibility Study Final Report' was published in March 1991. It was commissioned by the Highways Department – Airport Railway Division, and was prepared by Freeman Fox Maunsell. The Study also included an environmental assessment (Freeman Fox Maunsell, 1991a).

September 1991

On 3 September, the British Government and the Chinese Government signed the 'Memorandum of Understanding Concerning the Construction of the New Airport in Hong Kong and Related Questions (MOU)', giving their firm support for the airport project and the Airport Core Programme as a whole (Airport Authority, 2009b). In particular, the MOU stated that the British side was required to consult the Chinese side before the HK Government granted major airport-related franchises or contracts straddling 1997 (HK Government,

1991).

1993

Preparatory work for the construction of the Airport Railway began (MTRC, 1995).

November 1994

Agreements were finally reached between the Chinese and British Governments for the financing of the airport and Airport Railway. The 'Agreed Minute' was signed by both Governments. An equity injection from LegCo was approved subsequently (MTRC, 1995).

June 1995

The 'Financial Support Agreements' were signed by Chinese and British Governments. They reaffirmed their support for the Airport Railway project. Further financial arrangements with banks could now begin (Kennedy & Fung, 1 Jul 1995).

July 1995

The Government and MTRC signed the 'Airport Railway Agreement', an agreement for the design, construction, financing and operation of the Airport Railway (MTRC, 1997).

Feasibility studies

Joint studies for a railway link and a series of feasibility studies were undertaken by MTRC and the Government after the decision to locate Hong Kong's new airport at Chek Lap Kok.

December 1989 – Port and Airport Development Strategy (PADS)

According to PADS, various forms of public railway were considered. At first, the concept of an airport rail link was rejected on the grounds that it would not attract sufficient passengers. After a series of analyses were carried out, it was concluded that the road network would be unable to cope with the traffic generated by the airport. Consequently, the Civil Aviation Department initiated a review, by British Airports Services Limited, and considered the proportion of air passengers likely to use a high speed railway designed specifically for their convenience. The review also considered the economic and financial viability of this railway and how it might be used to reduce or delay the need for new highways (Lands and Works Branch, 1989).

Two types of rail services recommended by the review were considered by the Government. The first was a 'dedicated' service (the Airport Express Line) which would have no intermediate stops between the airport and the central urban areas. Carriages and terminals would be specifically designed for air travelers. Another was a 'public' service (the Tung Chung Line) which would have a number of intermediate stops. It would be more frequent yet slower than the 'dedicated' service. As the optimum alignment for both lines would be similar, a service combining the two could be economically viable (Lands and Works Branch, 1989).

August 1990 – Interim Report

This report summarized the service and alignment options available and recommended a preferred operational plan and alignment (Freeman Fox Maunsell, 1991a).

The main recommendations of the Interim Report were presented on 20 September 1990,

although additional studies of the timing of implementation of the Railway and assessment of the effects of various implementation options were needed (Freeman Fox Maunsell, 1991a).

The Government appointed Kleinwort Benson as financial consultant for the railway study (Stoner, 20 May 1990).

October 1990 – Draft Final Report

A draft of the final Airport Railway Feasibility Study was published. Comments from interested parties were received, and responses incorporated in the Final Report (Freeman Fox Maunsell, 1991a).

November 1990 – Financial Study

To enable the financial consultants to complete their study in parallel with the Additional Studies Report, detailed cost and revenue data were issued between 23 and 30 November 1990 (Freeman Fox Maunsell, 1990).

December 1990 – Additional Studies Report

This Report was undertaken in parallel with the Draft Final Report. It assessed the effects of various implementation options (Freeman Fox Maunsell, 1990).

March 1991 – Airport Railway Feasibility Study Final Report

The primary feasibility study for the Airport Railway was published in March 1991. It was commissioned by the Highways Department – Airport Railway Division and was prepared by Freeman Fox Maunsell. The joint venture consultants included Maunsell Consultants Asia Ltd. and Acer Consultants (Far East) Ltd, in association with MVA Asia, Parsons Brinckerhoff (Asia) Ltd. and CES/Acer Environmental. The Report assessed and selected the best alignment for the urban section of the line and examined patronage, revenues and operations. It also included an environmental impact assessment, which determined the necessary mitigation measures to be incorporated. This will be discussed in 'Environmental issues and ecological mitigation' (Freeman Fox Maunsell, 1991a, 1991b).

More information on route alignment will be examined in 'Project key issues'.

The Report not only demonstrated that building the Railway was technically and financially viable, but also recognised its potential for providing essential congestion relief to the Nathan Road section of the Tsuen Wan Line, through an interchange at Lai King (Crighton & Budge-Reid, 1998).

January 1994 – Lantau and Airport Railway: Environmental Impact Study Final Report

This report was prepared by ERM Hong Kong (Environmental Resource Management Hong Kong Limited) on behalf of MTRC as part of the Airport Railway Agreement. It examined the proposed design, construction and operation of Airport Railway from an environmental perspective, and generated some mitigation measurements (ERM, 1994).

Others – Stations Design Feasibility Studies

In 1992, MTRC established an in-house project management team and committed design work for the Airport Railway (MTRC, 1995).

MTRC Design Manual's standards have been adopted to establish the key architectural

design requirements to be followed by each of the architects who would be employed to design the stations and master plans for associated developments (Griffiths, 1996).

A feasibility study for Hong Kong Station was carried out by Freeman Fox Maunsell (Griffiths, 1996). The feasibility of providing in-town baggage check-in facilities was studied in conjunction with the Provisional Airport Authority (MTRC, 1993a).

Main organisations involved

Mass Transit Railway Corporation (MTRC)

MTR Corporation was established in 1975 with a mission to 'construct and operate, under prudent commercial principles, an urban metro system to help meet Hong Kong's public transport requirements' (MTRC, 2009a). The sole shareholder was the HK Government. In June 2000, MTRC was re-established as the Mass Transit Railway Corporation Limited after HKSAR Government sold 23% of its issued share capital to private investors. MTRC shares were listed on the Hong Kong Stock Exchange on 5 October 2000. Today, MTRC runs as corporate governance (MTRC, 2009a).

MTRC was responsible for the design, construction and operation of the Airport Railway. It was also responsible for the project management of contracts (Budge-Reid et al., 1997).

In conjunction with railway construction, MTRC has led, jointly with third parties, property developments above stations and depots. The principle adopted has been that MTRC obtained government consent to develop airspace above or adjacent to the selected railway sites. It then entered into agreements with property developers to build, at their own expense, developments to the MTRC's standards. Developers paid a land premium to the Government and the profits were shared when property was sold (MTRC, 1996a).

Up to February 1994, MTRC hired 524 planners and designers although the financial arrangement for the project was yet to be approved by the Chinese Government (HKS, 6 Feb 1994).

Government bodies and departments

Provisional Airport Authority (PAA)

On 4 April 1990, the Provisional Airport Authority was established under the Provisional Airport Authority Ordinance with a mandate to plan, design and construct Hong Kong's new airport (Airport Authority, 2009b). It also had the power to appoint contracts, engage staff, acquire assets and accept liabilities (Becker, 2 Jan 1991).

Airport Authority (AA)

The Airport Authority Hong Kong is a statutory body. It was established in 1995 to operate and maintain Hong Kong International Airport. It is wholly owned by the HKSAR Government and governed by the Airport Authority Ordinance (Ch. 483) (Airport Authority, 2009c).

Sino-British Joint Liaison Group (JLG)

This group was set up to negotiate airport related issues straddling 1997. In particular it was involved substantially in the financing of the airport and Airport Railway. Members include Chinese and British senior government officials.

Sino-British Joint Liaison Group's Airport Committee

Representatives of the British and Chinese Government gathered to discuss any matters related to the airport and its associated projects.

Sino-British Land Commission

The Commission was involved in examining and approving land grants to MTRC for property developments along the line.

Airport Consultative Committee (ACC)

The Committee was set up to oversee negotiations between Britain and China. It discussed any matters relevant to the ACP but did not have decision-making powers and could not delay the progress of the projects (HK Government, 1991a).

China's Hong Kong and Macau Affairs Office (HKMAO)

Spokesmen of the Office expressed views and concerns on the financing of the airport and its rail link on behalf of China from time to time.

New Airport Projects Co-ordination Office (NAPCO)

This office was responsible for day-to-day coordination of the implementation of the ten Airport Core Programme projects.

Hong Kong Legislative Council (LegCo)

Legislators (particularly the Finance Committee) were responsible for approving Government funds to finance the Airport Railway. In particular, they approved the HKD 23.7bn funding to MTRC.

Transport Department

This department published several transport planning studies and was responsible for the initial planning for constructing a third harbour-crossing railway.

Highways Department

This department was involved in planning and recommending the construction of the Airport Railway, and also commented on the alignment of the line.

Lands Department

This department was responsible for setting the land premiums for the five property development sites along the route.

Town Planning Board

The Board was responsible for approving planning applications and master plans for the property developments along the route.

Territory Development Department and Planning Department

These departments were involved in commenting on the route alignment of the Airport

Railway and the planning of property developments along the route.

Environmental Protection Department (EPD)

This department endorsed the 'Lantau and Airport Railway: Environmental Impact Study Final Report (EIS)'.

Advisory Council on the Environment (ACE)

The Council, a committee under the EPD, was formerly known as the Environment Pollution Advisory Committee. It was responsible for reviewing the state of the environment, in particular ensuring appropriate measures were taken to combat various types of pollution (EPD, 2007). For the Airport Railway project, it endorsed a number of measures to reduce noise along the railway (Griffin, 1 Feb 1994).

Kwai Tsing District Council

Residents at Lai King complained to district councilors of Kwai Tsing District Council about noise pollution during the construction of the Airport Railway. Councilors helped them to express their views to relevant government departments and MTRC.

Contractors

In general, consultants were responsible for preparing detailed designs, tender drawings and quantities, whilst the MTRC were responsible for the general scope of the work, co-ordination of design, control of consultants, and contract documentation. The main contractors and consultants involved in the project are shown in Table 1.

Table 1: List of main contractors and consultants

Projects	Stakeholders	Responsible for... / Remarks	Source
Hong Kong Station	<ul style="list-style-type: none"> MTRC HK Government Freeman Fox Maunsell Ove Arup & Associates Rocco Design Partners Davis Landon and Seah Mainhardt M&E Ltd Arup Associates Redland Concrete Ltd Aoki Corporation 	<ul style="list-style-type: none"> The developer Works related to Hong Kong Station including new roads and drains on the reclamation, ten footbridges, an underpass and flyover Conducted the feasibility study The detailed architectural design of the station Appointed to masterplan the reclamation site and station design Quality Surveyor Engineering and Mechanics Civil, geotechnical and structural design Main concrete supplier The construction contract awarded in June 1995 	Black, 1998; Budge-Reid, 1998; Collins, 2003; Crighton & Mackie, 1997; Griffith, 1996
Hong Kong Station Property Development	<ul style="list-style-type: none"> Rocco Design Ltd Skidmore Owings Merrill and Cesar Pelli & Associates Cesar Pelli & Associates 	<ul style="list-style-type: none"> Design of office towers in Hong Kong Station development Design of property development attached to Hong Kong Station 	Anonymous, 1997a
Central Reclamation	<ul style="list-style-type: none"> Dragages-Penta-BSG joint venture Bachy Soletache B&B Construction (formerly called Franki), Gammon Construction & Tysan Group 	<ul style="list-style-type: none"> Appointed to do the reclamation work Sub-contracted to do the diaphragm wall work Responsible for the bored piling work 	Mackie, 1997
Western Immersed Tube tunnel	<ul style="list-style-type: none"> MTRC Kumagai Gumi (Japan) & Tarmac International (Major Projects) Ltd. (UK) Hyder Consulting Ltd (formerly known as Acer Consultants Ltd) (Designer) 	<ul style="list-style-type: none"> Undertook a series of feasibility studies of Western Immersed Tube site in 1992 Value at HKD 0.599bn for design Commenced in June 1994 Undertaken on behalf of MTRC (Employer) Design and construct contract Employed by Kumagai-Tarmac JV (KTJV) To prepare the tender design on the behalf of KTJV Awarded a design contract as designers for the permanent works 	Black, 1998; Budge-Reid <i>et al.</i> , 1997; Crighton & Budge-Reid, 1998; Morris <i>et al.</i> , 1997

Projects	Stakeholders	Responsible for... / Remarks	Source
		and for independent checking of KTJV's own temporary works design	
Western Immersed Tube tunnel	<ul style="list-style-type: none"> Operator of Macau Ferry Terminal 	<ul style="list-style-type: none"> Since the southern end of the WIT alignment passes close to the Macau Ferry Terminal, MTRC had to liaise with the Terminal operator to determine the boundary and ensure safe access for ferries. 	Budge-Reid <i>et al.</i> , 1997
Kowloon Station	<ul style="list-style-type: none"> Kumagai Gumi (Japan) & Entrecanales Cubiertas (now NECSO) of Spain JV Ove Arup and Partners Parsons Brinckerhoff (Asia) 	<ul style="list-style-type: none"> Main contractor Designer and Engineer for the civil/ structural work Electrical and Mechanical Designer 	Black, 1998; Pitman, 1997
Kowloon Station Property Development	<ul style="list-style-type: none"> Terry Farrell & Partners 	<ul style="list-style-type: none"> Appointed to design building structure features For master planning of the 13.6 hectare site with residential, commercial, retail and hotel developments 	Collins, 2003
Olympic Station	<ul style="list-style-type: none"> CYS Associates (HK) Hip Hing Construction B+B Construction 	<ul style="list-style-type: none"> Architects for the station design Main contractor Responsible for the foundation work of the development 	Anonymous, 1998
Tsing Yi Station	<ul style="list-style-type: none"> Kumagai Gumi- Maeda JV 	<ul style="list-style-type: none"> Construction contractor 	Anonymous, 1998
Tung Chung Station	<ul style="list-style-type: none"> Aoki Corporation Rocco Design + MTRC + Architectural Department 	<ul style="list-style-type: none"> Construction of the station and associated tunnel and reclamation works Responsible for Tung Chung Station design 	Anonymous, 1998
Contractor's design	<ul style="list-style-type: none"> Travers Morgan International (now part of Symonds Group) Rendel Palmer and Tritton 	<ul style="list-style-type: none"> Engaged by MTRC to provide an independent check on the Contractor's design To prepare a design brief including particular design and technical specifications 	Budge-Reid <i>et al.</i> , 1997
Siu Ho Wan Depot	<ul style="list-style-type: none"> Liang Peddle Thorp Architects & Planners Ltd Maunsell Consultants Asia Ltd. Meinhardt Consulting Engineers Widnell Chartered Quantity Surveyors Jardine Engineering 	<ul style="list-style-type: none"> Architect responsible for the Depot design Architect responsible for the Depot design Engineers Quantity Surveyors Supply and install equipment for the Depot 	Anonymous, 1998; SCMP, 16 Dec 1993c

Design Steering Group

This group was set up to manage and respond questions arising from the feasibility studies. Members included operators and maintainers of the MTR system and members of the MTRC marketing and planning divisions. The design standards and specifications of the feasibility studies, which had been used to design and construct the existing lines, were reviewed by the Steering Group. They incorporated new knowledge obtained from operating the existing system and addressed new requirements (Budge Reid, 1999).

Planning and environmental regime

Outline of planning regime

The Airport Railway project was an ambitious government-driven plan to modernize the entire territory. It was conceived as part of an overall urban development plan rather than just an addition to the transit network (Tiry, 2003).

The Airport Railway Agreement sets out the Railway planning regime. It was signed between the Government and MTRC on July 1995. Under the Agreement, MTRC had carried out all the environmental studies required and identified necessary environmental protection measures. The Agreement also included details of design and financial statements between the two parties (MTRC, 1997; LegCo, 2000).

Environmental issues and ecological mitigation

As part of the Airport Railway Feasibility Studies, the Airport Railway Feasibility Studies Environmental Assessment (EA) was prepared in 1991 by Freeman Fox Maunsell, commissioned by the Airport Railway Division of the Highways Department. It predicted “the nature and extent of potential environmental impacts arising from the construction and operation of the Airport Railway”. It also “determined mitigation measures to be incorporated in the detailed design” (Freeman Fox Maunsell, 1991b). The Study aimed to:

- ensure that environmental factors were taken into consideration in the choice of alignment;
- minimise environmental impacts;
- improve project design through ongoing advice to the engineering team, ensuring the project meets the relevant environmental quality standards;
- ensure consistency with planned land uses.

This Report concluded that the construction and operation of the Airport Railway could be undertaken without significant long-term environmental impacts (Freeman Fox Maunsell, 1991b).

A consequence of the agreement between HK Government and the MTRC was a requirement for an Environmental Impact Study (EIS), known as ‘Lantau and Airport Railway: Environmental Impact Study Final Report (EIS Report)’. The study was conducted in 1994 by ERM Hong Kong on behalf of MTRC. Its objectives were set out in the Consultancy Agreement developed by the Environmental Protection Department and MTRC. Similar to the EA prepared in 1991, this Report identified, predicted and evaluated the environmental impacts and cumulative effects which might arise during the construction and operational phases of Airport Railway. In particular, it recommended mitigation measures in accordance with Hong Kong Planning Standards and Guidelines (HKPSG) and relevant Government Ordinances (ERM, 1994).

The following impacts and mitigation were summarized from these two reports.

Noise and vibration

Affected areas influenced by noise and vibration at construction and operation stage were identified, mainly in Tsing Yi and Lai King. During the construction stage, significant noise levels from certain Airport Railway stations and associated structural work were predicted to exceed the requirements of the Noise Control Ordinance. The four main sources of construction noise were piling, general construction machinery and equipment, haulage, and blasting. Nevertheless, careful monitoring and mitigation such as screening and insulation would be able to minimise the impacts. Also, contractors were required to submit full details of plant requirements and programme and were responsible for the implementation of measures to reduce construction noise to acceptable levels (ERM, 1994; Freeman Fox Maunsell, 1991b).

As for noise impacts during operation, the major identified adverse impact was that some residential areas would be affected by train noise. Mitigation measures would involve adding noise barriers or secondary glazing and associated ventilation plant (ERM, 1994).

Air quality

In general, the main impact on air quality would be dust generated during construction, particularly in Central and Tai Kok Tsui. Control and mitigation measures were adopted through the use of statutory powers and contract requirements, in compliance with the Air Pollution Control Ordinance. Simple measures such as frequent watering on construction sites, no burning of debris and containment of dusty materials were adopted (ERM, 1994; Freeman Fox Maunsell, 1991b).

There was also the potential risk of the release of landfill gas, such as methane, hydrogen sulphide and carbon dioxide, during construction and operation at Kwai Chung Park. This posed consequent risks of explosion, asphyxiation and odours. However, these risks could be fully controlled through landfill engineering measures and special monitoring (Freeman Fox Maunsell, 1991b).

At operational stage, since the trains are electrically powered, the effect on air quality would be insignificant (Freeman Fox Maunsell, 1991b).

Water quality

Water quality would be impacted by the dredging in Rambler Channel and Victoria Harbour, which could be minimised. Additionally, there was a risk of groundwater contamination due to the release of landfill leachate at Kwai Chung Park. Precautions included immediate removal of excavated fill for disposal at another landfill, and rapid covering of excavated sections to prevent infiltration of rainwater. Thirdly, construction runoff might cause both physical and biological effects on receiving waters within the West Kowloon Reclamation. Mitigation measures included locating the discharge points for construction runoff far from sea water intakes; proper site management; and drainage facilities to control contaminated runoff (ERM, 1994; Freeman Fox Maunsell, 1991b).

The potential water quality impact at operation stage was a change in temperature when cooling water was discharged from stations, although the impact would not be significant (ERM 1994).

Visual and land use impacts

In the short term, visual and land use disruption during construction would be greatest at Tsing Yi, Kwai Chung Park and Lai King. In the long term, severe visual impacts on Rambler Channel could be expected. The only way to mitigate this would be through a radical realignment of the bridge (Freeman Fox Maunsell, 1991b).

Long term land use impacts were fairly limited because the above ground sections of the railway run either on elevated structures or at grade directly below the expressway. Also, as the construction of Airport Railway was taken into account at the planning stage of reclamation, land use impacts were not significant. Nonetheless, there might be a permanent loss of open space and amenity land (ERM, 1994; Freeman Fox Maunsell, 1991b).

New town development and redevelopment

As the Airport Railway runs mostly on reclaimed land and less developed areas, five new property developments sites were proposed and built. Eventually these developments are intended to become new urban centres serving their neighbourhood and region. Further details are discussed in 'Main stations'.

In particular, Tung Chung is a new town built to service the new airport and other new development on the north shore of Lantau Island, which was mainly reclaimed land. As planned in PADS, Tung Chung was identified as the airport support community accommodating a population of 150,000 (Lands and Works Branch, 1989). In addition, the Government's 1992 projection envisaged a population of 20,000 in 1997 and 4,100 job opportunities in Tung Chung (Wong, 14 Sept 1992). Long-term land use patterns for Tung Chung were identified in the 'North Lantau Development Study'. The ultimate target of the new town development was for a population of 260,000 by 2011 (Leung, 18 March 1991).

Apart from new development in Tung Chung, Tai Kok Tsui would benefit from the nearby Tai Kok Tsui (Olympic Station). For instance, flat prices in Tai Kok Tsui would rise due to proximity to the railway. However, as most flats were individually owned, redevelopment in this area would be difficult (Fellman, 16 Jun 1994).

Land acquisition

The railway tracks and property development of the Airport Railway are mainly built on new reclaimed land and on newly built ACP infrastructure such as the West Kowloon Expressway. Therefore, the Government had to grant the land to MTRC.

Under the Joint Declaration, the Government can grant only up to 50 hectares of new land each year unless the Sino-British Land Commission approves the ceiling (Wong, 13 Jan 1992).

On 17 November 1994, the Sino-British Land Commission agreed to grant 62 hectares of land to MTRC before 30 June 1997, subject to annual allocations in the Land Disposal Programmes in subsequent financial years. The Programme would be drawn up depending on the actual needs of the associated property development at the Airport Railway stations and the prevailing supply and demand conditions in the property market at the time (MTRC, 1994).

In particular, about 58 hectares of railway track and related facilities would be included in the 1996-97 land disposal programme for the MTRC at a nominal price. About 30 hectares for

the Airport Railway depot on Northern Lantau Island would be included in the 1994-95 land disposal programme for MTRC at an appropriate price. Also, about 60 hectares for the railway stations and associated property developments would be included in the 1994-95 to 1996-97 land disposal programme for MTRC. All land would be leased up to 30 June 2047 (Lim, 18 Nov 1994).

The entire property development provides nearly 3.5million m² of floor area for residential, office, retail and hotel use (MTRC, 2007b).

Under the Airport Railway Agreement related to the construction of the Airport Railway, the Government granted to MTRC development rights on the land (i.e. Land Grant) over the five station sites along the railway at full market value land premium for property development. The land premium was to be payable when the development of the relevant site commenced. For large sites comprising a number of portions bearing different development commencement dates, the land premium could be paid sequentially according to the development programme (MTRC, 1994; MTRC, 2008).

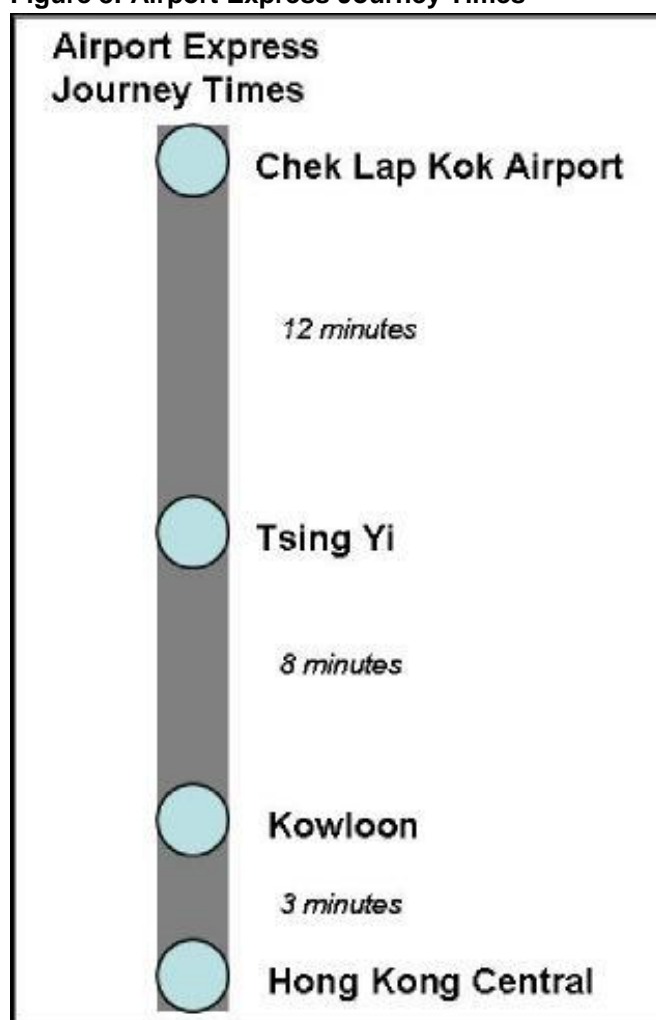
C PRINCIPAL PROJECT CHARACTERISTICS

Route description

As the decision was made to construct a new airport at Chek Lap Kok, MTRC took up the challenge of constructing a new rail line across difficult terrain. The Airport Railway has two services – the Airport Express Line and Tung Chung Line. The transport corridor to the airport was newly built, thus the railway had to fit within the highway corridor whenever possible.

The Airport Express first leaves Hong Kong Station on the Central Reclamation of Hong Kong Island. It runs through the Western Immersed Tube Tunnel to cross the harbour and reaches Kowloon Station on the West Kowloon Reclamation. It follows the railway corridor alongside the West Kowloon Expressway. It carries on through Tai Kok Tsui Tunnels, passes Olympic Station, Kwai Chung Viaducts near Lai King, Lai King Station and tunnels, and Kwai Chung Park Viaducts. It then arrives at the third station, Tsing Yi Station, on the four-tracks Rambler Channel Bridge. From there, it continues crossing Tsing Yi Tunnels and Viaducts, Lantau Link (formerly known as Lantau Fixed Crossing) and East Lantau Tunnels, and finally runs alongside the North Lantau Expressway. It runs in the enclosed lower deck of the Lantau Fixed Crossing. Lastly, it approaches the Airport Station at Chek Lap Kok.

Figure 8: Airport Express Journey Times



Source: MTRC (1993a)

Figure 9: Airport Express Train



Source: MTRC (2008)

Main stations

Under prudent commercial principles, MTRC adopted the 'linear city' concept to create developments at strategic points along the route. Similar to previous MTRC lines, the AEL incorporates major property developments above and adjacent to stations. The five stations along AEL and TCL, with an area of nearly 63 hectares, were foresighted for property development by MTRC. MTRC has become a major strategic player in building Hong Kong's future by creating these new residential and commercial hubs. In particular, these integrated property developments were aimed to become self-sufficient in terms of social and recreational amenities, retailing provisions and employment opportunities (Pitman, 1996a).

Phasing of the station developments has been carefully mapped out to avoid a glut of new supply reaching the market at any one particular time. Multiple packages of property development schemes have been planned to be put out to tender. By boosting the extensive road and rail access on the western side of Hong Kong as well as the integrated property development, it is likely to remodel the urban scene in the western part of the territory (MTRC, 1996a).

Planning and design context

The principle of property development, to ensure that the railway planning would be compatible with future development, was acknowledged in feasibility studies. Each of the five sites was considered to be a Comprehensive Development Area (CDA) in its own right. Yet, no firm large-scale schemes were decided in the early planning stages of Airport Railway. The master plan was developed in parallel with the railway design by independent teams. Convergence was achieved at the Town Planning Board statutory approval stage prior to the start of construction (Budge-Reid, 1999). Apart from standards imposed by the Town Planning Board, MTRC has included technical briefs and design standards in the tender invitation documents. Each station design was carried out by an independent architectural office under the guidance of MTRC (Tiry, 2003). The Government's strategy in developing these five sites was to provide more investment opportunities for small developers; therefore, the sites were divided into several smaller lots (Sito, 9 Jan 1995).

The original property development plans pre-dated the financial agreements for the Airport Railway project between British and Chinese Governments, awarding of contracts to

developers and granting approval by the Town Planning Board, and were slightly different from the current plans. Initially, in 1994, the Government envisaged that 24,000 residential flats, 19 office towers of up to 50 storeys, seven hotels and shopping facilities would be built (Lozada, 12 Apr 1994). Today, the five sites provide some 28,000 residential flats, eight office towers of up to 118 storeys, six shopping centres and almost 3,000 hotel rooms (MTRC, 2007b). Table 2 summarizes the details of the property developments.

The following sections investigate some cases in which property developments around Airport Railway stations were used to finance the Airport Railway. Each station development was tendered to various developers. Table 3 lists the developers and completion dates.

Hong Kong Station

Introduction

Hong Kong Station is the terminus for the Airport Railway. It is built on 20 hectares of reclaimed land between Rumsey Street and Pedder Street, just north of Exchange Square. The station, with an area of six hectares, was built in two phases. Phase 1 comprised the construction of a five-level underground station structure. It also included the construction of rail tunnels to connect the Western Immersed Tube Tunnel, footbridges, roads and a public transport interchange (Pitman, 1996a).

Hong Kong Station is linked by the 450m air-conditioned Central Subway to the existing MTRC Central station (Figure 12). The subway passes underneath Pedder Street, Connaught Road Central, Exchange Square and Harbour View Street (Pitman, 1996a; Wong, 1998).

Planning and design context

Dating back to the feasibility studies of the early 1990s, several possible sites for Hong Kong Station were considered and assessed. The Territory Development Department commissioned a feasibility study of alternative locations for Hong Kong Station, such as Star Ferry Pier, in 1991 (Maunsell Consultants, 1991). The detailed design of the station and work on the master plan for the extensive commercial development on the site began in December 1992 and the station contract was awarded on 12 June 1995. Although political challenges slowed down the contract start date, it was opened to the public on time on 22 June 1998 (Anonymous, 1998). The Hong Kong Station project was able to meet its scheduled completion period, which was planned to be eight years (MTRC, 1996a).

Property development

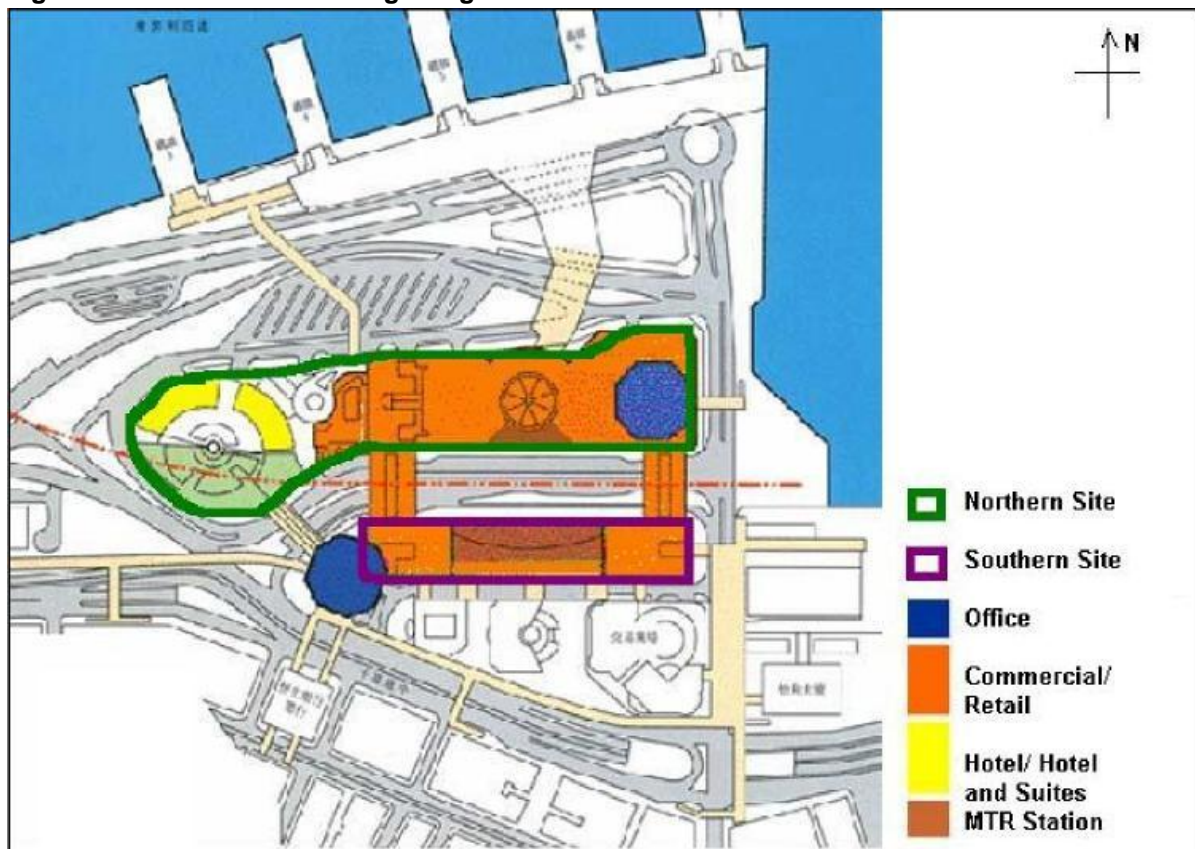
The property development at Hong Kong Station is a comprehensive commercial complex in Central (Figures 10 and 11). With 415,900m² of fully integrated offices, retail and hotel facilities, the development is a joint venture between MTRC and a consortium of developers, Central Waterfront Property Development Limited (MTRC, 2007b). The consortium comprises Sun Hung Kai Properties Ltd (47.5%), Henderson Land Development Co Ltd (32.5%), The Hong Kong and China Gas Co Ltd (15%), and Sun Chung Estate Co Ltd (5%), a subsidiary of the Bank of China Group (Anonymous, 1997a).

The development comprised two sites and was designed and completed in two phases. The Northern Site and the Southern Site are connected by two air-conditioned retail walkways at podium level. The Southern Site (Phase 1) was designed in 1993 and was completed in 1998 with the opening of the super Grade-A office tower One International Finance Centre (One IFC), and the shopping area of IFC Mall. The design of the Northern Site (Phase 2) was carried out in 1998. The construction of the shopping mall at the Northern Site was

completed in early 2003, providing a total shopping area of 59,460m² in a multi-level podium (MTRC, 2007b; Rocco Ltd, 2009).

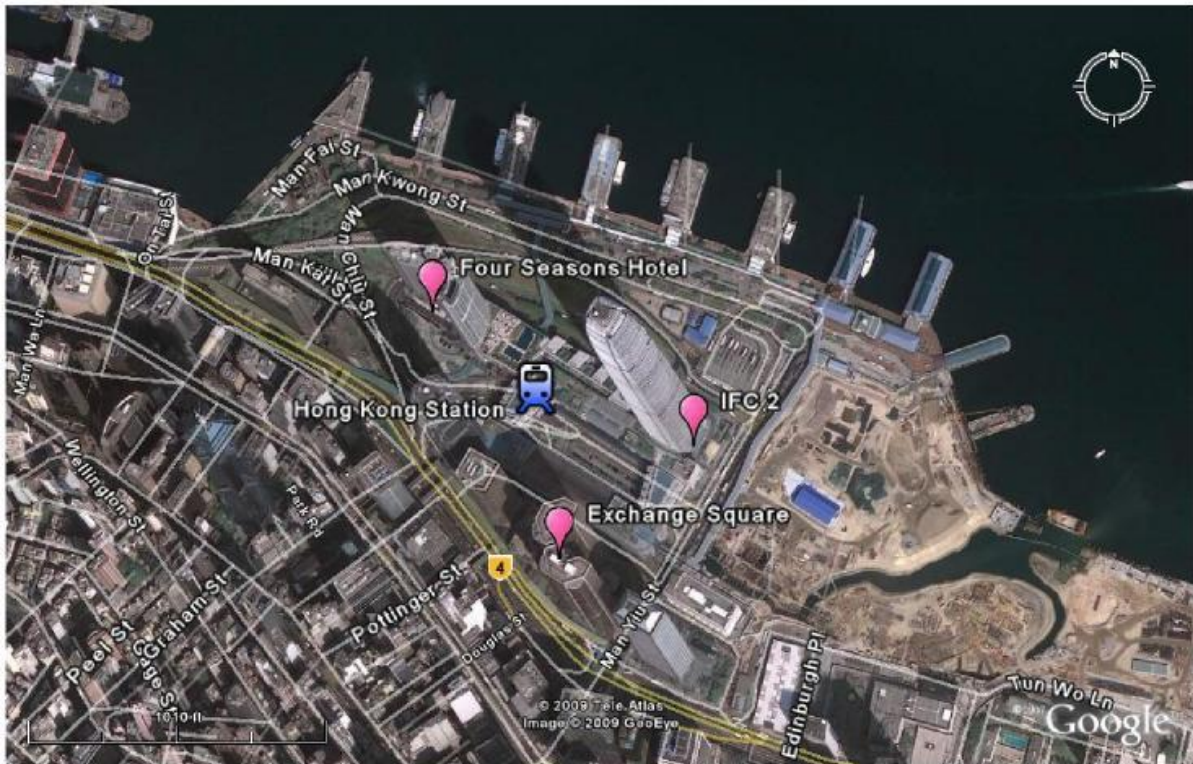
Another super 88-storey Grade-A office tower, Two International Finance Centre (Two IFC) was completed in May 2003, providing a total of 254,190m² office floor space (MTRC, 2007b). The last phase consisting of a luxury hotel and serviced apartment suites managed by Four Seasons Hotel and Resorts was completed in early 2005, and provides 102,250m² of floor space (Pitman, 1996a). Other associated developments include 1,340 car parking spaces, a transport interchange, extensive public and private open space and entertainment, recreational and community facilities (MTRC, 2007b).

Figure 10: Master Plan of Hong Kong Station



Source: MTRC (2007b)

Figure 11: Aerial Photo of Hong Kong Station



Source: Google (2009b)

Figure 12: Central Subway



Source: MTRC (2008)

Kowloon Station

Introduction

Kowloon Station serves as the second AEL stop on the way to the airport. The Kowloon Station development is situated on 13.54 hectares of reclaimed land in West Kowloon, where

the station itself has an area of six hectares (MTRC, 2007b). It is bounded by Austin Road and Jordan Road to the north and south, which is also adjacent to the Western Harbour Crossing and West Kowloon Expressway.

The railway station and tunnels are located in the west of the site, bounded by West Kowloon Expressway, which generates high traffic noise (Blackburn, 1999). The station was built with two underground levels providing separate platforms for the AEL and TCL. It has three above-ground levels of station concourses and retail development (Pitman, 1996a).

Passenger flow has been a priority for the designers, in order to maximise the efficiency of the station. As at Hong Kong Station, Kowloon Station provides in-town-check-in facilities (Pitman, 1997). All static functions (housing, offices and hotels) are accessible from the station platform while dynamic functions (transportation and commerce) are concentrated beneath the platform.

Planning and design context

The master plan was based upon a residential zone to the north and east of the site, where neighbouring traffic would be quietest. The south and west areas are occupied by hotels and offices, taking the maximum benefit from the best views over the harbour and the Lamma channel. A number of view corridors were identified, such as the 'no build zone' above the railway (Blackburn, 1999) (Figures 13 and 14).

Changes in the property market and the regulatory framework of Hong Kong have had a significant impact on the station design and construction. The master plan was continuously evolving, undergoing three significant revisions since first revised in mid-1995 (Blackburn, 1999; Pitman, 1996a).

The height of buildings was one of the concerns of the Town Planning Board. In the early days when the first master plan was developed, the development was constrained by the strict height restrictions of Kai Tak Airport. The height restrictions were amended after the airport was moved to Chek Lap Kok, allowing a more spacious layout and taller buildings to be developed. For instance in 1995, MTRC's original proposed plan was to build seven 20-storey buildings but it later revised its proposal to three 70-storey towers (Sito, 22 Jul 1995).

According to the Town Planning Board's requirements, the developers must provide public open space and transportation terminals to relieve the anticipated traffic problems. One feature of the plan is the use of the first floor to connect the district by a walkway system whilst vehicular traffic primarily uses ground level. The development was planned to be completed within 12 years (Blackburn, 1999; Sito, 26 Jul 1994).

According to the Government's plan as described by the Director of Lands, Bob Pope, planners had tried to redress some of the imbalances in the living environment, such as at Yau Ma Tei, Mongkok and Shamshuipo. These were often characterized as old and densely populated areas. The Government hoped the HKD 12bn reclamation project in West Kowloon would boost redevelopment in nearby areas. To facilitate redevelopment, the Land Development Corporation (LDC) announced 26 priority urban redevelopment projects near the West Kowloon Reclamation site in 1998 (Lyons, 21 Jan 1998).

Around 2,000 men were working on the Kowloon Station project at its peak between June and August 1997 (Anonymous, 1998).

Property development

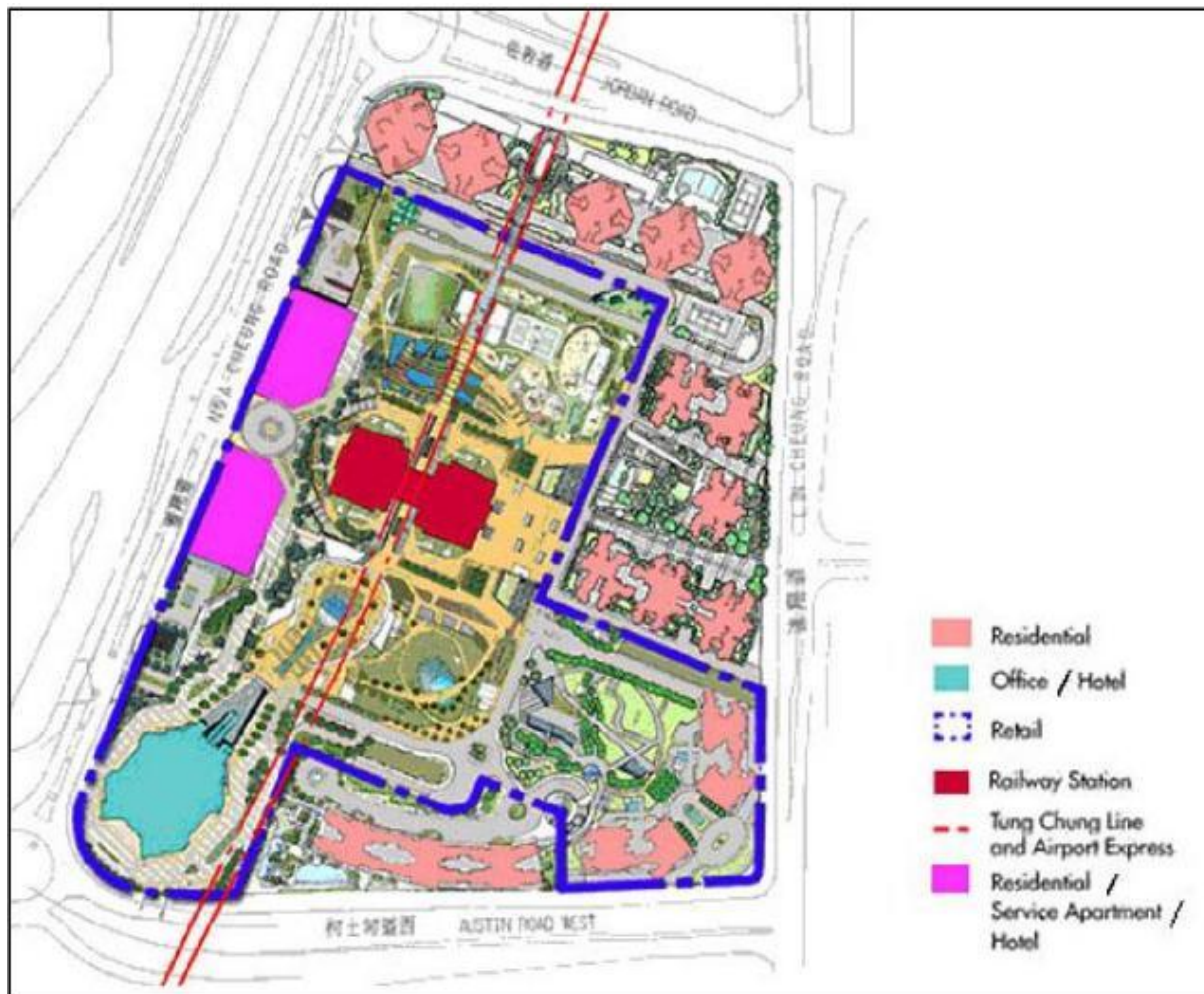
The Kowloon Station package offers 1.09million m² of fully integrated residential, office, retail

and hotel facilities (MTRC, 2007b).

Due to the sheer scale of the project, it is too large for any consortium to tackle as a single entity. Therefore, the development was divided into seven 'stand-alone' packages with vertical boundaries, to be built sequentially (MTRC, 1996a).

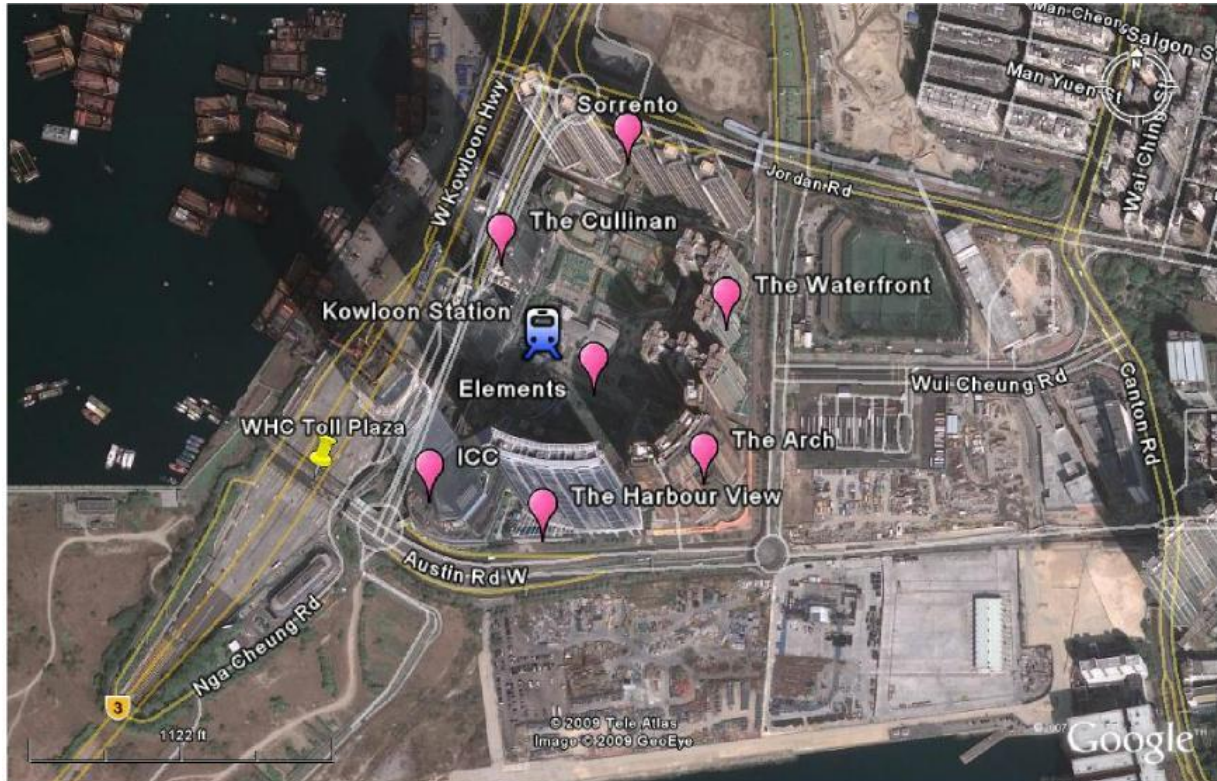
The 16 residential towers, namely The Waterfront, Sorrento, The Harbourside and The Arch, were the first to be built and occupied. These towers provide a total of 5,809 residential units. The shopping centre, Elements, with an area of 82,750m², opened in October 2007. The remaining development packages will be completed by 2010 (MTRC, 2007b). Taking full advantage of the relaxed height restrictions on buildings following the relocation of the airport, they include a 118-storey landmark office and hotel building, the International Commerce Centre, currently the tallest building in Hong Kong. This can accommodate approximately 231,778m² of offices, a deluxe hotel and an observation deck. It is still under construction. Other facilities on the site include a transport interchange, 5,400 car parking spaces, extensive public and private open space, recreational facilities and neighbourhood community facilities (MTRC, 2007b). The development aims to provide housing for about 91,000 people (Lyons, 21 Jan 1998).

Figure 13: Master plan of Kowloon Station



Source: MTRC (2007b)

Figure 14: Aerial Photo of Kowloon Station



Source: Google (2009b)

Olympic Station (formerly known as Tai Kok Tsui Station)

Introduction

Located on the northern part of West Kowloon Reclamation and south-west corner of Tai Kok Tsui, Olympic Station is the third stop to Tung Chung on the TCL (Figure 15). With a total area of 16.03 hectares, the station development was divided into four sites, aiming to generate a fully balanced new commercial and residential community and major transportation hub. The railway station is centrally positioned as the pedestrian circulation focal point of the four sites (MTRC, 1996a; MTRC, 2007b).

Planning and design context

Part of the planning and design plan of the Olympic Station development was to rejuvenate one of the oldest and most densely populated parts of Kowloon, the Tai Kok Tsui area. Many of the existing buildings in the vicinity dated back to the early post-war years. Therefore, apart from providing new commercial and residential environments, the master plan aimed to create recreational, community and sporting amenities (MTRC, 1996a). The scheduled development period for Olympic Station was seven years and it was able to meet the date (MTRC, 1996a; MTRC, 2008). About 450-500 people worked on the Olympic Station at its peak in 1996 (Anonymous, 1998). Apart from private sector development, the Government built a Public Sector Private Participation housing development, Charming Garden, in the north of the site (Lyons, 21 Jan 1998).

Property development

The four sites offer 667,652m² of residential, office and retail developments, and have been divided into three packages (Figure 15 and 16). There are 23 residential towers containing

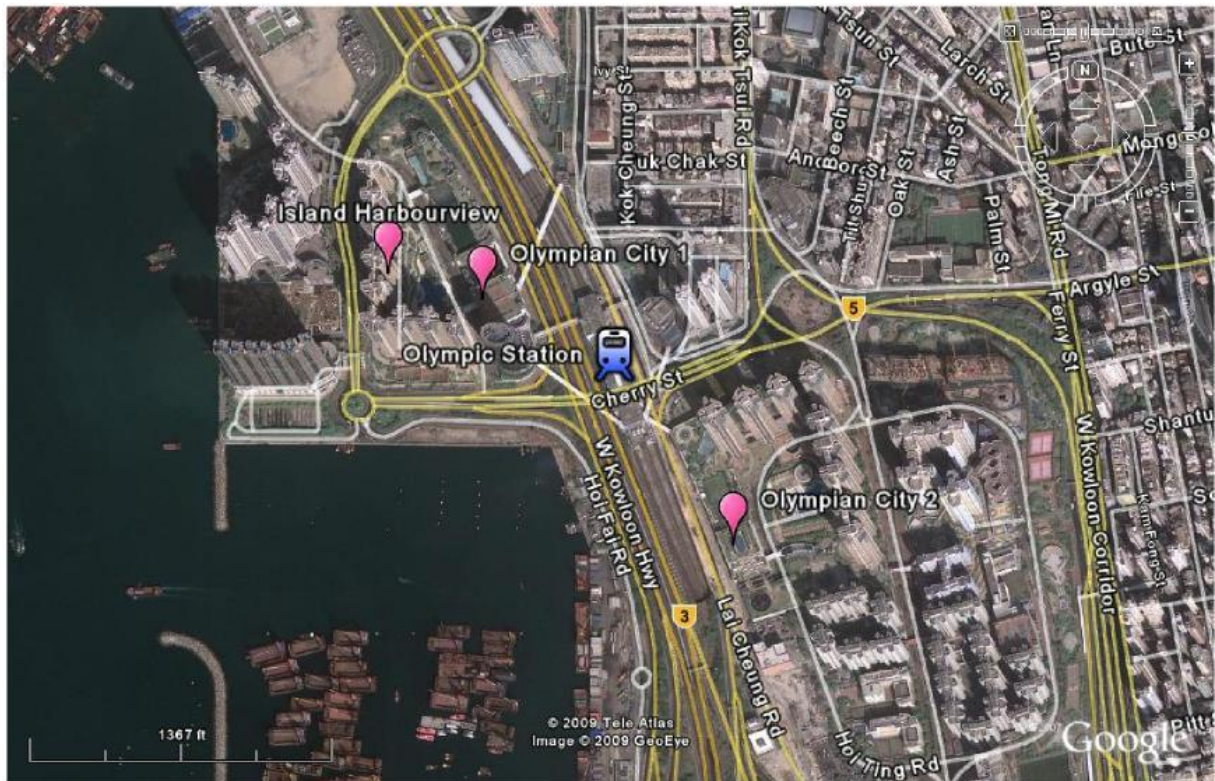
6,764 apartments, four office towers providing 111,000m² of floor space, 53,500m² of retail space (Olympian City One and Two), and a kindergarten of 1,300m². The development of the project took about seven years. The tender for Package 1 was awarded in March 1995. The consortium comprises Sino Land Co. Ltd., Bank of China Group Investment Ltd, Kerry Properties Ltd, China Overseas Land and Investment Ltd., and Capitaland Residential Ltd. (MTRC, 1996a; MTRC, 2007b; Porter, 28 Mar 1995).

Figure 15: Master plan of Olympic Station



Source: MTRC (2007b)

Figure 16: Aerial photo of Olympic Station



Source: Google (2009b)

Figure 17: Olympic Station



Source: MTRC (2008)

Tsing Yi Station

Introduction

This 5.4 hectare site is strategically located mid-way between the airport and Hong Kong Central. Access to Tsing Yi has been greatly improved with the completion of AEL and TCL. The journey between Hong Kong Station and Tsing Yi Station on the Airport Express takes only 12 minutes (MTRC, 1993a).

Planning and design context

The planning of Tsing Yi Station has faced the most restrictions. A dual-level bridge for the railways to cross the Rambler Channel had to be built across the property development site, which was planned to butt against it. Therefore, the planners had to abandon the common principle of using stratification to separate urban functions and to run the track on an upper level through the podium. The advantage of this design allowed two spacious concourses to break the spatial monotony of the shopping mall and fully integrated the station within the complex (Tiry, 2003). The project was planned to be completed within seven years (MTRC, 1996a).

About 2,000 workers were employed on the project at the peak of construction in late 1997 (Anonymous, 1998).

Property development

The 291,870m² development site includes the station, residential and retail facilities (Figures 18 and 19). It was divided into ten zones during the construction stages. Tsing Yi Station is embedded within the complex podium housing the largest shopping centre (with an area of 46,170m²), Maritime Square, in the district. It opened in early 1999. The property development above provides 12 residential towers containing 3,500 apartments. It was planned to accommodate a residential community of about 10,000 residents. Tierra Verde, the residential development above Tsing Yi Station, has been fully occupied since mid-2000. Similar to Hong Kong and Kowloon Stations, the development also provides a comprehensive public transport interchange, extensive recreational facilities and community facilities (MTRC, 2007b; Wong, 1998).

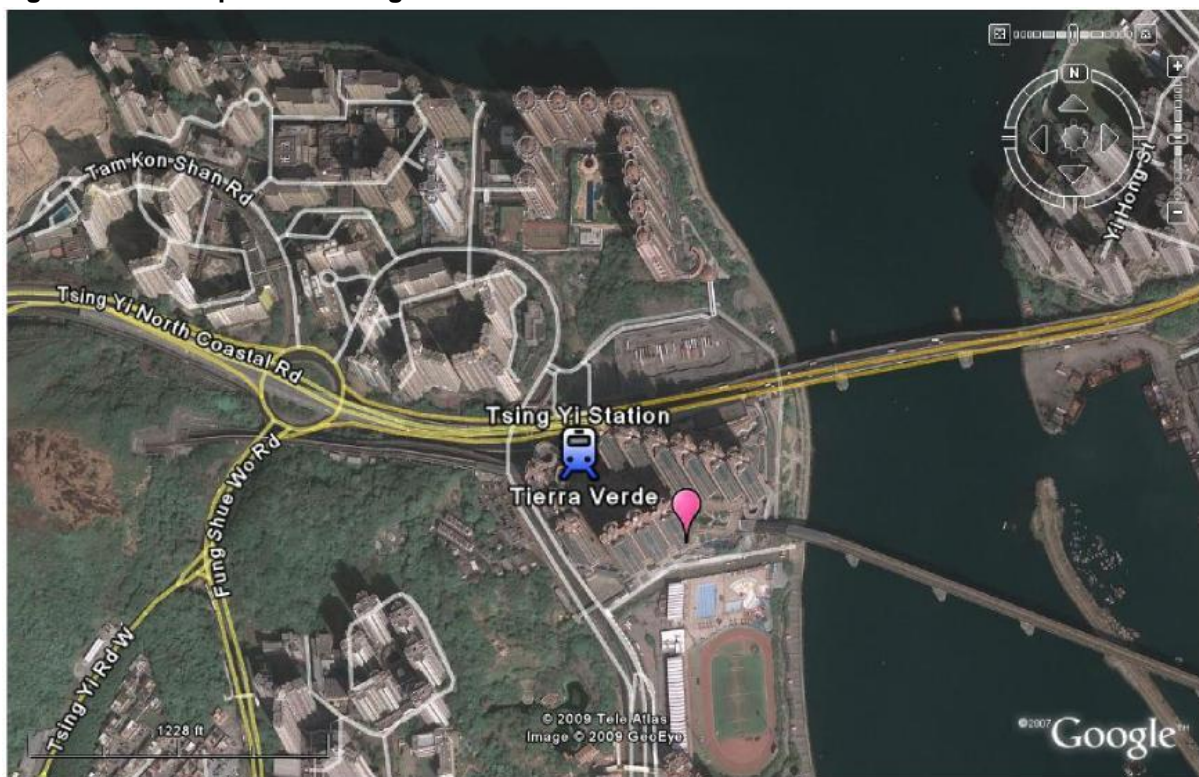
A consortium of developers comprising Cheung Kong (Holdings) Ltd, Hutchison Whampoa Ltd and CITIC Pacific Ltd was awarded the property development rights for Tsing Yi Station in September 1995. The development was completed on time (MTRC, 2007b; Sito, 26 Sept 1995).

Figure 18: Master plan of Tsing Yi Station



Source: MTRC (2007b)

Figure 19: Aerial photo of Tsing Yi Station



Source: Google (2009b)

Tung Chung Station

Introduction

Tung Chung Station is the gateway to the international airport, located adjacent to Chek Lap Kok. It is the last stop on the TCL, and the journey to Hong Kong Central only takes 23 minutes. The development has a total area of 21.7 hectares (MTRC, 2007b).

Planning and design context

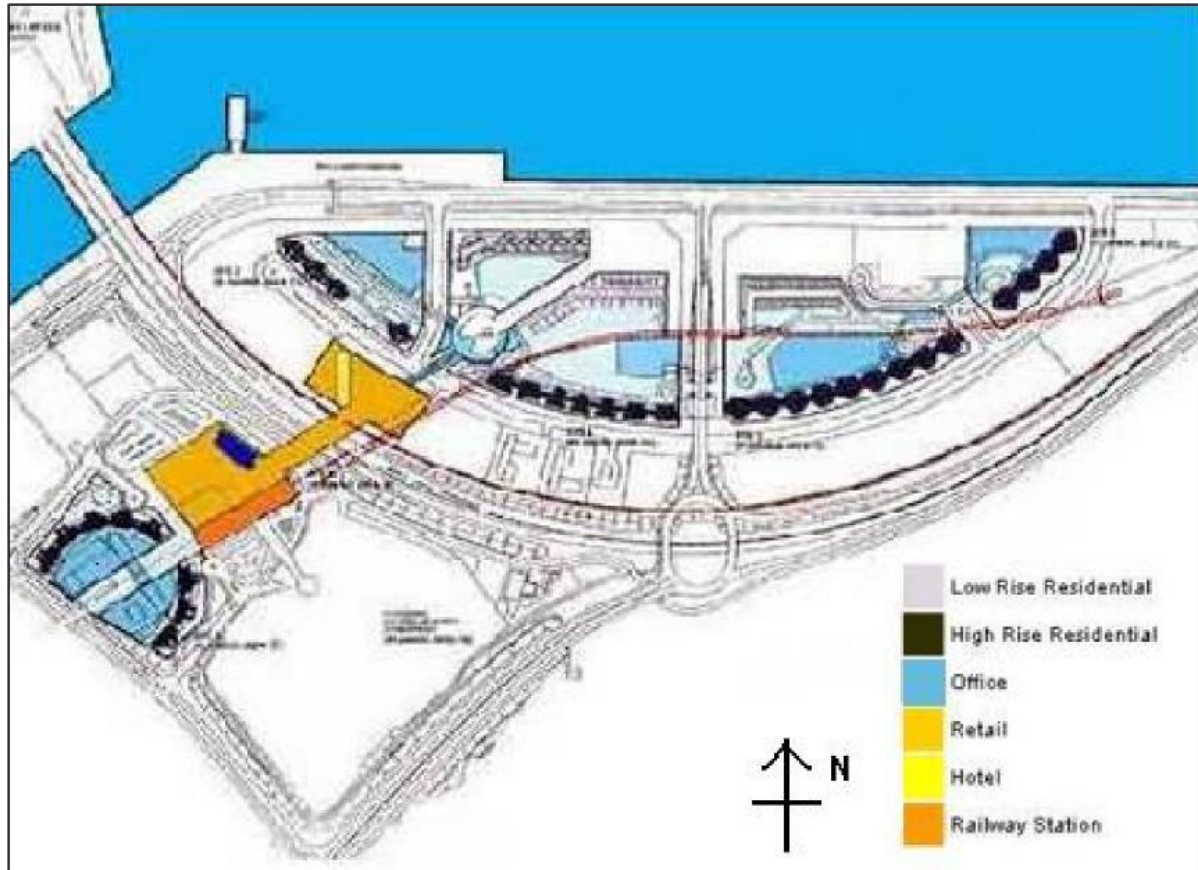
The planning and location of Tung Chung Station mainly depended on the North Lantau Development Study (Freeman Fox Maunsell, 1991a). In developing Tung Chung as a new integrated district, the Government and MTRC's urban planners agreed to create a district in which no residents live more than five minutes on foot from the station. In addition, the design of this new district favours horizontal distribution, abandoning the model of vertical stratification of urban functions. Urban functions are linked through large spaces reserved for pedestrian use. The development is characterized by its diversity of functions and open spaces.

Property development

As with the other stations, the development of Tung Chung Station is divided into three packages, with a total floor area of 1,028,910m² (Figures 20 and 21). This includes 32 high-rise and low-rise residential housing blocks, planned to accommodate 320,000 residents by 2011. The commercial complex comprises one office tower of approximately 15,000m², approximately 56,000m² of retail space and one hotel with 440 rooms. Given its close proximity to the airport, Tung Chung provides a base for tourists, business travelers and aircrew requiring hotel facilities (MTRC, 2007b; Tiry, 2003). The project was programmed to be completed in eight years, but took ten years to complete (MTRC, 1996a; MTRC, 2008).

According to Transport Branch projections, the Tung Chung population would generate 30,000 daily trips on TCL and another 115,000 daily trips would be generated by Tung Chung and airport jobs (Wong, 14 Sept 1992).

Figure 20: Master plan of Tung Chung Station



Source: MTRC, 2007b

Figure 21: Aerial photo of Tung Chung Station



Source: Google (2009b)

Airport Station

Introduction

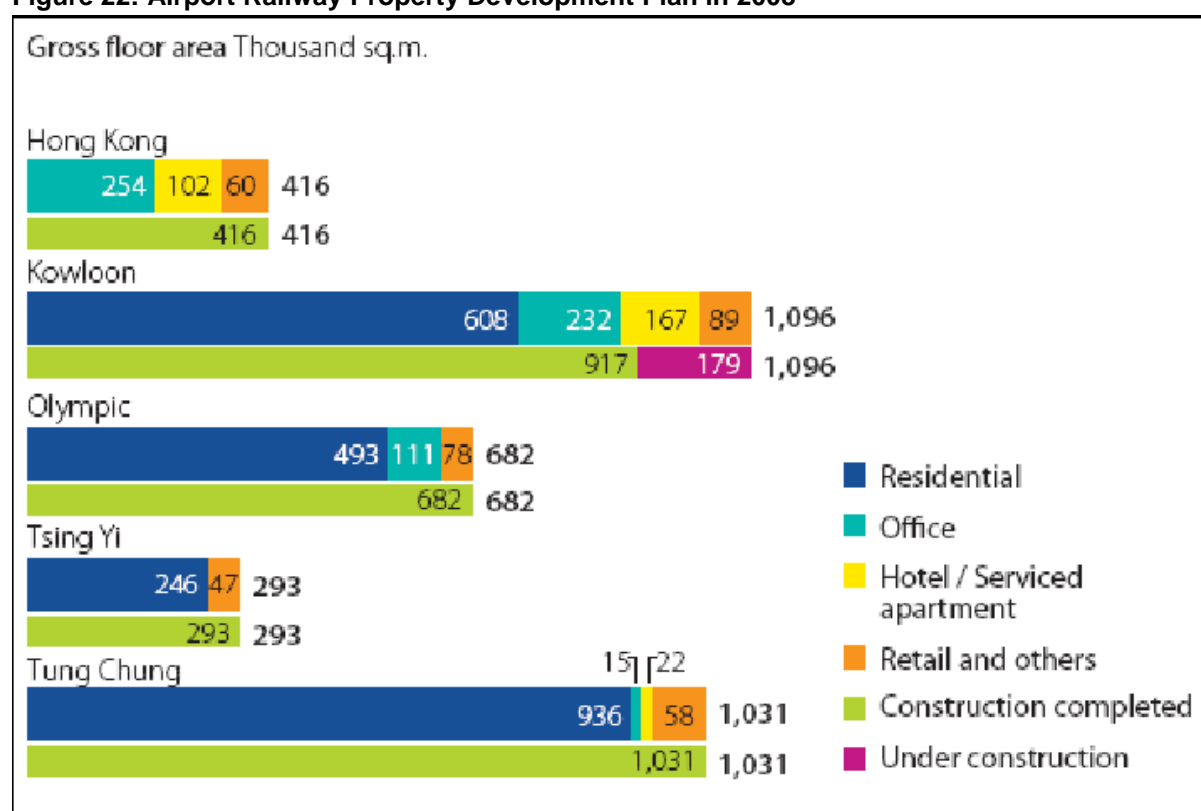
This station is located inside the Ground Transportation Centre, adjacent to the airport's passenger terminal building. The arrivals platform of the Airport Express is at the same level as the arrivals hall, whereas the departures platform is at approximately the same level as the departures hall (Pitman, 1996a).

Planning and design context

The design of the station was part of the Airport Master Plan Study (Freeman Fox Maunsell, 1991a). The design and construction work for the station structure was under the contract for the Ground Transportation Centre, awarded by Airport Authority, whereas the environs of the station were constructed on behalf of the MTRC. The building of the structure started in April 1995 (Anonymous, 1998).

Figure 22 and Table 2 summarize the details of the Airport Railway property development.

Figure 22: Airport Railway Property Development Plan in 2008



Source: MTRC (2008)

Table 2: Details of Airport Railway Property Development

	Site Area (Hectares)	Residential		Office		Retail		HOTEL / SERVICED APARTMENTS		Total Gross Floor Area	No. of Development Packages
		Gross Floor Area	No. of Units	Gross Floor Area	No. of Towers	Gross Floor Area	No. of ShoppingC entres	Gross Floor Area	No. of Rooms		
Hong Kong	5.71	-	-	254,190	2	59,460	1	102,250	918	415,900	1
Kowloon	13.54	608,011	5,809	231,778	1	82,750	1	167,472	1,565	1,090,011	7
Olympic	16.03	493,152	6,764	111,000	4	63,500	2			667,652	3
Tsing Yi	5.40	245,700	3,500			46,170	1			291,870	1
Tung Chung	21.70	935,910	12,400	15,000	1	56,000	1	22,000	440	1,028,910	3
TOTAL	62.38	2,282,773	28,473	611,968	8	307,880	6	291,722	2,923	3,494,343	15

* All figures of gross floor areas are in m²
Source: MTRC (2007b)

Table 3: Full list of Airport Railway Property Development Developers and Dates

Location	Developers	Actual or expected completion date/ Contracts awarded date/ Awarded price
<u>Hong Kong Station</u> (International Finance Centre, IFC Mall, Four Seasons Hotel/ Four Seasons Place)	Sun Hung Kai Properties Ltd. Henderson Land Development Co. Ltd. The Hong Kong & China Gas Co. Ltd	<ul style="list-style-type: none"> Completed by phases from 1998-2005 Awarded in March 1996 (MTRC 1996b) HKD 40bn (Ko, 30 Mar 1996)
<u>Kowloon Station</u> Package One (The Waterfront) Package Two (Sorrento) Package Three (The Arch) Package Four (the Harbourside) Package Five, Six and Seven (Elements, International Commerce Centre, The Cullinan, W Hong Kong, The Harbourview Place)	Wing Tai Holdings Ltd. Temasek Holdings (Pte) Ltd. Singapore Land Ltd. Keppel Land Ltd. Lai Sun Development Co. Ltd. Worldwide Investment Co. (Bermuda) Ltd. The Wharf (Holdings) Ltd. Wheelock and Company Ltd. Wheelock Properties Ltd. Realty Development Corporation Ltd. Harbour Centre Development Ltd. Sun Hung Kai Properties Ltd. Hang Lung Properties Ltd. Sun Hung Kai Properties Ltd.	<ul style="list-style-type: none"> Completed in 2000 Awarded in February 1996 (MTRC 1996b) HKD 7.7bn (Reuters News, 16 Feb 1996) <ul style="list-style-type: none"> Completed phases from 2002-2003 Awarded in July 1997 (Reuters News, 24 Oct 1997) <ul style="list-style-type: none"> Completed in 2005 Awarded in January 2000 (MTRC 1999) HKD 5bn (Sito, 25 Jan 2000) <ul style="list-style-type: none"> Completed in 2003 Awarded in April 1999 (MTRC 1999) <ul style="list-style-type: none"> By phases from 2006-2010

Location	Developers	Actual or expected completion date/ Contracts awarded date/ Awarded price
<u>Olympic Station</u> Package One (Island Harbourview, HSBC Centre, Bank of China Centre and Olympic City One) Package Two (Park Avenue, Central Park and Olympic City Two) Package Three (Harbour Green)	Sino Land Co. Ltd. Sino Land Co. Ltd. Sun Hung Kai Properties Ltd.	<ul style="list-style-type: none"> Completed in 2000 Awarded in March 1995 (Porter, 28 Mar 1995) <ul style="list-style-type: none"> Completed in 2001 Awarded in August 1996 (MTRC 1996b) HKD 12bn (Sito, 6 Aug 1996) <ul style="list-style-type: none"> Completed in 2006 Awarded in September 1997 (MTRC 1997) HKD 3bn (Lyons, 28 Aug 1997)
<u>Tsing Yi Station</u> (Tierra Verde and Maritime Square)	Cheung Kong (Holdings) Ltd. Hutchison Whampoa Ltd. CITIC Pacific	<ul style="list-style-type: none"> Completed in 1999 Awarded in September 1995 (Sito, 26 Sept 1995) HKD 7bn (Sito, 26 Sept 1995)
<u>Tung Chung Station</u> Package One (Tung Chung Crescent, Citygate, Novotel Citygate and Seaview Crescent) Package Two (Coastal Skyline) Package Three (Caribbean Coast)	Hang Lung Group Ltd. Henderson Land Development Co. Ltd. New World Development Co. Ltd. Sun Hung Kai Properties Ltd. Swire Properties Ltd. HKR International Ltd. Hong Leong Holdings Ltd. Recosia Pte Ltd. Cheung Kong (Holdings) Ltd. Hutchison Whampoa Ltd.	<ul style="list-style-type: none"> Completed by phases from 1999-2005 Awarded in March 1995 (Porter, 18 Mar 1995) <ul style="list-style-type: none"> Completed by phases from 2002-2008 Awarded in November 1996 (MTRC 1996b) HKD 9bn (Reuters News, 8 Nov 1996) <ul style="list-style-type: none"> Completed by phases from 2002-2008 Awarded in February 1997 (MTRC 1997) HKD 11bn (Sito, 3 Dec 1996)

Source: MTRC (2008)

Project costs

Estimated cost

At the very initial planning stage of Airport Railway recommended in PADS (Lands and Works Branch, 1989), the costs of AEL and TCL were estimated and are shown in Table 4. Based on March 1991 prices, building only TCL would cost HKD 16bn, while building the entire Airport Railway would cost HKD 22.5bn (Lau & Cheung, 8 Apr 1992). Therefore, it was concluded that building both would be more economically viable.

Table 4: Estimated costs of Airport Railway in PADS

	Capital cost (in HKD bn)	Annual operating costs (in HKD m)
Airport Express Line	5.75	56
Tung Chung Line	7.96	66
Both Lines	8.98	132

Source: Lands and Works Branch (1989)

The estimated costs for the Airport Railway have been forecast several times since 1989. Table 5 compares estimated and actual costs over time. The main reasons for the cost escalation from HKD 12bn to HKD 22bn (March 1991 prices) were modifications of the rail link and the inclusion of contracts under other ACP projects, including building tracks on the Lantau Fixed Crossing, relocating the airport railway depot to Siu Ho Wan, works at North Lantau Expressway and Route 3. There would be more tracks and more spacious station platforms (Wong, 13 Jan 1992; Lau & Cheung, 27 May 1992). Consequently, the Government revealed that the actual expenditure on the Airport Railway would be HKD 33.5bn by the time of its completion in 1997, based on the estimate of HKD 22.1bn at March 1991 prices (Chen & Wong, 13 Jun 1992).

Table 5: Whole project costs of the Airport Railway Project

Price (in HKD bn)	Prices at	Source
<i>Estimated price:</i>		
• 20	• Dec 1989	• Stoner, 22 Dec 1989
• 11.14 ¹	• Jan 1990	• Freeman Fox Maunsell, 1991a
• 14-15	• Dec 1990	• Wong, 12 Dec 1990
• 12.1	• Mar 1991	• Ko, 12 Jul 1991
• 22 (excluding financing charge)	• Mar 1991 ²	• MTRC, 1993a
• 33.5 (based on price at Mar 1991)	• 1997	• Chen & Wong, 13 Jun 1992; SCMP, 30 Sept 1992
<i>Actual price:</i>		
• 35.1 ³		• MTRC 1998
• 48 ⁴		• Budge Reid, 1999

¹ The estimate includes construction, electrical and mechanical, depot and rolling stock

² Based on the project scope as defined in negotiations in December 1991

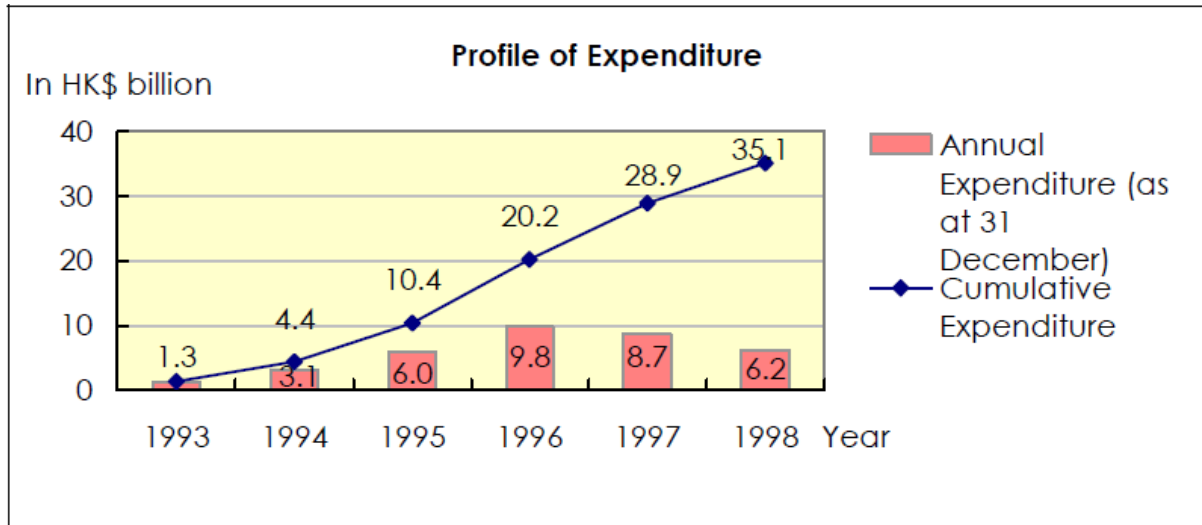
³ Including railway works, design, supervision and all corporate on-costs

⁴ Including the associated development foundations and infrastructure

Actual cost

MTRC managed to complete the project within the original budget of HKD 35.1bn. According to the 1997 MTRC Annual Report, 82% of the total budget was spent up to the end of 1997. Figure 23 shows MTRC's expenditure on the project from 1993 to 1998 (MTRC, 1997).

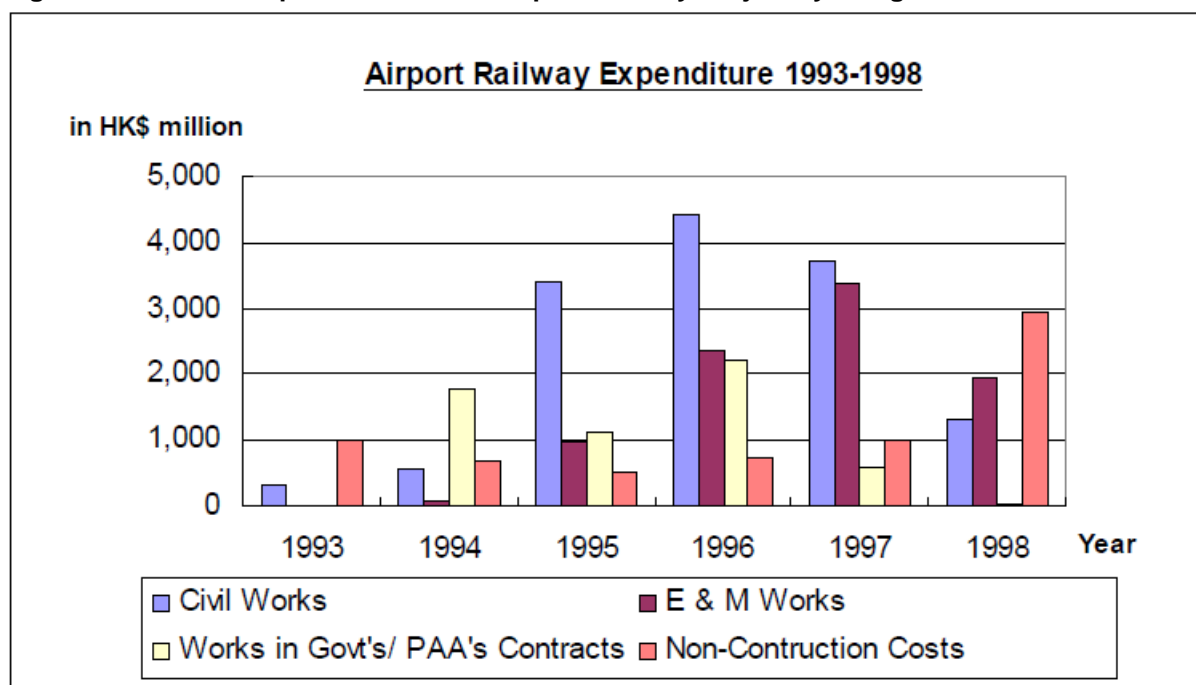
Figure 23: MTRC's Annual Expenditure on the Airport Railway Project



Source: MTRC (1998)

Figure 24 details the distribution of money spent in each year, consisting of construction costs and non-construction costs. Construction costs include civil works, electrical and mechanical works (plant and equipment), and works in government and/or PAA contracts. Non-construction costs include rental of work sites, consultant fees, and corporation and financing costs (site investigation costs, staff costs and other general expenses, and interest on loans). Figure 24 suggests the spending on Government and PAA works were much higher than that on civil works during 1994. This could possibly be explained by the delay of the secured financing agreement, which was not signed until November 1994. Consequently, only 'embedded' works in Government or PAA contracts were started before 1994, whilst the Airport Railway's civil works could only commence after 1994. Therefore, Figure 24 indicates a sudden growth in civil works' expenditure in 1995 and concludes that the construction of Airport Railway was in full swing between 1996 and 1997 as most civil works' spending was used during this period.

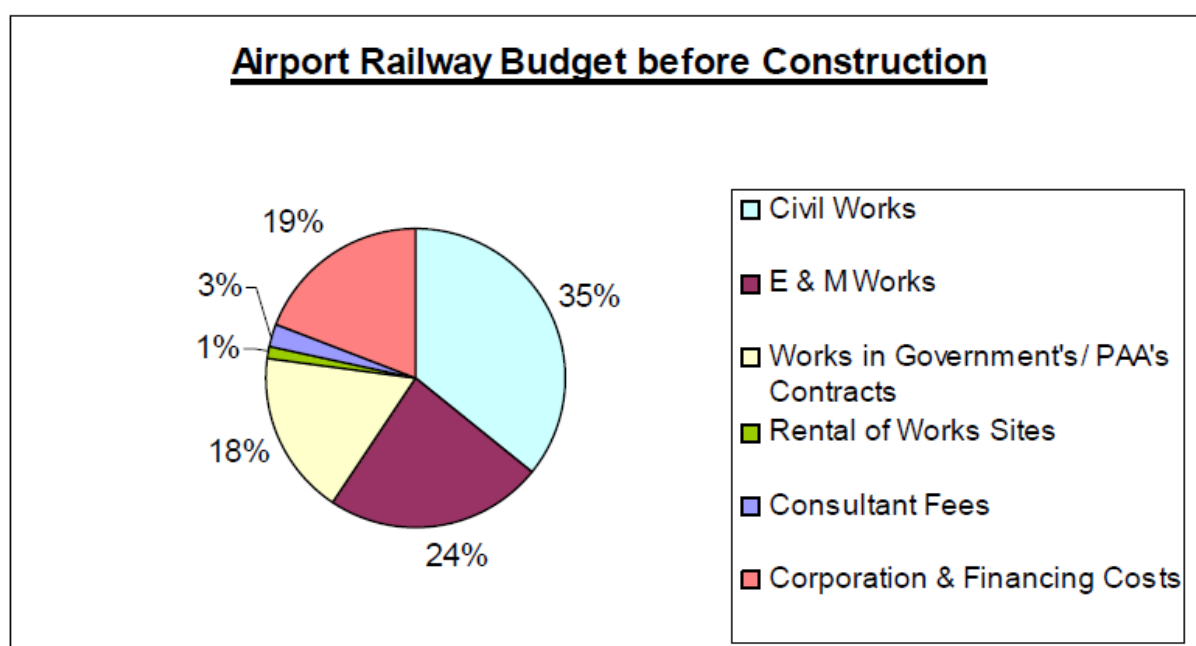
Figure 24: MTRC's Expenditure on the Airport Railway Project by categories



Source: MTRC (1994, 1995b, 1996b, 1997 & 1998)

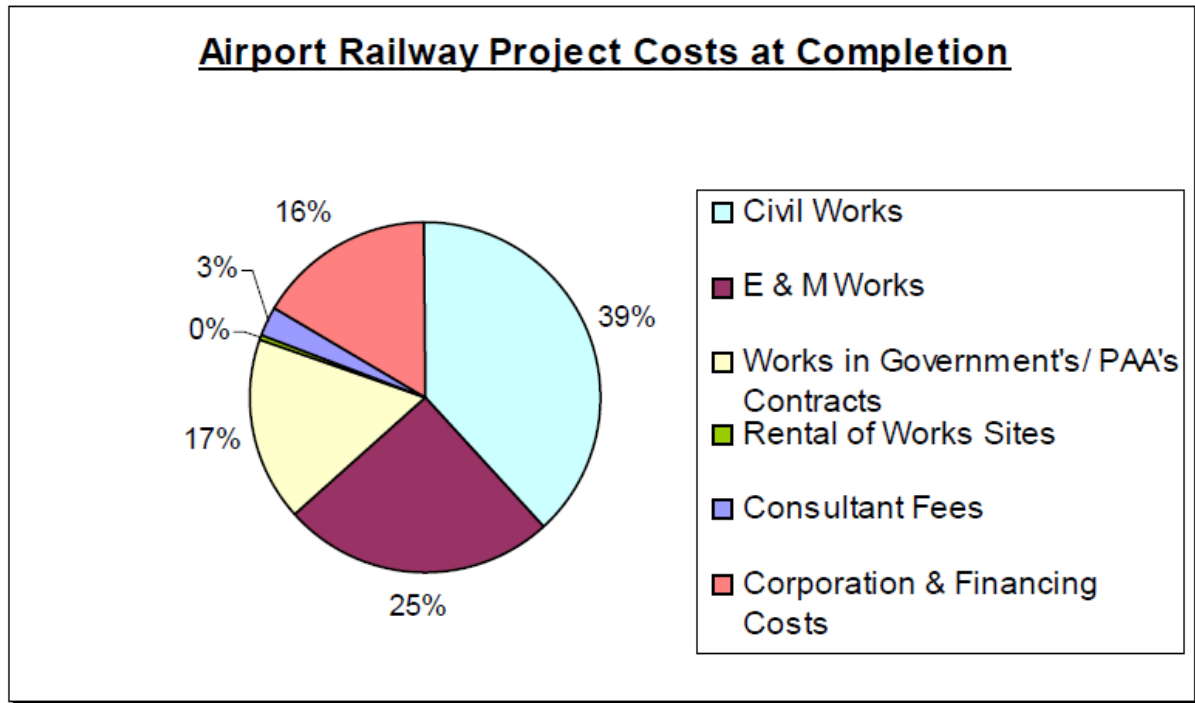
Figures 25-27 compare the Airport Railway budget and actual expenditure at completion. As mentioned above, MTRC managed to build the Airport Railway within the budgeted HKD 35.1bn. Civil works accounted for the largest share in both the budgeted and actual expenditure, 35% (HKD 12.6bn) and 39% (HKD 13.4bn) respectively. Spending on the rest of the works was slightly below budgeted costs except for E&M works.

Figure 25: Airport Railway budget



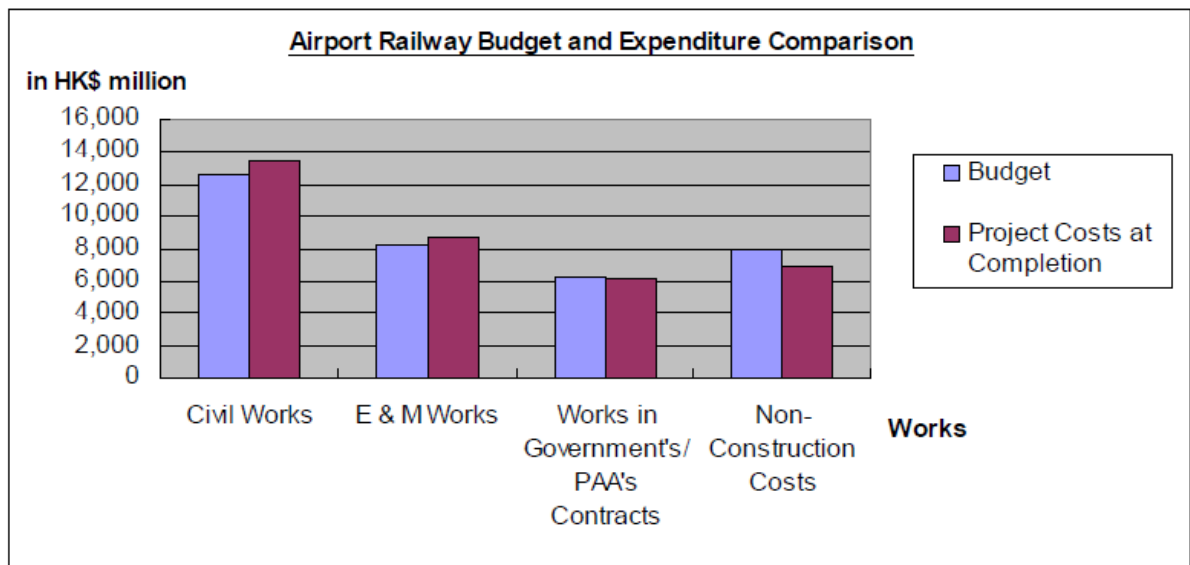
Source: MTRC (1994, 1995b, 1996b, 1997 & 1998)

Figure 26: Airport Railway project costs at completion



Source: MTRC (1994, 1995b, 1996b, 1997 & 1998)

Figure 27: Comparison of Airport Railway budget and actual expenditure



Source: MTRC (1994, 1995b, 1996b, 1997 & 1998)

Project programme

The Airport Railway project obtained official approval in November 1994 after all the uncertainties and changes (refer to 'Project key issues'). Initially, the Airport Railway project was planned to open in January 1997 in conjunction with the opening of the new airport (Freeman Fox Maunsell, 1991a). However, due to external factors (particularly the political and financial negotiations between Governments), the airport programme was delayed to 1998. The construction programme for the AEL project remained at 43 months throughout these changes. It opened in July 1998 (Budge Reid, 1999; MTRC, 1998). (Table 6)

The planning, design and construction of the Airport Railway took over eight years , employing around 13,200 people at its peak in the development of two rail services, a depot and six stations (MTRC, 1998).

Table 6: Construction dates for the Airport Railway

	Forecast	Actual
Construction start	1992 (Freeman Fox Maunsell, 1991a)	Various dates depending on different projects
Construction completion	<ul style="list-style-type: none"> • Jan 1997 (Freeman Fox Maunsell, 1991a) • Mid-1997 (LegCo, 1994d) • June 1998 (Szeto, 12 Oct 1996) 	TCL: June 1998 (MTRC, 1998) AEL: July 1998 (MTRC, 1998)

Main engineering features

Engineering

The track

- 34km airport railway (Crighton and Budge-Reid, 1998);
- 35.5km including Asia World Expo (MTRC, 2007a);
- AEL and TCL share the same tracks for 90% of the total railway (Wong, 1998).

The train

- Trains operating at a maximum operating speed of 135km/hr (NAPCO, 1998);
- The Airport Express service started with seven cars with each car has 64 seats (NAPCO, 1998);
- AEL takes 24 minutes running between the airport and Hong Kong Station (MTRC, 2007a);
- The TCL service initially operated with seven cars, which are able to carry 312 passengers (NAPCO, 1998).

Construction

In general, the main difficulties with construction have been the tight programming, planning and access, and the interface with other ACP contracts.

Hong Kong Station

The project employed a top-down construction approach. After the diaphragm wall was constructed with the piling in place and the ground floor slab cast, the contractor went ahead with the top-down excavation beneath the slab. Superstructure construction commenced at the same time.

The Hong Kong Station project was completed in just 36 months (Wong, 1998).

Central Subway

The subway has a capacity of 40,000 passengers during peak hours (Pitman, 1996a). The 'cut and cover' method was used to construct the subway from the road surface. The relatively narrow adits beneath Exchange Square were constructed by the tunneling method,

whereas open cut construction was used for the Douglas Street entrance (Pitman, 1996a).

Central reclamation

Central reclamation was the prerequisite to foundation work for the Hong Kong Station project. The reclamation comprised construction of a 1.2km long seawall and reclamation of 20 hectares in which 1.2million m³ of mud was dredged and 4.2million m³ of sand placed (Mackie, 1997).

A large proportion of this had to be completed before station work could commence. Whenever reclaimed land became available it was handed over to the main contractor (Aoki Corporation) of Hong Kong Station (Griffiths, 1996).

Western Immersed Tube Tunnel

This is a twin-track immersed tube tunnel under Victoria Harbour. The 1.26km long tunnel comprises ten precast reinforced concrete units. The alignment of the immersed tube is curved and hence most of the units are uniquely curved. The concrete tunnel units were constructed inside the casting basin in Shek O Quarry. Each is sealed with a steel bulkhead to make it watertight, and the casting basin was flooded with sea water. The tunnel units were then floated out and subsequently immersed into position on the floor of Victoria Harbour (Pitman, 1996a).

Kowloon Station

The station itself was constructed using the conventional 'bottom up' method. Building the foundation of Kowloon Station required extensive piled foundation works to support the station and property development. The foundation required installation of 120,000 tonnes of reinforced concrete piles to fill the holes, which took about 20 months to complete. A world record was claimed for one pile which went to a depth of 106m, apparently not an easy operation (Pitman, 1996a; Pitman, 1997).

West Kowloon reclamation

This is the land to the Kowloon and Tai Kok Tsui Stations and their property development.

Rambler Channel Bridge

This 1.068km long viaduct carries four railway tracks on two levels from Tsing Yi Station over the Rambler Channel and adjacent Typhoon Shelter into Kwai Chung Park (Pitman, 1996a).

Tung Chung Station

The station needed about 1.3km of tunnel, 5million m³ of reclamation and 950m of seawall, built using 77,000 m³ of concrete and 8,900 tonnes of reinforcing bars (Wallis, 23 Nov 1994).

Chek Lap Kok Airport Station

The two-level station, approximately 70m from the terminal building, is connected by footbridges. Sir Norman Foster Architects were contracted to design the new railway station (Pitman, 1996a).

Siu Ho Wan Depot

This was built on 30 hectares of reclaimed land on Northern Lantau (SCMP, 16 Dec 1993c).

Main contracts and contractors

According to the MOU, the British must consult the Chinese before HK Government can grant major airport-related franchises or contracts (HK Government, 1991).

MTRC was responsible for managing contracts, and split various components into separate contractual packages. Before any financial commitments were made, advance works were incorporated into various Government ACP contracts. These works included cut and cover tunnels, formation works in West Kowloon Expressway, elevated structures in Route 3 contracts, the Railway right-of-way on the Lantau Link bridges, and the reclamation of the Railway formation and depot under North Lantau Expressway contracts (MTRC, 1994).

Before any financing plans were agreed between the two Governments, MTRC adopted a radical approach with its contractors and suppliers. This allowed MTRC to continue inviting tenders for contracts as it would normally do, but contracts would only be awarded once the political and financial negotiations were resolved. Instead of awarding contracts immediately, MTRC sent 'option letters' asking the selected contractor to hold its price for a period of up to 12 months. In return for being selected as the contractor, MTRC would take the risk of inflation and currency movements during the waiting period (Wallis, 7 Feb 1994).

A list of contractors for the Airport Railway is given in Table 7.

Table 7: Main Civil Engineering Contractors of Airport Railway (including parts of TCL)

Contract No.	Contract Title	Contractor	Award Price (HKD m) (money of the day)	Award Date
501	Hong Kong Station and Tunnels (Design)	Ove Arup & Associates		Jun 1995
501	Hong Kong Station and Tunnels	Aoki Corporation	3,133	
501A	Central Subway	Kier-Sun Fook Kong Joint Venture	711	Dec 1994
UA 11	Central Reclamation project	Dragages-Penta-Bachy Joint Venture		Sept 1993
502	Western Immersed Tube Tunnel	Kumagai Tarmac Joint Venture	598.88	Jul 1994
503B	Kowloon South Tunnels and Ancillary Buildings	Amec International Construction - Shui On - China Fujian Corporation for ITEC Joint Venture	402	Nov 1994
503C	Kowloon Station	Kumagai Gumi – Entrecanales - Cubiertas Joint Venture	1,964	Nov 1994
-	Kowloon to Tai Kok Tsui Tunnels	Entrusted to government (West Kowloon Expressway project)		
505	Olympic (Tai Kok Tsui) Station	John Laing – Hip Hing Joint Venture	377	Dec 1994
-	Tai Kok Tsui to Lai Chi Kok Formation	John Laing – Hip Hing Joint Venture		
-	Kwai Chung Viaducts	Entrusted to government (Route 3)		
508	Lai King Station and Tunnels	Maeda Corporation	754	Dec 1994
509	Kwai Chung Park Viaducts	GTM International – Wan Hin – CFE Joint Venture	268	Nov 1994
510	Rambler Channel Bridge	Dragages – Penta Joint Venture	480	Nov 1994
511C	Tsing Yi Station	Maeda – Kumagai Joint Venture	1,140	Dec 1994
512	Tsing Yi Tunnels and Viaducts	Downer – Zublin Joint Venture	430	Dec 1994
-	Lantau Fixed Crossing	Part of Lantau Fixed Crossing project	-	
514	East Lantau Tunnels	Downer – Zublin Joint Venture	220	Jan 1995
-	Lantau Expressway	Entrusted to the government		
516	Tung Chung Station and Tunnels	Aoki Corporation	650	Nov 1994
	Chek Lap Kok Station Works	Entrusted to the PAA		
518	Siu Ho Wan Depot Phase 1	Zen Pacific – Shui On Joint Venture	835	Jan 1995
520	Trackwork	Gammon – Balfour Beatty Joint Venture	1,189	Mar 1995
544-580	Electrical & Mechanical Works (including rolling stock, signaling, environmental control systems, power supply, lifts, communications, escalators, automatic fair collection equipment etc.)	Adtranz-Cap Joint Venture (rolling stock)	4,600 approx.	Nov 1994 – Sep 1995

Source: NAPCO (1998b); Anonymous (1995a)

Major civil engineering components

Details are shown in Table 8.

Table 8: Airport Railway Key Facts and Figures

Airport Express	Total track length	34km
	Tunnel distance	8km
	Elevated structures distance	6km
	Ground level distance	20km
	Design speed	135 km/h
	Train capacity	64 persons per car
	Hong Kong station to Airport station	23 minutes
	Operational hours	05:50 to 01:15 daily
	Train frequency from HK station to the airport	12 minutes
Western Immersed Tube Tunnel (Anonymous, 1995a)	Length	1.260km
	10 tunnel units	126m long X 7.7m high X 12.4m wide (each)
	Weight	11,000 tonnes

Source: MTRC (1993a, 1997)

D PROJECT TIMELINE

Project timeline

Table 9 and Figure 28 summarise the key decisions and events of the Airport Railway project in relation to its planning, implementation and operation.

Table 9: Key decisions/ events of Airport Railway

Year	Month	Type of decision/ event	Key decision/event
1989	Oct	Project Initiation	<ul style="list-style-type: none"> The HK Government announced in its policy address that Kai Tak Airport would be moved to Chek Lap Kok (Airport Authority, 2009b).
	Nov	Project Initiation	<ul style="list-style-type: none"> The Secretary for Transport, Mr Michael Leung Man-kin, announced that an eight-month Airport Railway Feasibility Study would be launched in February 1990 (SCMP, 9 Nov 1989; HKS, 22 Dec 1989).
	Dec	Project Initiation Project Initiation	<ul style="list-style-type: none"> The Port and Airport Development Strategy (PADS) was published (Lands and Works Branch, 1989). MTRC was invited by the Government to participate in the construction of the Airport Railway, largely because it had considerable experience in building and managing large scale rail projects. MTRC declared its interest in assisting the feasibility study. It would design, construct, finance and operate the Airport Railway if the feasibility study proved satisfactory. In contrast, KCRC was not asked to participate in the project (HKS, 22 Dec 1989). The estimated cost of the Airport Railway was between HKD 15bn and HKD 20bn; the estimated maximum patronage was between 35,000 and 40,000 passengers a day. It was seen as a very high-risk project with a low return (Stoner, 22 Dec 1989).
1990	Jan	Project Initiation	<ul style="list-style-type: none"> 'Moving into the 21st Century - the White Paper on Transport Policy' confirmed that the Airport Railway was one of the recommended railway projects and that it was planned for completion by 1997 when the first runway of the airport was to open (Transport Branch, 1990).
	Jan	Project Initiation	<ul style="list-style-type: none"> According to Government estimates, the HKD 127bn ACP projects could drain as much as three quarters of HK's reserves. Even if the private sector funded 60% of the final costs, it was estimated that 10-20% of the territory's reserves would be drained. China expressed concerns over the serious depletion of HK's reserves (Wong, 4 Jan 1990).
	Mar	Project Initiation	<ul style="list-style-type: none"> MTRC selected civil engineering consultants Acer Far East and Maunsell Ltd as partners in preparing the feasibility studies (Stoner, 15 July 1990).
	Apr	Project Initiation Project Initiation – Project Cost	<ul style="list-style-type: none"> On 4 April, the Provisional Airport Authority (PAA) was established under the Provisional Airport Authority Ordinance with a mandate to plan, design and construct Hong Kong's new airport (Airport Authority, 2009b). MTRC revealed that in its financial study the cost of the Airport Railway was estimated at HKD 15-20bn. The project might not be commercially viable due to high construction costs (Lee & Allen, 21 Aug 1990).

Year	Month	Type of decision/event	Key decision/event
1990	May	Project Initiation Project Initiation	<ul style="list-style-type: none"> MTRC was expected to be granted property development rights as an inducement for construction of the airport railway (Stoner, 20 May 1990). Kleinwort Benson was appointed as financial consultant to the Government for the railway study, which was scheduled for completion in July 1990 (Stoner, 20 May 1990).
	Jun	Line Haul & Hubs	<ul style="list-style-type: none"> The Government was considering locating the station for the Airport Railway on Hong Kong Island at the Star Ferry Terminal after the completion of Central and Wanchai reclamation. The reclamation had to be finished by 1993 so that the Airport Railway and station could be built on time (Becker, 30 Jun 1990).
	Jul	Project Initiation	<ul style="list-style-type: none"> The first Sino-HK discussions on HK's infrastructure projects were held. Francis Maude, the British minister responsible for HK affairs, led a four-day mission to Beijing. The Chinese Prime Minister, Li Peng, accepted the new airport plan but was worried about the huge cost (Wong & Lee, 28 Jul 1990).
1990	Aug	Project Initiation Project Initiation	<ul style="list-style-type: none"> The Interim Report of Airport Railway Feasibility Study was published in August 1990 (Freeman Fox Maunsell, 1991a). The Airport Railway project might be shelved if the financial study concluded it was not financially viable. Both the Government and MTRC were yet to make a decision (Lee & Allen, 21 Aug 1990).
	Sept	Project Initiation Financing Associated Development-C&W Reclamation	<ul style="list-style-type: none"> At a meeting on 6 September, it was decided that AEL stations should make provision for ten-car trains, i.e. with platform lengths of 240m (Freeman Fox Maunsell, 1991a). The Government and MTRC discussed the terms of the Airport Railway, negotiations were started but no loans had been fixed; the chief secretary claimed that MTRC would have to seek USD 1.5bn (HKD 11.64bn) in loans between 1990 and 1997 (Ocampo, 11 Sept 1990). The Central and Wanchai Reclamation project might have to be delayed due to lack of funding, and the decision to proceed with the Airport Railway project was not made. Also, the financial projections for the railway were not yet ready. The commencement of the reclamation project depended on whether the terminal of the Airport Railway was to be built (Leung, 15 Sept 1990).
	Oct	Project Initiation Project Initiation	<ul style="list-style-type: none"> The Draft Final Report of Airport Railway Feasibility Study was published (Freeman Fox Maunsell, 1991a). A confidential report, submitted to the Chinese Government in October 1990, was released. It confirmed that Hong Kong's fiscal reserves would drop from currently HKD 73bn in 1989-90 to HKD 22bn in 1994-95 as the major airport works started, and then would further decline to an estimated HKD 5bn in 1997. The Government estimate for the construction of the rail link was now HKD 20bn, an increase of HKD 6bn since the project was announced in 1989 (Choi & McGee, 24 Apr 1991).
	Nov	Project Initiation	<ul style="list-style-type: none"> The Financial Study was published (Freeman Fox Maunsell, 1990).
	Dec	Project Initiation	<ul style="list-style-type: none"> The Additional Studies Report was issued (Freeman Fox Maunsell, 1990).
1990	Dec	Project Initiation	<ul style="list-style-type: none"> The decision on whether to build the airport railway would be made after a financial study of the project was completed in

Year	Month	Type of decision/event	Key decision/event
		Line Haul & Hubs	<p>early 1991. The project was expected to cost about HKD 15bn at present (Fitzpatrick, 12 Dec 1990). The estimated cost for ACP was now HKD 79bn, excluding the cost of the airport railway; the initial estimate for the airport railway was HKD 14-15bn at Dec 1990 prices (Wong, 12 Dec 1990).</p> <ul style="list-style-type: none"> The Highways Department and Planning Department had different alignment and interchange options for the Airport Railway (Leung, 17 Dec 1990).
1991	Jan	Project Initiation Project Initiation – Project Cost	<ul style="list-style-type: none"> The Airport Railway Feasibility Study Final Report was completed and was circulating in Government departments (Becker, 2 Jan 1991). Government commissioned consultants said delaying the airport railway by five years would cost HKD 1.272bn and an eight-year deferral would cost HKD 6.55bn. A three-year delay was the maximum acceptable (Leung, 21 Jan 1991).
	Feb	Project Initiation	<ul style="list-style-type: none"> A senior Cathay Pacific Airways official said the airport railway might not be cost-effective, that it was uncertain how to justify the cost of the railway and it would be hard to support it economically (Becker, 24 Feb 1991).
	Mar	Project Initiation	<ul style="list-style-type: none"> The Airport Railway Feasibility Study Final Report was published. It was commissioned by MTRC and prepared by Freeman Fox Maunsell. It included an environmental impact assessment (Freeman Fox Maunsell, 1991a).
	Jun	Project Initiation	<ul style="list-style-type: none"> On 27-30 June, discussions between representatives of the British and Chinese Governments took place in Beijing. The Memorandum of Understanding (MOU) was prepared on 4 July (HK Government, 1991a).
	Jul	Project Initiation Line Haul & Hubs Project Initiation Project Initiation Project Initiation Financing	<ul style="list-style-type: none"> Negotiations with the aim of reaching agreement between MTRC and Government were expected to begin by the end of 1991. The rail link had been put on hold previously. The Secretary for Transport, Mr Michael Leung, admitted the railway might not be ready in time for the opening of the airport in 1997 (Gittings, 7 July 1991). The route alignment for TCL was confirmed by senior Government officials. Hong Kong Station would be placed near Exchange Square instead of Star Ferry Pier as proposed earlier (Leung et al., 10 July 1991). The Airport Railway project was quietly dropped from the list of ACP in order to cut costs (Godfrey, 5 July 1991). The Airport Railway, which cost HKD 14.5bn, was excluded from the ACP because of the huge investment. However, the Sino-British agreement announced that it would now be included in the ACP (Leung et al., 10 July 1991). Consultants recommended a bus fleet of 138 double deckers to service the airport in 1997, rising to 236 buses in 2001 (HK Standard, 18 Jul 1991). The proposed equity injection to MTRC for the construction of Airport Railway would reduce from HKD 19.8bn to HKD 15bn in money of the day (Lee, 20 Jul 1991).
	Sept	Project Initiation	<ul style="list-style-type: none"> On 3 September, the British and Chinese Governments signed the Memorandum of Understanding (MOU), giving their firm support to the airport and associated projects (Airport Authority, 2009b). HK Government and MTRC began to

Year	Month	Type of decision/ event	Key decision/event
		Associated Development - C&W Reclamation Project Initiation Project Cost	negotiate terms under which MTRC would finance, construct and operate the Airport Railway (MTRC, 1991). <ul style="list-style-type: none"> Work for the Central Reclamation was originally scheduled to start in September 1992 (Anonymous, 1998). Kwai Tsing District Board members urged the Government to consult them before reaching any deal with MTRC over the airport railway project (Lai, 25 Sept 1991). The Government was negotiating with MTRC over the financing of the airport railway. MTRC identified property development opportunities along the airport railway, which could cover HKD 4.5bn of the HKD 15bn cost of the project (Lau, 15 Oct 1991).
	Dec	Project Initiation	<ul style="list-style-type: none"> MTRC and the Government were ready to sign the HKD 15bn airport railway financing deal. MTRC wanted government equity as well as protection so it did not have to face keen competition (Lau, 19 Dec 1991).
1992	Jan	Project Initiation Project Initiation –Land	<ul style="list-style-type: none"> On 2 January, MTRC agreed with the government to design, construct, finance and operate the Airport Railway (MTRC, 1992). The land premiums were expected to obtain between HKD 30bn and HKD 40bn from 60ha of land granted to MTRC for property development along the line (Wong, 23 Jan 1992).
		Implementation	<ul style="list-style-type: none"> MTRC established an in-house project management team and committed design work for the Airport Railway (MTRC, 1995).
	Mar	Associated Development - C&W Reclamation	<ul style="list-style-type: none"> Tenders for Central reclamation for the HK Station, estimated as HKD 1.8bn, would be called on 1 May 1992 (SCMP, 26 Mar 1992).
	Apr	Financing Project Initiation/ Financing Project Initiation	<ul style="list-style-type: none"> The Government injected HKD 13.6bn equity for the construction of Airport Railway and had committed to contingent liabilities of HKD 7bn prices in terms of callable equity for MTRC (in March 1991 prices); equivalent to HKD 12.5bn in 1993 prices (Yue, 3 Apr 1992; Cheung, 11 Apr 1992). After signing the MOU in July 1991, the HK Government promised to provide details of the airport's financing plan within three months. However, the British Government delayed its first submission of the plan to China for eight months, the information arriving only on 3 April 1992. In the financing proposal, the Government was to inject HKD 18.7bn equity into MTRC to build the Airport Railway, on condition that land granted to MTRC was outside the annual land disposal programme (Wong & Cheung, 6 May 1992; Ren, 22 May 1992; Bociurkiw & Yue, 23 Oct 1992). This was the first financial package offered by Britain to China. The estimated cost for Airport Railway had increased from HKD 12bn to HKD 22bn (Holberton, 8 Apr 1992).
	Apr	Project Initiation	<ul style="list-style-type: none"> 290 buses and 700 buses would be needed between the airport and urban areas if construction of Airport Express was deferred (Lau & Cheung, 8 Apr 1992).
		Project Initiation	<ul style="list-style-type: none"> United Democrats legislators threatened not to approve funding for the HKD 22.1bn airport railway project if noise prevention measures were not improved, particularly in Lai King

Year	Month	Type of decision/event	Key decision/event
1992		Project Initiation	and Cheung On Estate (Lau, 20 Apr 1992).
		Project Initiation	<ul style="list-style-type: none"> In contrast to the earlier patronage forecast by Government officials, which claimed about half of air travelers (39,000 passengers) would take Airport Express to the airport, MTRC predicted that only a third would use the Airport Express (Cheung, 11 Apr 1992).
		Project Initiation	<ul style="list-style-type: none"> Government officials claimed the formal agreement with MTRC on building the airport railway would be ready in summer 1992, suggesting that approval from the Chinese Government and financial commitment from the Finance Committee of LegCo would need to be obtained within about a month (Yue & Cheung, 17 Apr 1992).
		Project Initiation	<ul style="list-style-type: none"> The Government would have to pay compensation to MTRC of HKD 1.5bn if facilities needed for the railway were not completed on time. However, MTRC would face no penalty if it could not complete the project on time (Yue & Cheung, 17 Apr 1992).
		Project Initiation	<ul style="list-style-type: none"> Dr Victor Sit Fung-shuen, a member of Airport Consultative Committee (ACC), was concerned that MTRC would transfer the high construction costs to the public by raising fares on other MTR lines. He suggested the government should require MTRC to separate the financial accounts of the Airport Railway from that of the other lines in order to avoid cross-subsidisation (Yue, 18 Apr 1992). The feasibility of providing in-town check-in facilities would be studied by MTRC, PAA and major airline companies. The purpose of the study was to see whether this facility could attract more passengers to take the Airport Express. The preliminary estimates of the two check-in centres would cost hundreds of millions of dollars more (Ng, 22 Apr 1992).
	Apr	Project Initiation	<ul style="list-style-type: none"> Legislators of United Democrats said MTRC failed to convince them that the airport railway could be financially viable without subsidies from existing MTR lines. They did not believe MTRC would be able to repay the huge debt incurred by 2010 solely from revenues generated from the airport railway; consequently the debt would lead to escalating MTR fares. Therefore, they warned that they might vote against the financial proposals if MTRC and the Government failed to clarify the project's financial viability. Also, democrats were worried that MTRC and the Government had been too optimistic in forecasting future ridership (Cheung, 28 April 1992; Legco, 13 May 1992).
	May	Project Initiation	<ul style="list-style-type: none"> A pressure group, the Hong Kong Association for Democracy and People's Livelihood, urged the Government to shelve the airport railway project because its expensive fares would result in it serving the wealthy rather than the general public (Ren, 17 May 1992).
		Project Initiation – Project Cost	<ul style="list-style-type: none"> Hong Kong (representing British) and Chinese officials started unofficial meetings on the airport before the formal Joint Liaison Group's Airport Committee meeting. The discussion was mainly about the question of escalating costs (Gittings, 17 May 1992).
1992		Project Initiation	<ul style="list-style-type: none"> About HKD 423m was required to implement noise mitigation measures including the installment of noise barriers

Year	Month	Type of decision/event	Key decision/event
		Project Initiation Project Initiation – Project Cost	<p>and enclosures for railway and noise insulation for the North Lantau, Ma Wan and Central areas. Yet, noise and water pollution in West Kowloon would remain serious. An environmental project office would be set up in July (Wong, 22 May 1992).</p> <ul style="list-style-type: none"> 16 LegCo members, excluding the UDHK legislators, show their support for completion of the airport railway (Cheung & Law, 22 May 1992). The cost of the Airport Railway project was now estimated at HKD 23bn (in Apr 1992 prices), due to changes to the design of Tung Chung station (Wong & Cheung, 23 May 1992).
	Jun	Project Initiation & Financing Project Initiation – Project Cost Project Initiation Associated Development- C&W Reclamation Project Initiation/ Line Haul & Hubs	<ul style="list-style-type: none"> Governor Lord Wilson paid his last official visit to Beijing in early June. The meeting between Lord Wilson and Mr Lu Ping, China's top official on HK affairs, was described as 'very friendly'. Although both sides agreed the airport should be built as soon as possible, Chinese officials expressed reservations about the escalating estimated cost of ACP projects (Cheung & Wong, 8 June 1992). The Chinese were unhappy about the increases in cost estimates, from HKD 12.5bn to HKD 22.5bn in nine months, and about providing callable equity (i.e. debt) of HKD 21bn to MTRC and Airport Authority. However, Lord Wilson refused to scale down the ACP projects in order to gain Chinese agreement on financing (Chen, 10 Jun 1992). The Government revealed that the actual cost of the Airport Railway project would be HKD 33.5bn by completion in 1997, based on the estimate of HKD 22.1bn in March 1991 prices (Chen & Wong, 13 Jun 1992). Tsing Yi residents were concerned about noise pollution during and after construction, and called for more effective mitigation. Legislators said the railway should be completely instead of partly covered as proposed by MTRC (Wong, 8 June 1992). Finally, air-conditioners and insulation glass were installed for Tsing Yi residents but residents in Lai King Estate had received nothing (HK Standard, 16 Jun 1992). Work on Central-Wanchai Reclamation, which would provide land for Hong Kong Station, was planned to begin in October. The first phase, with 20 hectares of land, would be finished in mid-1995. A plot ratio of 1:12 would be allowed for commercial buildings above the station (9 June 1992). Co-operative Resources Centre (of China) proposed measures to cut more than HKD 4bn from the construction cost, to reduce the amount of callable equity. It suggested that as Tung Chung would only have 20,000 people by 1997, it was expensive to build an underground railway there, and that this section could be delayed. It also suggested trimming the HKD 2bn budget for employing consultants. However, legislators representing the engineering sector in LegCo claimed that the proposed measure would only save a small amount of money (Chen & Cheung, 18 Jun 1992; Wong, 29 Jun 1992).
	Aug	Associated Development - C&W Reclamation	<ul style="list-style-type: none"> The project director of the Urban Area Development Office under the Territory Development Department, Mr Keith Austin, said the airport railway would not be completed on time, by mid-1997, unless funds were made available for the Central-Wanchai reclamation in October 1992, which would cost about HKD 2.8bn at 1997 prices (Yue, 20 Aug 1992).

Year	Month	Type of decision/event	Key decision/event
1992	Sept	<p>Associated Development- C&W Reclamation</p> <p>Project Initiation</p> <p>Project Initiation & Financing</p> <p>Project Initiation & Financing</p> <p>Project Initiation & Financing</p> <p>Project Initiation</p> <p>Line Haul</p> <p>Project Initiation – Project Cost</p>	<ul style="list-style-type: none"> Central Reclamation work was originally scheduled to start , but due to political difficulties, negotiations to obtain Chinese government approval took longer than expected (Griffiths, 1996). Chinese sources said no further agreement would be reached until the policy address of Chris Patten, HK Governor, in October (Free, 2 Sept 1992). On 9 September, Chinese officials proposed an increase in the level of equity injection and dropping the callable equity and dividend deferral provisions. They suggested land premiums generated from property developments along the route be used to fund the project. Currently, the proposed direct equity injection was HKD 3.7bn and the callable equity was HKD 12.5bn (Ren, 8 Sept 1992; MTRC, 1993a). MTRC said it would consider the Chinese proposal (Yue, 11 Sept 1992). On 17 September, the HK Government announced its second financial package to China. It shifted its financial proposal from the original debt financing to equity funding. An equity injection from HKD 3.7bn to HKD 18.7bn to MTRC would be generated by premium income from selling 62 hectares of land (Wong, 18 Sept 1992). On 22-23 September, Chinese non-official sources objected to the British proposal; meanwhile, Governor Chris Patten was losing patience with Chinese reluctance and delays over the endless financial talks (Law & Wong, 23 Sept 1992). The consultancy programme for the design for Airport Railway was planned to start in February 1993 and to be completed in 12-18 months. Consultants were invited and the contracts managed by PAA (Reuters, 28 Sept 1992). The Association for Democracy and People's Livelihood suggested the Airport Railway be extended to Butterfly Bay in Tuen Mun by a tunnel, to provide a convenient route for western New Territories residents to travel to Central (SCMP, 29 Sept 1992). The estimated cost of the project was HKD 33.5bn at current prices (SCMP, 30 Sept 1992).
	Oct	<p>Project Initiation & Financing</p> <p>Project Initiation</p>	<ul style="list-style-type: none"> HK Governor, Chris Patten, announced his policy address on 7 October. He warned China that the ACP might not be fully completed before 1997 if the airport funding row continued. He also said HK might have to begin airport construction on its own if the financing issue remained unresolved. HK would finance what it could before 1997 and leave the uncompleted parts to be paid for by HKSAR Government. Yet the railway would have the lowest priority in the HK-funded ACP project. Legislators were divided on whether HK should fund the projects alone (Free & Ren, 9 Oct 1992; Cheung, 12 Oct 1992a&b). If the Airport Railway was to be axed, its five associated property development sites would also be axed. However, MTRC hoped to begin inviting tenders from potential joint-venture developers in 1993 to develop the sites. It was still waiting for approval from the Land Commission. Developers were expected to pay HKD 42.5bn in land premiums to develop the sites (SCMP, 15 Oct 1992).

Year	Month	Type of decision/event	Key decision/event
1992		Project Initiation	<ul style="list-style-type: none"> Negotiations between the two Governments over the airport talks on 15 October ended at a hostile deadlock (Cheung, 16 Oct 1992).
	Nov	Associated Development Project Initiation	<ul style="list-style-type: none"> Tenders to design and construct the western immersed tube tunnel and Rambler Channel Bridge were scheduled to be invited in December 1992; the award of the tube tunnel contract and the bridge were scheduled for June and September 1993 respectively. Tenders for the rock tunneling contracts at Tsing Yi and Lantau were expected to be invited by the end of 1993. Unfortunately, the contract for the Central Reclamation could not be awarded until the Government had authorized funding, although the two tenders had already been selected and would be invalidated after the end of 1992 (SCMP, 25 Nov 1992). The legislators and the director of NAPCO, Mr Gordon Siu, urged the Chinese and British Governments to resume financial talks for the airport and Airport Railway. Legislators pointed out that June 1993 would be a crucial date because it would take four years to build the Airport Railway, and so construction work should be started by June 1993 at the latest (Cheung & Ng, 30 Nov 1992).
	Dec	Financing Project Initiation	<ul style="list-style-type: none"> MTRC had incurred expenditure of HKD 422m as at 31 December 1992 and had entered into commitments of HKD 605m in connection with the preparation for the Airport Railway project (MTRC, 1993a). The detailed design of the station and work on the master plan for the extensive commercial development on the site began (Anonymous, 1998).
1993	Jan	Project Initiation & Financing Associated Development - C&W Reclamation	<ul style="list-style-type: none"> LegCo was asked to approve funding of HKD 666m to build the tunnel for the Airport Railway under the route of the West Kowloon Expressway, as it would be difficult and more expensive to build it after the expressway was built. According to the Government's original plan, a rail line would be built eventually to ease congestion along the Nathan Road MTR. The work would include 920m of cut-and-cover tunnel through the Yau Ma Tei Interchange site with the West Kowloon Expressway contracts. It was silently approved by LegCo (Ren, 6 Jan 1993; Cheung, 6 Jan 1993). The validity of the Central and Wanchai Reclamation project's contract, already extended from December 1992 to 1 February 1993, was expected to be extended again pending Chinese approval (SCMP, 21 Jan 1993).
	Feb	Project Initiation & Financing	<ul style="list-style-type: none"> MTRC submitted a revised financing proposal for the Airport Railway to HK Government. Despite the refusal to disclose figures, it was known that MTRC suggested the Government eliminate the HKD 12.5bn callable equity provision and instead provide extra cash to pay for the project. Legislators urged both Governments to resume airport talks as soon as possible (Cheung, 3 Feb 1993).
	Mar	Associated Development - C&W Reclamation	<ul style="list-style-type: none"> The validity of the tender for the Central and Wanchai Reclamation was extended to early April due to uncertainty. The Government admitted that if the reclamation project was further delayed beyond June, the Airport Railway could not be opened on day one of the opening of the airport (Cheung &

Year	Month	Type of decision/event	Key decision/event
		Project Initiation	Chan, 6 Mar 1993). <ul style="list-style-type: none"> According to MTRC's project director, Mr Russell Black, the opening of the Airport Railway would be phased, with the Kowloon Station opening first in 1997 followed by Hong Kong Station four months later. Tenders for the design and construction of the Western Immersed Tube Tunnel were received and would be awarded in mid-1993 (SCMP, 26 Mar 1993a). MTRC's finance director, Mr Roger Moss, said MTRC would not ask for funds from the world financial market unless an agreement and support from China was granted for the airport railway project (SCMP, 26 Mar 1993b; SCMP, 27 Mar 1993).
	May	Project Initiation & Financing	<ul style="list-style-type: none"> The airport negotiations had remained stagnant since the JLG Airport Committee met in October 1992. Although the third financial proposal was forwarded to China secretly in April 1993, no date for resuming formal talks was scheduled yet and the details of the new proposal were tight-lipped. Nevertheless, positive signals were given from Beijing and it was understood that the airport project would go ahead. Informal talks continued (Wong & Fan, 22 May 1993).
	Jun	Project Initiation & Financing Implementation Project Initiation	<ul style="list-style-type: none"> Airport talks by JLG Airport Committee resumed on 4 June after being postponed for seven months. Under the revised proposal, the Airport Authority and MTRC were expected to be granted a capital injection of HKD 50bn. HKD 30bn would come from premiums on property development along the route and the remainder from fiscal reserves (Wong, 4 Jun 1993). Contracts for construction works for Airport Railway which were under other ACP projects were subsequently out to tender. These included the Tung Chung section of the North Lantau Expressway, sections of West Kowloon Expressway, reclamation at Tai Ho and Yam O, tracks at the lower decks of Lantau Fixed Crossing, Kwai Chung and Rambler Channel sections at Route 3 (SCMP, 25 Jun 1993). While China gave green lights to other ACP projects such as Western Harbour Crossing, there were still no signs for the Airport Railway. It was understood that China still wanted HK Government to increase the level of equity injections. The validity of the tender for the Central Wanchai Reclamation had already been extended four times, and next expired on 1 July 1993 (Wong, 30 Jun 1993).
	Jul	Line Haul	<ul style="list-style-type: none"> District members from Tuen Mun suggested extending the Airport Railway to meet Lingdingyang Bridge in order to link between Tuen Mun and Zhuhai (Ng, 6 Jul 1993).
	Sept	Implementation Implementation & Financing	<ul style="list-style-type: none"> The government contract was entrusted to MTRC to start the Central reclamation in 1993. Dragages-Penta-BSG Joint Venture was appointed to do the reclamation work (NAPCO, 1998b). As a result of the one-year delay, the Secretary for Works announced that it was unable to complete Hong Kong Station until the second quarter of 1998 (LegCo, 1994c). LegCo approved HKD 449m for the sections that were to be incorporated under Route 3's contract. These specifically included two train viaducts in Rambler Channel Bridge and Kwai Chung viaduct project which had to be incorporated by 3 October, or would otherwise have to wait 30 months when the sections were completed. This fund came from the approved

Year	Month	Type of decision/event	Key decision/event
1993	Dec		contingency fund from the Route 3 project (Ng, 25 Sept 1993).
		Project Initiation Financing	<ul style="list-style-type: none"> MTRC again urged the two governments to reach consensus. Chinese Government support for the financing arrangements for the project still had not been received by the end of 1993, thus the formalization of the Railway Agreement had been delayed. MTRC could not raise money on the world financial markets until it had Chinese support. Therefore, timely construction contract awards to open the Railway in June 1997 could not be made. The opening date for the Railway slipped on a day for day basis (MTRC, 1993b; Ball, 4 Dec 1993). According to the Industrial Bank of Japan, bankers were tired of waiting for the resolution of the financing arrangements for the airport and the airport railway, yet it would be willing to support both the AA and the MTRC (SCMP, 16 Dec 1993b).
1994	Jan	Project Initiation & Financing	<ul style="list-style-type: none"> An internal study by the Finance Branch concluded that the Airport Railway could not be completed by mid-1997 as scheduled. The costs of building it would rise by HKD 2.1bn if the completion date was deferred by six months and HKD 4.2bn if delayed for a year (Wong, 10 Jan 1994).
		Project Initiation & Financing	<ul style="list-style-type: none"> The British/HK Government again urged China to engage in direct meetings instead of negotiating through press statements. They said they had attempted to initiate talks with the Chinese side and asked for responses to the proposed financial packages many times, but that no responses were made (Wong & Cheung, 13 Jan 1994).
		Project Initiation	<ul style="list-style-type: none"> Tsing Yi action group feared the delay of Airport Railway would cause inconvenience and traffic congestion to 180,000 residents who wanted MTR services in the district by 1997 (Luk, 17 Jan 1994).
		Project Initiation & Financing	<ul style="list-style-type: none"> According to the Financial Secretary, Sir Hamish Macleod, the latest prediction of fiscal reserves (excluding the HKSAR Land Fund) left on 30 June 1997 would be HKD 78bn; the director of HKMAO, Mr Lu Ping, predicted there would be HKD 100bn left in the Land Fund by 1997. China could hardly reject British financing plans for the airport and its rail link on the ground of insufficient money left for HKSAR Government. The remaining questions were the size and nature of the debt. However, it became more politically viable for the HK Government to inject more money into the project (Wong, 19 Jan 1994; SCMP, 20 Jan 1994; SCMP, 21 Jan 1994).
		Project Initiation & Financing	<ul style="list-style-type: none"> Despite uncertainties over the Airport Railway's fate, HK Government sought further funding of HKD 145m from LegCo to start preliminary work on the railway, including Yam O and Tung Chung sections of the North Lantau Expressway, sections of the Western Kowloon Expressway and track-laying works. MTRC would reimburse the money to the Government. Notwithstanding the condemnation by the Chinese, both the UDHK and Liberal Party supported the request (Choy & Ngai, 25 Jan 1994).
1994	Jan	Associated Development	<ul style="list-style-type: none"> Based on current market indicators, the land premium of the property development along the route increased by at least 50% and could go up to HKD 60bn due to the current market boom and high land value (Wong, 20 Jan 1994).
	Feb	Project Initiation & Financing	<ul style="list-style-type: none"> On 1 February, the Government announced that a fourth financing package had been proposed to China. Under the new package, Britain had offered to increase its equity injection to

Year	Month	Type of decision/event	Key decision/event
1994		Project Initiation Financing & Implementation	<p>HKD 60.3bn and the total borrowing would be reduced to HKD 23bn, although it was still far higher than the HKD 5bn specified in the MOU. Yet, Britain was willing to increase the cash injection as long as the 62 hectares of land along the route could be granted together without going through the annual Sino-British Land Commission talks (Wong & Cheung, 4 Feb 1994; LegCo, 1994c; Cheung, 14 Mar 1994).</p> <ul style="list-style-type: none"> • MTRC had employed 524 planners and engineers to date to work on the Airport Railway project although the Chinese Government's blessing had not been given. It was still hiring engineers and designers (HKS, 6 Feb 1994). • MTRC had spent HKD 1.5bn on the project to date, with an advance of HKD 4.3bn approved by the LegCo Finance Committee, (a total of HKD 5.8bn committed) (Wong, 16 Feb 1994).
	Apr	Project Initiation & Financing Project Initiation	<ul style="list-style-type: none"> • The HK Government again asked LegCo to transfer HKD 64m from contingency funds to construct the Central Subway linking Central Station to Hong Kong Station (Kwang, 1 Apr 1994). • MTRC said the Airport Railway would not be ready until autumn 1997 at the earliest if the finance agreement was not ready yet, and it would now open in two phases. The section between Central and Kowloon would open in April 1998 due to the delay in government funding for the Central reclamation project. The Airport Railway was originally planned to be operational in June 1997 (Ball, 21 Apr 1994). • The Liberal Party urged the British and Chinese Governments to adopt a co-operative attitude to dealing with the controversy on the financial arrangements of the Airport Railway (LegCo, 1994c).
	May	Project Initiation & Financing Implementation Project Initiation Project Initiation & Financing	<ul style="list-style-type: none"> • Delays in the financial agreement and rocketing land prices resulted in a 150% increase from HKD 40bn (estimated in 1992 prices) to HKD 100bn in estimated land premiums from property development. This was expected to favour the negotiations in dealing with the airport railway financing (Wong, 10 May 1994). • An option letter was awarded by MTRC to Shui On Civil Contracts, China Fujian Corp and Amec Construction South East Asia for Contract 503B. The letter was valid for a year and would be converted into a full contract once Britain and China had signed an airport finance agreement (Wallis, 11 May 1994). • Negotiations between the two Governments resumed on 20 May, after a lapse of more than nine months (Yeung, 18 May 1994). No agreement was made but signs of optimism were found (Reuters, 3 Jun 1994). • The Government sought approval from LegCo for HKD 820m to build the Western Immersed Tunnel across the harbour. This was the first request for funding solely related to the airport railway (Wang & Chan, 22 May 1994).
	Jun	Financing & Implementation Financing Project Initiation	<ul style="list-style-type: none"> • The request for funds to build the Western Immersed Tunnel was approved in early June. Instead of the requested HKD 820m, HKD 715m was approved due to lower tender prices submitted to MTRC. This represented 3% of the HKD 23.7bn equity injection into MTRC. Tarmac International and Kumagai Gumi were jointly awarded the contract (Choy, 4 Jun 1994).

Year	Month	Type of decision/ event	Key decision/event
1994			<ul style="list-style-type: none"> The Financial Secretary, Hamish Macleod, revealed the details of the fourth financial package. The equity injection was proposed to be HKD 23.7bn (Reuters, 3 Jun 1994). Both sides were close to drafting a deal (Reuters News, 27 Jun 1994).
	July	Implementation Associated Development - Tung Chung & Kowloon	<ul style="list-style-type: none"> A contract was awarded to Kumagai Tarmac Joint Venture for the Western Immersed Tube Tunnel project (NAPCO, 1998b). The master plans for the property development in Tung Chung and Kowloon Stations received approval from the Town Planning Board, but the plans still had to be approved by the Buildings Department before construction could commence. The Tung Chung and Kowloon Station developments cost HKD 30bn and HKD 80bn respectively (Sito, 26 Jul 1994).
	Aug	Associated Development - Tung Chung & Olympic	<ul style="list-style-type: none"> MTRC invited tenders for the first phase of property development at Tung Chung and Tai Kok Tsui Stations (SCMP, 7 Sept 1994).
	Sept	Implementation	<ul style="list-style-type: none"> The first section of Western Immersed Tube Tunnel was towed into Victoria Harbour and installed in mid-September, and the other sections of the tube itself were to be laid in April 1995 (Clark, 9 Sept 1994). The construction of Central Reclamation was in full swing (SCMP, 14 Sept 1994).
	Nov	Project Initiation & Financing	<ul style="list-style-type: none"> On 4 November, the Airport Committee of the Sino-British Joint Liaison Group signed the Agreed Minute on the financing of the airport and Airport Railway after China and Britain had spent two years negotiating the financial arrangements for the ACP projects (Airport Authority, 2009b). The HK Government had submitted four sets of financial proposals to the Chinese Government. Both sides agreed that the HK Government would inject HKD 60.3bn equity for the airport and its railway, and agreed the level of AA and MTRC borrowing from the government would be capped at HKD 23bn including interest (SCMP, 5 Nov 1994).
		Project Initiation – Land	<ul style="list-style-type: none"> On 17 November, the Sino-British Land Commission agreed the allocation of 62 hectares of Airport Railway development land. The land had to be granted by the commission before borrowing could begin to pay for the project (MTRC, 1994; Stormount, 17 Nov 1994).
		Project Initiation & Financing	<ul style="list-style-type: none"> On 18 November, the Finance Committee of LegCo approved the commitment to inject equity of HKD 22.9bn (excluding HKD 715m for the Western Immersed Tunnel in June) and a capped debt of HKD 11.4bn (MTRC, 1993b; Law, 19 Nov 1994).
		Associated Development- Olympic & Tung Chung Implementation	<ul style="list-style-type: none"> Powerful enterprises were lined up to bid for the property development projects at Tai Kok Tsui and Tung Chung stations when the tenders closed on 18 November. Results of the two tenders were expected to be made public by the end of February 1995. These projects would straddle the handover to China in 1997. Property analysts said the strong response indicated to some extent that the companies were confident in HK's real estate market (Sito, 19 Nov 1994). Aoki Corporation was awarded a civil engineering contract to build Tung Chung Station at a cost of HKD 1.1bn on 21

Year	Month	Type of decision/event	Key decision/event
		Implementation	November (Wallis, 23 Nov 1994).
		Implementation	<ul style="list-style-type: none"> Contracts were signed with a consortium of Kumagai Gumi, Entrecanales and Cubiertas for the construction of Kowloon Station at a cost of HKD 2.6bn on 21 November (Wallis, 23 Nov 1994).
		Implementation	<ul style="list-style-type: none"> Construction of Tung Chung and Kowloon Stations began on 28 November (Wallis, 23 Nov 1994).
		Implementation	<ul style="list-style-type: none"> Another contract went to AEG/CAF joint venture for the supply of rolling stock on 21 November. Eleven five-car sets for the AEL and 12 six-car sets for the TCL would be made (Wallis, 23 Nov 1994).
		Implementation	<ul style="list-style-type: none"> A HKD 470m contract was awarded to GEC Alsthom Transport SA in late November for a signaling system (Wallis, 29 Nov 1994).
		Implementation	<ul style="list-style-type: none"> The contract for the design and construction of Rambler Channel Bridge, worth HKD 490m, was awarded to a joint venture of Dragages et Travaux Publics and Penta-Ocean Construction in late November (Wallis, 29 Nov 1994).
		Implementation	<ul style="list-style-type: none"> A contract worth HKD 270m was awarded to a consortium of GTM International, CFE and Wan Hin for the construction of Kwai Chung Park Viaducts in late November (Wallis, 29 Nov 1994).
		Implementation	<ul style="list-style-type: none"> Balfour Beatty was awarded a HKD 180m contract for the supply of the overhead power system along the railway and Siu Ho Wan train depot in late November (Wallis, 29 Nov 1994).
			<ul style="list-style-type: none"> The main workshop area of depot reclamation was handed over to MTRC on 28 November (MTRC, 1994).
	Dec	Implementation	<ul style="list-style-type: none"> MTRC aimed to open the Airport Railway in a single stage in 1998 instead of in two phases as originally planned (Ball & Wallis, 1 Dec 1994).
		Implementation	<ul style="list-style-type: none"> Contract 501A – Central Subway was awarded on 1 December to Kier-Sun Fook Kong Joint Venture at a cost of HKD 720m (Reuters, 1 Dec 1994).
		Implementation	<ul style="list-style-type: none"> MTRC awarded a HKD 760m contract to Maeda Corp to build Lai King Station and tunnels on 1 December (Reuters, 1 Dec 1994).
		Implementation	<ul style="list-style-type: none"> A Maeda Corp and Kumagai Gumi (Hong Kong) Ltd joint venture won a HKD 1.8bn contract for the Tsing Yi station and associated facilities on 2 December (Reuters, 2 Dec 1994).
		Implementation	<ul style="list-style-type: none"> A John Laing International Ltd and Hip Hing Construction Co Ltd joint venture won a HKD 430m contract for the Tai Kok Tsui station and associated facilities on 2 December (Reuters, 2 Dec 1994).
		Implementation	<ul style="list-style-type: none"> Downer and Co Ltd and Ed.Zublin AG joint venture won a HKD 430m contract for the Tsing Yi tunnels and viaducts on 2 December (Reuters, 2 Dec 1994).
		Implementation	<ul style="list-style-type: none"> Several contract tenders were now being assessed including the airport railway depot, its trackwork, Tai Kok Tsui and Tung Chung Station property developments (SCMP, 6 Dec 1994).
		Implementation	<ul style="list-style-type: none"> On 9 December, GEC (HK) Ltd was awarded a HKD 540m contract for a power supply system and GPT (Exports) Ltd was awarded a HKD 330m contract for communication systems works for the railway (Reuters News, 9 Dec 1994a & b).
			<ul style="list-style-type: none"> On 15 December, a HKD 170m contract for escalators was

Year	Month	Type of decision/event	Key decision/event
		Implementation	awarded to Construction Industrielle de la Mediterranee. Work would commence on 16 January 1995 (Reuters News, 15 Dec 1994).
		Implementation	<ul style="list-style-type: none"> On 23 December, MTRC awarded a HKD 183m contract for an automatic fare collection system to Thorn Transit Systems International Ltd and a HKD 280m contract for an environmental control system to AMEC E&M Engineering Ltd (Reuters News, 23 Dec 1994a &b). By year end, construction works were approximately 42% completed (MTRC, 1994).
		Implementation	
1995	Jan	Project Initiation	<ul style="list-style-type: none"> The MTRC and AA and bankers were waiting for the Financial Support Agreement between UK and China. The two Corporations were unable to raise funds from banks until the agreement was in place (The Bankers, 1 Jan 1995). Shui On Joint Venture was awarded a HKD 825m contract for construction work for the Airport Railway including the main depot building and 19 other buildings for train maintenance (AWSJ, 16 Jan 1995).
		Implementation	
	Feb	Implementation	<ul style="list-style-type: none"> Construction work on Siu Ho Wan Depot started (Anonymous, 1998).
	Mar	Implementation	<ul style="list-style-type: none"> On 3 March, Gammon-Balfour Beatty Joint Venture was awarded a HKD 1.28bn civil engineering contract for the track-work. This included the design, construction, installation and testing of the tracks for the railway. The joint venture was also responsible for the supply and installation of fencing, noise barriers, passenger platforms and electrical and mechanical service cable troughs (AWSJ, 6 Mar 1995).
		Associated Development-Tung Chung & Olympic	<ul style="list-style-type: none"> Bidders for the property developments along Tung Chung and Olympic Stations complained about the high land premiums set by the Government. MTRC was negotiating with the Government to reduce the premiums (Sito & Porter, 3 Mar 1995). On 16 March, the Government agreed to reduce the premiums by approximately 10% (SCMP, 16 Mar 1995).
		Associated Development-Tung Chung	<ul style="list-style-type: none"> MTRC announced the consortium led by Hang Lung Group Ltd would develop Tung Chung Package One at an estimated cost of HKD 10bn including land premiums (Porter, 18 Mar 1995).
		Project Initiation	<ul style="list-style-type: none"> The latest estimated ticket price for the Airport Railway was between HKD 70 and HKD 80 at opening in 1998 (SCMP, 24 Mar 1995).
		Implementation	<ul style="list-style-type: none"> Residents at Lai King Estate complained to MTRC about noise and vibration levels, which exceeded the agreed 75 decibels in 1993. Current noise had reached over 90 decibels and averaged at 80-85 decibels a day. About 19,000 residents were directly affected by the noise. Meanwhile, residents criticised the EPD for not monitoring it, and a spokesman admitted that EPD was powerless to act (Wallis, 27 Mar 1995).
		Associated Development-Olympic	<ul style="list-style-type: none"> The tender of Package 1 for Tai Kok Tsui Station Development was awarded to a consortium led by Sino Land (Porter, 28 Mar 1995).
1995	Apr	Implementation	<ul style="list-style-type: none"> GEC (Hong Kong) Ltd was awarded a HKD 217m electrical and mechanical engineering contract for the trackside and ancillary buildings work. Work began on 10 April (Reuter News,

Year	Month	Type of decision/event	Key decision/event
		Implementation	<p>7 Apr 1995).</p> <ul style="list-style-type: none"> Faiveley Transport was awarded a contract worth HKD 212m for the design, manufacture and installation of the platform screen doors for the railway. Work started on 10 April (Reuters News, 10 Apr 1995).
	Jun	Associated Development - Hong Kong	<ul style="list-style-type: none"> Cheung Kong Group and CITIC Pacific and several developers expressed an interest in bidding for the Hong Kong Station property development. Tendering for the Central complex would start between June and September. Expressions of interests had to be submitted by 16 June (Sito, 5 Jun 1995).
		Implementation	<ul style="list-style-type: none"> The civil engineering contract for Hong Kong Station was signed on 10 June, the last civil engineering contract to be awarded. Aoki Corp won the contract at a HKD 4.07bn price. Construction began (Reuters News, 10 Jun 1995).
		Implementation	<ul style="list-style-type: none"> The first segments of the Western Immersed Tunnel, consisting of four concrete tubes, were almost completed in a casting basin at Shek O quarry (Wallis, 12 Jun 1995).
		Implementation	<ul style="list-style-type: none"> The first parcel of reclaimed land in Central was handed over to the main contractor, Aoki Corporation (Mackie, 1997).
		Implementation	<ul style="list-style-type: none"> Construction works for Hong Kong Station commenced and the station was due to be completed in 1998 (Pitman, 1996a).
		Project Initiation/Financing	<ul style="list-style-type: none"> On 30 June, the signing of the Financial Support Agreements by China and Britain reaffirmed their support for the project, and implied that MTRC could raise loans amounting to HKD 11.4bn from banks (Kennedy & Fung, 1 July 1995).
	July	Implementation	<ul style="list-style-type: none"> The Airport Railway was scheduled to be opened in June 1998 (Lee, 6 Jul 1995).
		Implementation	<ul style="list-style-type: none"> Construction of the second batch of units of the Western Immersed Tube Tunnel commenced (Anonymous, 1995a).
		Project Initiation	<ul style="list-style-type: none"> On 5 July, the Airport Railway Agreement (an agreement for the design, construction, financing, and operation of the Airport Railway) was signed between the Government and MTRC. The agreement required the project to be completed within the cost estimate of HKD 35.1bn (MTRC, 1997).
		Project Initiation	<ul style="list-style-type: none"> Following the signing of agreements, Moody's Investors Service and Standard & Poor's confirmed their ratings for the MTRC. Meanwhile, MTRC confirmed on 18 July that it would issue a HKD 5bn seven-year revolving syndicated loan facility (Kennedy, 19 Jul 1995).
		Project Initiation	<ul style="list-style-type: none"> On 19 July, the Legislative Council passed the Airport Authority Bill, endorsing the establishment of the permanent Airport Authority (Airport Authority, 2009b).
		Associated Development-Kowloon	<ul style="list-style-type: none"> The master plan of Kowloon Station development was revised in mid-1995. The proposed height of the buildings exceeded the airport height restrictions. The Town Planning Board and the Government were yet to decide whether to grant a concession for MTRC. Property developers had expressed an interest in July although the revised plan for the station development was yet to be approved by Town Planning Board (Pitman, 1996a; Sito, 22 Jul 1995).
		Associated Development-	<ul style="list-style-type: none"> Developers began forming consortia to bid for the property development rights above Tsing Yi Station. The deadline for

Year	Month	Type of decision/event	Key decision/event
		Tsing Yi	submission of tenders was 25 August. The proposed land premium was HKD 1,900 per sq ft (Sito, 16 Aug 1995).
	Sept	Associated Development – Kowloon	<ul style="list-style-type: none"> The tender submission for Package One of the Kowloon Station property development closed on 1 September (Sito, 22 Jul 1995). MTRC signed its first agreement for the HKD 6bn syndicated loan facility on 7 September (Reuters News, 7 Sept 1995). MTRC would shortlist the bids for the property development at Tsing Yi Station, for which at least five bidders had submitted tenders (Sito, 8 Sept 1995). MTRC awarded a HKD 146m electrical and mechanical engineering contract to Otis Elevator (HK) Ltd for the design, manufacture, supply, installation, testing and commissioning of lifts within TCL and AEL stations (Reuters News, 8 Sept 1995). The construction of the Airport Railway was 17% complete (Wallis, 15 Sept 1995). The Lands Department reduced the land premium for the property development above Tsing Yi Station to HKD 4bn. Meanwhile, MTRC was short-listing bids for the Tsing Yi Station development (Sito, 22 Sept 1995). On 26 September, a consortium of developers comprising Cheung Kong (Holdings) Ltd, Hutchison Whampoa Ltd and CITIC Pacific Ltd was awarded the HKD 7bn contract for the Tsing Yi Station property development. The estimated development cost would be about HKD 6bn to HKD 7bn including the HKD 4.34bn land premium paid to HK Government (Sito, 26 Sept 1995).
		Financing	
		Associated Development- Tsing Yi	
		Implementation	
		Implementation	
		Associated Development- Tsing Yi	
		Associated Development- Tsing Yi	
	Nov	Associated Development - Kowloon	<ul style="list-style-type: none"> MTRC sent out letters on 10 November notifying short-listed bidders that they had reached the next stage of bids for the property development at Kowloon Station (Porter, 10 Nov 1995). MTRC revealed its revised plan for the Kowloon Station property development. It planned an 88-storey office and hotel tower, taking advantage of more generous height restrictions after Kai Tak Airport moved in 1998 (Sito, 22 Nov 1995). The Sino Land-led consortium arranged a HKD 5.75bn syndicated loan to fund the Tai Kok Tsui station development. The estimated cost was about HKD 10bn including the land premium (Ko, 29 Nov 1995).
		Associated Development – Kowloon	
		Associated Development - Olympic	
	Dec	Implementation	<ul style="list-style-type: none"> On 1 December, the Airport Authority Ordinance came into effect (Airport Authority, 2009b). MTRC formally invited short-listed bidders to submit formal tender proposals for Package One of the Hong Kong Station property development. The tender closed on 12 January 1995 (Sito, 2 Dec 1995). MTRC decided to divide the Hong Kong Station property development package into six phases although only a single package would be up for tender. By doing so, the project would hopefully be more manageable, boosting bidding interest. The station's property project was now estimated to cost HKD 40bn (Ko, 13 Dec 1995). By the end of 1995, 30% of the civil work by value was completed (MTRC, 1995b).
		Associated Development - Hong Kong	
		Implementation	
1996	Jan	Associated Development -	<ul style="list-style-type: none"> FFive consortia, comprising at least 14 developers, submitted bids for the property development at Hong Kong

Year	Month	Type of decision/ event	Key decision/event
		Hong Kong	Station and the tender was closed on 12 January. The land premium was not given to the developers before bidding and some developers were concerned that this created a very risky investment (Ko & Sito, 10 Jan 1996; Sito & Ko, 13 Jan 1996).
	Feb	Associated Development – Kowloon Implementation	<ul style="list-style-type: none"> Package One of the development of Kowloon Station (The Waterfront) was awarded to a consortium led by Wing Tai Holdings Ltd on 16 February. Its estimated cost was HKD 7.7bn and completion was expected in 2000. The land premium was set at about HKD 3.3bn to HKD 3.5bn (HKD 2,075 to HKD 2,200 per sq ft) (Sito, 1 February 1996; Reuters News, 16 Feb 1996; MTRC, 1996b). The Airport Railway project was 25% complete, but it was too early to conclude whether it could be finished on time. For Hong Kong Station, the contractor Aoki was now excavating underground passenger walkways and platforms. Meanwhile, Kier HK-Sun Fook Kong JV had nearly completed the initial piling and foundations work for the Central passenger subway and Kumagai Gumi-Tarmac JV had towed the sixth unit of the Western Immersed Tunnel tube from Tseung Kwan O and sunk it on the seabed. All tubes should be completed, floated out and sunk into position by late summer of 1996 (SCMP, 4 Feb 1996).
1996	Mar	Associated Development - Olympic Associated Development - Hong Kong	<ul style="list-style-type: none"> The Bank of China and Hang Seng Bank together with 22 international banks and financial institutions help finance the property development at Tai Kok Tsui with a syndicated loan of HKD 5.75bn on 11 March (Porter, 12 Mar 1996). The development rights of the commercial development at Hong Kong Station were awarded to a consortium of Sun Hung Kai Properties Ltd (47.5%), Henderson Land Development Co Ltd (32.5%), The Hong Kong and China Gas Co Ltd (15%), Sun Chung Estate Co Ltd and the Bank of China Group (5%) in late March. The contract was worth HKD 40bn. However, the land grant was yet to be approved by the Sino-British Land Commission (Ko, 30 Mar 1996; MTRC, 1996b).
	Apr	Associated Development - Olympic	<ul style="list-style-type: none"> Package Two of Tai Kok Tsui Station was up for tender. MTRC estimated the site was worth HKD 12bn and the estimated land premium would be over HKD 2,000 per sq ft. The tender submission was due on 24 May (Ko, 3 Apr 1996; Ko, 13 Apr 1996).
	May	Associated Development - Olympic	<ul style="list-style-type: none"> Seven consortia submitted bids for Package Two of Tai Kok Tsui Station with a development cost of HKD 12bn (Quak, 25 May 1996).
	Jun	Implementation	<ul style="list-style-type: none"> An accident at the construction site of Rambler Channel Bridge killed six workers on 6 June. The Rambler Channel Bridge project could be delayed as no date had been fixed to restart the project yet. The project was originally planned to be finished in July 1997 (Lee & Wong, 10 Jun 1996).
	Jul	Associated Development - Olympic Associated Development – Kowloon	<ul style="list-style-type: none"> MTRC was considering renaming Tai Kok Tsui Station, possibly as Cherry Station. This aimed to indicate that the new station was in a planned new environment on reclaimed land in the extended district of Mong Kok (Sito, 3 July 1996). The Wing-Tai led consortium, which was responsible for the development of Package One Kowloon Station, invited banks to participate in a HKD 5.037bn loan to fund the project (Reuters News, 18 Jul 1996).

Year	Month	Type of decision/event	Key decision/event
1996		Associated Development - Tung Chung	<ul style="list-style-type: none"> Package Two of Tung Chung Station was up for tender on 31 July. Its estimated cost was HKD 7bn. The tender would close on 20 September and would be awarded in the fourth quarter of 1996. MTRC also estimated that the development cost would be about HKD 3,423 per sq ft including construction costs and land premium (Sito & Porter, 31 Jul 1996).
	Aug	Associated Development – Olympic Associated Development - Hong Kong Implementation	<ul style="list-style-type: none"> The HKD 12bn Olympic Station Package Two project was awarded to a consortium led by Sino Land Co. Ltd. and Kerry Properties Ltd. on 6 August (Sito, 6 Aug 1996; MTRC, 1996b). The master plan for a 400m tower at Hong Kong Station was initially approved by the Town Planning Board on 3 August. Some planners and surveyors expressed concerns that the proposed tower would block part of the Victoria Peak skyline (Sito, 3 Aug 1996). Construction was behind schedule on several key projects along the route. These included Tsing Yi, Hong Kong and Kowloon Stations, which were up to three months, ten weeks and six weeks behind schedule respectively, largely because of labour shortages. Five thousand imported workers were needed to ensure the project could be completed by June 1998. Meanwhile, the structural completion of Olympic Station was completed (SCMP, 11 Aug 1996).
	Sept	Associated Development - Tung Chung Associated Development - Olympic	<ul style="list-style-type: none"> Over 30 developers formed 12 consortia to bid for the HKD 7bn Package Two Tung Chung Station development after the tender submission closed on 20 September (Sito, 21 Sept 1996). MTRC asked developers to submit an 'expression of interest' for Package 3 Tai Kok Tsui Station, where MTRC planned to build a hotel. The deadline was 25 October. The contract was expected to be awarded in the second quarter of 1997 and to be completed by 2000. The development cost was estimated to be HKD 3bn (Sito, 26 Sept 1996).
	Oct	Implementation Implementation Associated Development - Kowloon	<ul style="list-style-type: none"> MTRC's chairman confirmed that the HKD 35.1bn Airport Railway project would be completed by June 1998. To date, more than half the work on the 31 major contracts had been completed (Szeto, 12 Oct 1996). Structural completion of the Western Immersed Tube Tunnel was completed (Pitman, 1996a). Following the funding request for Package One Kowloon Station development in July 1995, banks committed the five-year HKD 5.04bn loan facility under a syndicated loan agreement on 29 October (Capital Markets Report, 29 Oct 1996).
	Nov	Associated Development - Tung Chung Associated Development - Tung Chung Associated Development - Olympic	<ul style="list-style-type: none"> Tung Chung Package Two was awarded to a consortium led by HKR International Ltd. The estimated development cost was about HKD 9bn (Reuters News, 8 Nov 1996; MTRC, 1996b). On 8 November, MTRC invited bids for the HKD 11bn Package Three Tung Chung Station, planned for residential use. The tender would close on 2 December and the contract was expected to be awarded in the first quarter of 1997 (Li, 8 Nov 1996). The Sino Land-led consortium intended to raise a HKD 8bn syndicated loan for Tai Kok Tsui Station Package Two. The land premium of the project was HKD 6.11bn (Ko, 23 Nov 1996).

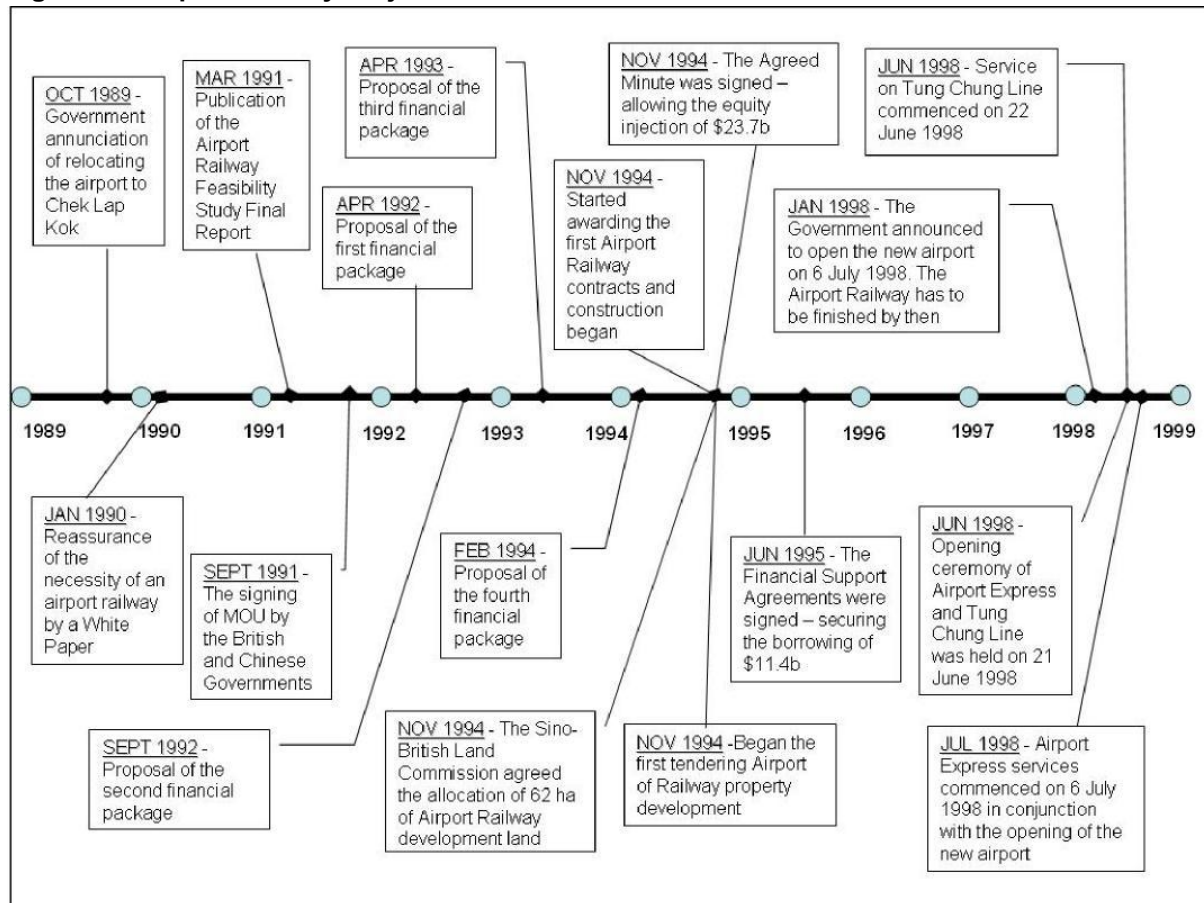
Year	Month	Type of decision/ event	Key decision/event
	Dec	Associated Development - Tung Chung Associated Development – Olympic & Hong Kong	<ul style="list-style-type: none"> Over 17 developers formed six consortia to bid for Package Three Tung Chung Station, estimated to cost HKD 11bn. There were less bids than for Package Two because small developers considered this as a bigger investment (Sito, 3 Dec 1996). Tai Kok Tsui Station was renamed as Olympic Station by MTRC (Kelly, 17 Dec 1996). Cesar Pelli & Associates and Rocco Design Ltd were chosen and appointed as the design team for the office towers on the Hong Kong Station development site (Anonymous, 1997a).
1997	Jan	Associated Development - Tsing Yi	<ul style="list-style-type: none"> The Government approved the proposal for building 12 residential blocks of 46-51 storeys at Tsing Yi property development sites (Ko, 14 Jan 1997).
	Feb	Associated Development - Tung Chung	<ul style="list-style-type: none"> The Tung Chung Station Package Three Development was awarded on 19 February (MTRC, 1997)
	Apr	Implementation	<ul style="list-style-type: none"> Construction of the rail tunnels connecting Hong Kong Station to the WIT was completed (Mackie, 1997).
	May	Associated Development - Hong Kong Associated Development - Tung Chung	<ul style="list-style-type: none"> The Town Planning Board approved the 88-storey tower designed by Cesar Pelli & Associates for the Hong Kong Station development on 9 May (MTRC, 1997). A consortium of Tung Chung Station Package Two launched a HKD 6bn loan with a maturity of four years (Reuters News, 15 May 1997).
	Jun	Implementation	<ul style="list-style-type: none"> Despite a shortage of skilled workers to fit out the mechanical and electrical equipment for the Airport Railway, MTRC's project manager, Russell Black, told LegCo that there were no plans to negotiate with contractors to accelerate the project because this would increase construction costs. Nevertheless, MTRC confirmed that the Airport Railway would be completed by June 1998 (Yau, 6 Jun 1997).
	Jul	Implementation	<ul style="list-style-type: none"> The Government urged MTRC to target the opening of the Airport Railway for April 1998 as the airport was due to open then. However, the Government refused to set a definite date for the airport opening. MTRC refused to commit itself or to speed up work unless the Government and AA set a definite date. Over 75% of the Airport Railway work was completed (Lhatoo, 31 Jul 1997).
	Sept	Associated Development- Olympic	<ul style="list-style-type: none"> The tender for Olympic Station Package Three Development was awarded to Sun Hung Kai Properties on 18 September. The development cost was estimated at HKD 3bn (Lyons, 28 Aug 1997; MTRC, 1997).
	Oct	Implementation Associated Development - Kowloon	<ul style="list-style-type: none"> The first Airport Express train was delivered to Hong Kong on 16 October (MTRC, 1997). Nine consortia formed by 30 developers submitted bids for the Package Two Kowloon Station development rights. The rights were awarded to a consortium comprising Wharf (Holdings) Ltd and Wheelock and Co Ltd. etc. (Ko, 9 Oct 1997; Reuters News, 24 Oct 1997).
	Nov	Implementation	<ul style="list-style-type: none"> The opening of the new airport was likely to be postponed to June 1998, two months late, as MTRC announced that the Airport Railway could not be opened in April 1998, prompting AA to rethink the postponement (No, 22 Nov 1997). After the

Year	Month	Type of decision/event	Key decision/event
			reassessment of the airport's opening date by the AA chairman Wong Po-yan, the airport was still planned to be opened in April even though the Airport Railway might not be ready until June. The reason was the delay of the airport would cost AA over HKD 1bn in interest on loans and loss in profit (No, 25 Nov 1997).
	Dec	Financing	<ul style="list-style-type: none"> As of 31 December, MTRC had incurred expenditure of HKD 28.858bn on the Airport Railway project; it had outstanding commitments on contracts totaling HKD 2.014bn, and had authorized further expenditure of HKD 4.228bn for works related to the project (MTRC, 1997).
1998	Jan	Implementation Associated Development - Olympic Associated Development - Kowloon	<ul style="list-style-type: none"> Followed the reassessment of the opening date for the airport in November 1997, although AA had repeatedly said the airport would be ready in April, HKSAR Government announced that the new airport would open for operation on 6 July 1998, and would be known as Hong Kong International Airport. The Government said it wanted the new airport to open with all its facilities ready. Finally, AA welcomed the Government's announcement (Yeung & Ku, 14 Jan 1998; Airport Authority, 2009b). The Town Planning Board approved a consortium led by Sino Land Co and Kerry Properties to build an extra 1,050 flats at Olympic Station property development (Sito, 10 Jan 1998). The Planning Department was considering increasing the plot ratios of some sites south of Kowloon Station from 5.5 to 6.6, to allow for a 10% increase in population in the area. They were also assessing the possibility of rezoning the 5.9 hectares into a Comprehensive Development Area for future mixed-use development (Lyons, 21 Jan 1998).
	Feb	Implementation	<ul style="list-style-type: none"> The Transport Advisory Committee discussed and objected to fare proposals for AEL and TCL. The proposed fares for AEL ranged from HKD 100 to HKD 150. But MTRC said no decisions would be made until further consultation with relevant parties. Legislators also objected to the fare proposal. MTRC argued that fares were the lowest possible allowing it to be financially self-sufficient and because the internal rate of return was set at 10% (Delfino, 25 Feb 1998; Ku, 14 Mar 1998).
		Associated Development - Hong Kong	<ul style="list-style-type: none"> Construction of the Southern Site of Hong Kong Station property development was completed with the opening of the office tower One International Finance Centre and the shopping area of IFC Mall (MTRC, 2007b).
1998	Apr	Implementation Associated Development - Kowloon Associated Development - Hong Kong	<ul style="list-style-type: none"> Olympic Station was the first of the AR stations to be completed for fitting out on 1 April (MTRC, 1998). MTRC planned to reduce the office space but increase the residential space in Packages Three to Six of Kowloon Station development, subject to Government's approval (Sito, 22 Apr 1998). MTRC gained approval for building the 90-storey (400m high) commercial tower above Hong Kong Station (Ko, 23 Apr 1998). Construction of Kowloon Station was completed (Pitman, 1997). MTRC ran test train services to the airport from 27 April (Anonymous, 1998).
	May	Associated	<ul style="list-style-type: none"> The consortium revealed that about 35% of office space in

Year	Month	Type of decision/event	Key decision/event
		Development - Hong Kong	the South West Tower of the Hong Kong Station development was committed (Ko, 20 May 1998).
	Jun	Operation Operation Operation Implementation Implementation	<ul style="list-style-type: none"> A junction point near Olympic Station of TCL was slightly damaged during a trial run in early June, but MTRC claimed it as a minor accident (Ng, 8 Jun 1998). The opening ceremony for the Airport Express and Tung Chung Line was held on 21 June (Airport Authority, 2009b) Services began on the Tung Chung Line on 22 June (MTRC, 1998). Construction of Siu Ho Wan Depot was completed (Anonymous, 1998). Hong Kong Station and the Central Subway were opened to the public on 22 June (Anonymous, 1998).
	Jul	Operation Operation Associated Development – Kowloon Operation	<ul style="list-style-type: none"> There were signal failures on the TCL line in early July (Bolcina, 2 Jul 1998). Services began on the Airport Express Line on 6 July, in conjunction with the opening of the new airport (MTRC, 1998). The Town Planning Board approved the application for a change to Packages Three and Four of Kowloon Station development. The changes included reducing the number of hotels from four to two, increasing floor areas for residential use and decreasing office floor areas (Sing Tao Daily, 18 Jul 1998). TCL and AEL's train services were disrupted due to a damaged rail crossing on 23 July (Cruz, 24 Jul 1998).
	Nov	Associated Development - Olympic	<ul style="list-style-type: none"> The programme for the pre-sale of flats at Island Harbour view, one of the Olympic Station property packages, commenced (MTRC, 1998).
	Dec	Associated Development - Hong Kong Associated Development - Kowloon	<ul style="list-style-type: none"> The 38-storey South West Tower at Hong Kong Station was renamed One International Finance Centre (Ko, 2 Dec 1998). MTRC proposed a 97-storey, 574m tower above Kowloon Station, the last of seven phases of development for the site. It required approval from Town Planning Board (Manuel, 13 Dec 1998).
1999	Apr	Associated Development - Kowloon	<ul style="list-style-type: none"> The contract for Kowloon Station Package Four was signed with the Hang Lung Group on 9 April (MTRC, 1999).
	July	Associated Development - Kowloon	<ul style="list-style-type: none"> Due to temporarily adverse market conditions, MTRC decided not to accept any of the tenders received for Kowloon Station Package Three. Subsequently, discussions were held with the Government. This led to a reduction in the land premium and MTRC made some design changes to this package to reduce the investment costs (MTRC, 1999).
	Aug	Associated Development - Kowloon	<ul style="list-style-type: none"> Package Three of Kowloon Station was postponed due to the poor bidding response in the first tender (Woo & Li, 28 Jan 2000).
	Sept	Associated Development - Tsing Yi	<ul style="list-style-type: none"> The shopping centre, Maritime Square, in Tsing Yi Station was officially opened (MTRC, 1999).
	Oct	Associated Development - Kowloon	<ul style="list-style-type: none"> The Town Planning Board approved the 102-storey tall building to be constructed at Kowloon Station (MTRC, 1999).
2000	Jan	Associated Development -	<ul style="list-style-type: none"> Package One Kowloon Station (The Waterfront) was launched at HKD 5,728 per sq ft in lump-sum payment (Woo, 14

Year	Month	Type of decision/event	Key decision/event
		Kowloon	<p>Jan 2000).</p> <ul style="list-style-type: none"> Package Three of Kowloon Station was offered to the market for tender again, at HKD 5bn. The revised land premium, originally set at HKD 2.8bn, was reduced to about HKD 2.4bn or HKD 2,300 per sq ft. Six consortia submitted bids. The tender was awarded to Sun Hung Kai Properties Ltd. on 27 January at a development cost of HKD 5bn (Woo, 14 Jan 2000; Sito, 25 Jan 2000; Woo & Li, 28 Jan 2000; MTRC, 1999).
	Mar	Associated Development – Kowloon Associated Development - Tsing Yi	<ul style="list-style-type: none"> The Buildings Department approved Wharf (Holdings) to build five residential towers of up to 74 storeys in Package Two Kowloon Station development (Woo, 7 Mar 2000). Tierra Verde, the residential development above Tsing Yi Station, was fully occupied since mid-2000 (MTRC, 2007b)
	Sept	Associated Development - Kowloon	<ul style="list-style-type: none"> Three developers submitted bids for Packages Five, Six and Seven of Kowloon Station development in early September. Sun Hung Kai Properties Ltd won the development rights for the final stages at a development cost of HKD 20bn. The land premium was HKD 5.56bn (Woo, 6 Sept 2000; Ko & Woo, 7 Sept 2000).
2003	May	Associated Development - Hong Kong	<ul style="list-style-type: none"> The construction of IFC Mall at the Northern Site of Hong Kong Station property development was completed in early 2003. The office tower, Two International Finance Centre was completed in May (MTRC, 2007b).
2005		Associated Development - Hong Kong	<ul style="list-style-type: none"> The last phase of Hong Kong Station property development, consisting of the Four Seasons Hotel and serviced apartment suites, was completed in early 2005 (MTRC, 2007b).

Figure 28: Airport Railway Project's Milestones



Project key issues

In general, the main issues for the Airport Railway centered around the financial arrangements for the project. As construction of the new airport and the Airport Railway was announced not long before the handover of Hong Kong, any issues related to the Airport Railway were inevitably politicized and discussed between the British and Chinese Governments.

The cause of the disagreement over the financial arrangements could be traced to inaccurate estimates of the costs of the new airport and Airport Railway. The costs of these two projects rose tremendously since the first cost estimate was made (LegCo, 1994c).

Regardless of the financial disputes and uncertainties, the British Government was concerned about whether the airport could be completed by July 1997. The Chinese Government, on the other hand, considered the opening of the airport after 1997 as a big advantage for them (Ren, 21 Aug 1992).

The following sections examine the stories regarding the project's financing during its inception stage, and other details such as route alignment and fares.

Political and financing issues

Initial stage and background

Before the publication of the Airport Railway Feasibility Studies, MTRC emphasized that it

would consider building the Railway only if the project was financially feasible. It was expected to be commercially unattractive because of limited passenger volumes, although Government planners urged the construction of the Railway (SCMP, 5 Apr 1990).

Unresolved disputes about the financial arrangements for the airport and the Airport Railway arose following the announcement in 1989 that the airport would be relocated. The focus of discussions was the size of Hong Kong's fiscal reserves in 1997 (i.e. how much debt the HK Government should be left with on 1 July 1997).

Whilst the design and engineering challenges of the Airport Railway were relatively straightforward, the financing of the project was complex. The Chinese Government believed the British Government was trying to drain Hong Kong's reserves and make as much money as possible out of Hong Kong before 1997. It was believed that there were many other urgent demands on Hong Kong's treasury, from sewerage to social policy, many of which were delayed or cut back due to the huge cost of the airport. China feared Hong Kong would be left servicing massive debts created by airport expenditure (Wong, 4 Jan 1990; Westlake, 7 June 1990; SCMP, 2 Sept 1992).

At the outset, it was expected that China would have expressed strong support for something so vital to Hong Kong's future prosperity; but the Chinese Government had shown a lack of enthusiasm for the new airport and its associated infrastructure. Chinese spokesmen claimed that Hong Kong would not be handed back saddled with huge debts (Wong, 4 Jan 1990; Westlake, 7 June 1990).

The Memorandum of Understanding Concerning the Construction of the New Airport in Hong Kong and Related Questions (MOU) signed between the Governments of the United Kingdom and China in September 1991 clearly stated the agreed understandings associated with the ACP projects to be fulfilled by the HK Government. Some of the terms are (HK Government, 1991a):

- The HK Government would complete the ACP projects before 30 June 1997;
- The Chinese Government would support the construction of the airport and related projects. In particular the HK Government would be free to borrow as necessary provided the total debt to be repaid after 30 June 1997 was not more than HKD 5bn. The Chinese Government would adopt a positive attitude to necessary and reasonable borrowing by the HK Government to be repaid after 30 June 1997;
- Hong Kong's fiscal reserves would not be less than HKD 25bn on 30 June 1997.

Mr Hamish Mathers, the MTRC chairman, identified some risks associated with the airport railway project, which involved high costs and unpredictable patronage. As the Airport Railway would interface with all other ACP projects, delayed completion of any of these projects would have a direct effect on the airport railway project (Lau, 19 Dec 1991).

The first financial package

In April 1992, the British Government submitted its first financial package on the Airport Railway to China. The suggested callable equity for MTRC was HKD 12.5bn in 1993 prices to be drawn down in specific adverse circumstances, including a capital cost increase of 8%; the interest rate exceeding the budget by 1.2%; no income from property developments before 1997; and a shortfall of more than 8% in rail revenue. The proposed equity injection was HKD 3.7bn in 1993 prices (Cheung, 19 Jun 1992).

In May 1992, Chinese spokesmen criticised the British side for the delay in the airport project's financing plan, which was sent on 3 April 1992, and for the lack of information on the plan's cost-effectiveness. The Chinese's prime concern, of whether Hong Kong would

inherit unnecessary financial burdens, was not yet resolved. The Chinese were also concerned about the constant changes in estimates of the project cost.

Mr Hamish Macleod, the Financial Secretary, urged China to reply on the financial plans as soon as possible, as any significant delay could cause serious consequences (Wong & Cheung, 6 May 1992).

From the legislators' point of view, legislators of UDHK expressed their concerns about problems arising from the ACP. They were concerned the escalating costs would lead to cutbacks in social services spending. Particularly in the case of Airport Railway, the Government's financial commitment to MTRC and Airport Authority had been increasing. Firstly, Government had to provide callable equity of HKD 12.9bn to MTRC. Secondly, it would have to compensate MTRC for delayed work completion. Thirdly, MTRC would have borrowed up to HKD 48bn by 1997. Moreover, HKD 12.5bn of reserve capital would be provided for MTRC. Therefore, UDHK suggested the Government should re-consider the financial arrangement and encourage more private sector participation in order to reduce its total financial commitment (LegCo, 13 May 1992).

Under MOU, the Chinese side had one month to reply to these documents (Ren, 22 May 1992). Nevertheless, the Chinese would not object to the plan as long as it could meet the principle of cost-effectiveness (Wong & Cheung, 23 May 1992).

At the meeting in June 1992, Mr Lu Ping expressed the Chinese Government's concerns. Apart from the matter of setting aside some reserves for the HKSAR, Chinese officials were unclear about the concept of 'callable equity', additional funding to be injected to MTRC and AA if required. The Chinese regarded 'callable equity' as debt. The provision of callable equity was not included in the MOU but only introduced in the airport financial plan. Another concern of the Chinese side was the insufficient private sector participation in the construction of the airport and its associated projects (Chen & Wong, 13 June 1992).

The British source said the Chinese negotiating tactics over the airport were unusual. Little progress had been made and the British complained that they did not understand why "China kept raising different and obscure points about the airport" (Free, 2 Sept 1992).

The second financial package

During the ACC meeting on 9 September 1992, Chinese officials proposed the HK Government use half the land premiums generated by the 62 hectares of airport railway property development (approximately HKD 21bn). The remainder of the land sales would go into the Land Fund for the post-1997 HKSAR Government. They urged the HK Government to increase the equity injection (direct investment) into the airport railway project (i.e. to the MTRC and AA) and to reduce callable equity. These funds should come from the HK Government but not from the post-1997 HKSAR Government. The Chinese wanted to reduce the loan burden on the AA and MTRC.

However, Chinese sources believed that the British HK Government wanted the land premiums to be part of the land sale revenue and to shift the heavy financial burden to HKSAR Government.

The current estimated cost of the railway was HKD 33.5bn at current prices (SCMP, 30 Sept 1992). The British intention was to inject HKD 3.7bn into the airport railway project and borrow the remainder, and the callable equity was proposed to be HKD 12.5bn, considered by China as debt after 1997. The Chinese thought it would be a 'bottomless pit' for the HKSAR Government, which would have to bear HKD 124bn of loans and interest by 2010 (Lau, 4 Sept 1992; Ren, 8 Sept 1992; Lau et al., 8 Sept 1992).

During the next round of talks on 17 September 1992, the British HK Government put forward its second financing package based on previous Chinese suggestions and announced the details to the public. The HK Government would inject extra equity of HKD 25bn into the AA and HKD 15bn into MTRC. This would mean the total government equity injection for the railway would increase from HKD 3.7bn to HKD 18.7bn at no cost to the HK taxpayer. This HKD 40bn would be generated from land premiums from the sale of land along the route (HKD 20bn from pre-1997 HK Government and HKD 20bn from HKSAR Land Fund). There would be no need for substantial borrowing or being left with a huge debt after 1997. In this case, the HKD 12.5bn callable equity, as suggested in the first financial package, would be eliminated whilst loans would be reduced from HKD 36bn to HKD 17bn and repaid by 2006 (Wong, 18 Sept 1992). More importantly, the Secretary for the Treasury, Mr K.Y. Yeung, stated that the sale of land would be extra revenue and would have no influence on Hong Kong's normal public spending plans (Yeung, 20 Sept 1992).

Regarding borrowing by MTRC and AA, the British wished to consider it as private borrowing instead of government loans as China had indicated. Under the MOU, if the total amount of government borrowing to be repaid after 30 June 1997 exceeded HKD 5bn, China's approval would be required (Wong & Fan, 22 May 1993).

The British proposal also suggested the 62 hectares of land grant should be excluded from the annual land disposal programme, whilst the Chinese proposed this 62 hectares of land should be included in the normal annual land sale programme of 50 hectares as stated in the Joint Declaration (Cheung, 16 Oct 1992).

According to Annex 3 of the Sino-British Joint Declaration, the "HKSAR Land Fund should not be drawn on except for the financing of land development and public works in Hong Kong". The use of the Land Fund would also require approval of the Land Commission (Cheung, 16 Sept 1992; Yeung, 20 Sept 1992). Normally, half the land premium would go into the general revenue account (pre-1997 HK Government) and half into the HKSAR Land Fund (Free, 19 Sept 1992). This implies the HKD 40bn equity injection would be shared equally between the pre-1997 and post-1997 HK Government.

The British HK Government claimed its proposal was in line with the Joint Declaration as the money was used to finance land development and public works, a legitimate use of the revenues of the HKSAR Land Fund. Pro-Chinese press, however, criticised the British on the basis that the spending of HKSAR Government's share would breach the Joint Declaration and MOU (Free, 19 Sept 1992; Wong & Wong, 19 Sept 1992).

There was no Chinese official response to the second British financial proposal, yet Chinese sources rejected the proposal for its intention to use future HKSAR Government money. They insisted that the extra capital investment should come from pre-1997 fiscal reserves instead of from HKSAR Land Fund. Moreover, the Chinese side strongly urged the HK Government to inject an extra HKD 29bn into the airport railway. Meanwhile, Mr Chris Patten criticised China for its reluctance to approve funding for the airport and Airport Railway. The British were losing patience over the deadlock (Wong, 22 Sept 1992; Law & Wong, 23 Sept 1992; SCMP, 30 Sept 1992). The Airport Committee talks on 15 October further showed the frustration of the British about why the Chinese neither provided reasons for their rejection of the revised proposals nor offered ideas of their own (Cheung, 16 Oct 1992).

In fact, the airport and its railway were used as bargaining tools in negotiations on future constitutional developments, the 1995 LegCo elections and the relationship between the Executive Council and the legislature. Although no agreements had been made between the two Governments at this point, common ground seemingly emerged, with both sides

agreeing that it was feasible to increase the investment (Wong, 26 Sept 1992).

The third financial package

Negotiations had remained stagnant since October 1992, until the British forwarded the third financial proposal to the Chinese secretly in April 1993. LegCo and the Hong Kong public were kept in the dark; the details of the proposal were not revealed. It was only known that the HK Government would bear a greater share of capital injection. Meanwhile, although dates for resuming formal talks were not yet set, a Chinese source said positive signs were seen from the Chinese Government (Wong & Fan, 22 May 1993).

MTRC's finance director, Mr Roger Moss, said MTRC could not raise public funds from the world financial markets unless China's blessing was given for the Airport Railway project. Although MTRC had a respectable credit rating and good reputation in world financial markets, the reasons for it being unable to use its enormous borrowing power "were not that MTRC could not borrow the money, or that it did not have a willing contractor, or that it did not have the expertise. The problem was HK Government did not have the political will to secure an agreement with the Chinese on the ACP financing plan" (SCMP, 26 Mar 1993b; SCMP, 27 Mar 1993).

Formal talks between the British and Chinese resumed on 4 June 1993. The Chinese side insisted the HK Government increased the level of equity injection. Still no concrete sign of agreement was seen by the end of 1993 (Wong, 30 Jun 1993; MTRC, 1993b).

According to the press, officials admitted the hold-ups would imply the Chinese "had succeeded in denying the departing British Government the glory of opening what will be the world's largest airport before the 1997 handover". The officials also explained that the idea behind HK Government's proposal to inject equity into AA and MTRC was that the users of the airport and the Airport Railway would pay for the facilities rather than the Hong Kong taxpayer (Becker, 16 Dec 1993).

MTRC's project manager, Mr Russell Black, urged the two Governments to reach an agreement. He reminded them that the primary reason for building this railway was to relieve overcrowded trains on the Nathan Road corridor, an idea which MTRC had been supporting since 1989. He also pointed out that the delay would lead to higher construction costs. In addition, delays to the Airport Railway would also delay other MTR line extensions recommended in the Rail Development Study (June 1993), which presumed the Airport Railway would be ready before other lines came on stream (SCMP, 16 Dec 1993a).

As there was no significant progress, UDHK legislators supported the idea of building the airport railway on a section-by-section basis (i.e. building the section between Central and Tsing Yi) by borrowing or making use of existing resources but without China's blessing. In this case, the railway could be ready by 1997. However, Chris Patten rejected this idea as it would not be justified in terms of transport needs (Cheung & Ball, 12 Jan 1994; Ng, 14 Jan 1994).

The fourth financial package

The HK Government proposed the fourth financial plan to the Chinese Government on 1 February 1994. About one week later, Chinese officials called for a resumption of talks with the British for the first time (AFPR, 12 Feb 1994). Before the Governments met, about ten international banks offered more than HKD 12bn to help finance the railway (Wallis, 15 Feb 1994).

Meanwhile, legislators were disappointed with the delay to the Airport Railway project and

urged the Hong Kong Government to reduce the cost of the Railway so the project might proceed as early as possible. It was also suggested that the Government should inject an additional HKD 20bn funding into the Airport Railway Fund given the abundant reserve that would be left by the end of March 1997 (LegCo, 1994b).

According to the fourth financial plan, the Government had substantially increased the total equity injection to HKD 60.3bn, with HKD 20bn coming from the sale of land along the route. Of this, HKD 36.6bn would go to AA and HKD 23.7bn to MTRC. It suggested reducing the total debt to be borrowed by MTRC and AA, from HKD 73bn in the first package put forward in 1992 to HKD 23bn. Of this, HKD 11.6bn would be for the airport to be repaid by AA in 2001 and HKD 11.4bn for the Airport Railway to be repaid by MTRC in 1997 (Wong & Cheung, 4 Mar 1994; Legco, 1994c; Yeung, 18 May 1994; Reuters News, 3 June 1994; Reuters News, 4 Nov 1994). This means the total cost of the Airport Railway is HKD 35.1bn.

Another condition was the disposal of land along the route. The British Government wanted the Chinese Government to agree on excluding the 62 hectares of land along the route from the annual land grant ceiling of 50 hectares as provided in the Sino-British Joint Declaration. This meant the land could be granted all at once, bypassing the annual review by the Sino-British Land Commission. The British even indicated that they were willing to increase the cash injection to reduce borrowing to HKD 5bn if the Chinese approved granting the land offer (Wong & Cheung, 4 Mar 1994; Cheung, 14 Mar 1994; Legco, 1994c). Yet, Guo Fengmin, Chinese JLG's representative, made clear after the talk on 20 May 1994 that the land needed to be approved by the commission as part of its annual disposal programme (Cheung & Fung, 27 May 1994).

Furthermore, the British had revised the disposal programme for the 62 hectares of land. The original plan was to dispose of 60.31 hectares of railway land before 1997 and to leave about one hectare in Central for sale after the handover in 1997. However, the latest plan (in May 1994) envisaged deferring the selling of some sites such as Central, Tai Kok Tsui and Tsing Yi until after 1997. Together with rocketing land prices for the property development, estimated up to HKD 100bn, it was expected that these would facilitate the financing deal. Notwithstanding, Chinese officials had reservations about the estimate (Wong, 10 May 1994; Yeung, 18 May 1994).

In response, the Chinese concern was about the excessive sales of airport-related land before the handover in 1997. Moreover, the Chinese insisted Britain violated the stipulation in the Memorandum of Understanding, that any debts above HKD 5bn must be agreed by China. The Chinese did not accept this proposal in April 1994 (Wong & Cheung, 4 Mar 1994; Legco, 1994c).

On the other hand, since the Chinese Government had been taking an un-cooperative attitude to financing the airport and Airport Railway, it was forcing the HK Government to inject more equity into the airport and Airport Railway projects to a certain extent. Legislators worried that this would affect the financial operations of the Government, which would have to cut other spending programmes (LegCo, 1994d).

The Sino-British talks on 20 May 1994 ended without a firm agreement and no dates were set for the next meeting, despite optimistic statements made at the end by the Chinese officials (particularly Guo Fengmin) signifying "an agreement will be reached very soon" (Reuters News, 23 May 1994; Cheung & Fung, 27 May 1994).

The talks remained deadlocked in August 1994. A source close to the Chinese negotiating team revealed the Chinese concerns. Firstly, they were worried that, if the ACP projects were not completed as scheduled in 1997, HKSAR Government would be responsible for the remaining bills. Secondly, the two Governments were still discussing the details of the

financial agreements for AA and MTRC (allocation of the HKD 23bn borrowing between the two corporations). China's stance anticipated that AA could receive a greater proportion because the airport had more potential to make profit than the railway. Thirdly, China wanted a lower average interest rate on the loans, whilst Britain considered this demand unreasonable and insisted there was no guarantee on the future direction of interest rates (Chan & Wang, 21 Aug 1994).

Moving ahead – agreements and decisions made

The JLG Airport Committee finally reached an agreement over the financing arrangements for the airport and Airport Railway in accordance with MOU. British's senior representative, Hugh Davies, and China's senior representative, Guo Fengmin, signed the 'Agreed Minute – Airport Financing' on 4 November 1994. The main points are (SCMP, 5 Nov 1994):

Arrangements for equity and debt

The HK Government would inject equity of not less than HKD 60.3bn into the airport and Airport Railway. The total borrowing for the two projects would be not more than HKD 23bn at the time of completion. Provisional Airport Authority (and AA) and MTRC would be liable for the repayment in full of such debts, which would not need to be guaranteed or repaid by the Government. The borrowing limit of HKD 23bn calmed China's concerns that the British would leave HKSAR Government with a mountain of debt.

Land for the Airport Railway

Both Governments reached a common view on the principle of the use of land for the airport and Airport Railway. Further arrangements for the grant of land would need to be agreed by the Sino-British Land Commission.

Project progress and cost monitoring and control

Both sides agreed to adopt measures to monitor and carefully control costs. ACC and Airport Committee would be responsible for cost control.

Review of progress and financing arrangements

The airport and Airport Railway would be completed to the maximum extent possible before 30 June 1997, and the other ACP projects would be completed before 30 June 1997. China and Britain would review the financing arrangements for the airport and Railway in the second half of 1996.

Contractual claims

No contracts would have indiscreet contractual-claim clauses attached. The HKSAR government would not take responsibility for any contractual claims.

Following the overall agreement between the two Governments, the Sino-British Land Commission would need to approve a land grant to the AA and MTRC. The land needed to be granted by the commission before borrowing could begin to pay for the project. On 17 November, the Sino-British Land Commission agreed the allocation of 62 hectares of Airport Railway development land. The agreement also allowed the HK Government to raise HKD 20bn from developing the land along the route to inject into the project (MTRC, 1994; Stormount, 17 Nov 1994).

LegCo approval of the agreement was also needed (Chapel, 20 May 1994). After

announcing the Agreed Minute, the Government had to convince legislators to agree on the grant of HKD 23bn. The Liberal Party opposed the one-off grant to MTRC because it would not allow legislators to monitor the progress of the project. However, the government's stance was to give more flexibility to MTRC and facilitate the start of construction works (Law, 5 Nov 1994). The Financial Secretary, Sir Hamish Macleod, confirmed that the HKD 23bn was needed within two or three months. He explained that both AA and MTRC were transparent about which annual financial reports would be published (Law and So, 7 Nov 1994). Finally, the HKD 22.9bn of equity injection (excluding the fund granted earlier) was granted on 18 November 1994 (Law, 19 Nov 1994).

The next critical stage of negotiations involved the signing of the Financial Support Agreements between Britain and China. Without the Agreements, banks would not lend the HKD 11.4bn to MTRC (Stormount, 17 Nov 1994; Ball & Wallis, 1 Dec 1994). In June 1995, the Financial Secretary, Sir Hamish Macleod, warned that funds to build the Railway would run out soon and that he was looking forward to the Agreements currently being discussed in JLG (Reuters News, 16 Jun 1995).

On 30 June 1995, China and Britain gave their full support for the injection of HK Government equity into the Airport Railway project by signing the Financial Support Agreements. The British confirmed that the Railway would be completed to the maximum extent possible by 30 June 1997. The Chinese reaffirmed that all obligations related to the projects would remain valid, recognized and protected by the HKSAR Government from 1 July 1997. The signing of the Agreements indicated that bankers could loan capital to MTRC (Kennedy & Fung, 1 Jul 1995).

Fares

In one LegCo meeting in May 1992, UDHK legislators said the public was concerned whether commuters on the existing MTR system would be made to pay for the cost of building the Railway although MTRC and the Transport Branch refuted this suggestion. UDHK legislators questioned whether this could really not be developed by analyzing MTRC's financial profile. They had requested the separation of the financial accounts of the three existing MTR lines from that of the Airport Railway line, but this request was rejected by the Government and MTRC. Nevertheless, UDHK suggested again in the LegCo meeting that the Airport Railway should not be subsidized by the existing lines (LegCo, 13 May 1992).

Route alignment

Before the release of the Airport Railway Feasibility Study, the Planning and Highways Departments each had its own preference for the TCL's alignment. Government officials would have to make a decision based on the findings of the feasibility study by the end of January 1991. The major difference was the location of the interchange station (Leung, 17 Dec 1990).

The alignment preferred by the Planning Department would cost HKD 16-20bn in construction but would presumably generate a higher and quicker return on the land development. Kwai Fong would be the interchange station for the TCL, providing development opportunities above the station. The town planners had selected this alignment with a long term view of city development in the West Kowloon Reclamation area. However, an interchange at Kwai Fong would mean passengers having to walk a long way to the station for the Tsuen Wan Line (Leung, 17 Dec 1990).

The Highways Department preferred Lai King as the interchange station, which would make the Railway cheaper and faster to build. Interchanging passengers would only have to walk over to the opposite platform. In contrast to the town planners' preference, there would be

no land development opportunity if the station was built in Lai King (Leung, 17 Dec 1990).

In 1991, the Highways Department's alignment proposal was adopted by senior Government officials. TCL's stations would be Tung Chung, Yam O and Tai O Bay or Lantau, Tsing Yi, Lai King, Tai Kok Tsui, Cheung Sha Wan (optional), Kowloon and Central (Leung et al., 10 Jul 1991).

Instead of positioning Hong Kong Station at Star Ferry Pier, it would now be located at the Exchange Square because the Railway could be extended to serve developments at Tamar and Wanchai reclamation in the future (Leung et al., 10 Jul 1991).

In May 1992, just before the formal meeting of the Airport Consultative Committee, Government officials emphasized the necessity of building the TCL and claimed it would be built regardless of the airport. As it was the most cost-effective solution to ease congestion on Nathan Road, MTRC forecast that 19,000 passengers, a quarter of the existing passengers on the Tsuen Wan Line, would use TCL. Besides, the Government had made a commitment to build the third rail crossing in the CTS-2. In addition, even if the AEL was not built, the total cost would only be reduced by 20% while total revenue would drop by 60%. In that case, the Government had to build TCL with its own funding, which in turn taxpayers would have to pay for (Yue & Cheung, 19 May 1992).

Property development

On 3 March 1995, the Government set land premiums of HKD 2,350 per sq ft for one of two sites in Tai Kok Tsui Package One development and HKD 1,000 per sq ft for two of the five plots in Tung Chung Package One. However, developers were not notified about the exact land premiums when they were asked to tender for the sites. Two consortiums led by Cheung Kong (Holdings) and Sino Land were believed to be leading the race for the property developments along Tung Chung and Olympic Station. Other developers were less competitive due to the high land-premium payments. In particular, the Cheung Kong-led consortium said they had included an escape clause in the tender if the Government set the land premium charges too high. It was believed that MTRC was negotiating with the Government to change the policy on calculating land premiums and to lower the required payments for the sites. However, the Director of Lands Department said the Government had no plans to change the policy (Sito & Porter, 3 Mar 1995).

Later, on 16 March 1995, the Government said it was willing to reduce the land premiums by approximately 10%. In other words, the payment for the Tai Kok Tsui Package One development and Tung Chung Package One development were reduced to HKD 2,100 per sq ft and HKD 900 per sq ft respectively. Some potential bidders, which had withdrawn from the tenders, said the deal was still not attractive (SCMP, 16 Mar 1995).

The Government further reduced the land premium for the Tai Kok Tsui Package One development to HKD 1,800 per sq ft, a week after the previous change (Porter, 28 Mar 1995).

The government set the land premium for the second site of Tung Chung station development, which consists of three small plots. The payments were about HKD 780 per sq ft for retail space and HKD 910 per sq ft for office and hotel space (Sito, 29 Mar 1995).

The land premium for Tsing Yi Station development was set at HKD 1,900 per sq ft. Developers responded that it was too expensive compared to that of Tung Chung and Tai Kok Tsui Stations (Sing Tao Daily, 12 Jul 1995). The Lands Department later reduced it to about HKD 1,300 per sq ft (or HKD 4bn) while MTRC was short-listing the bids in September 1995 (Sito, 22 Sept 1995).

Environmental issues

MTRC promised the ACE to set up a number of measures to reduce noise and dust during the construction stage (especially in areas around Lai King). These included temporary barriers and enclosures, and to restrict working hours so as to control the noise within a 70-decibel limit. Dust would be controlled by keeping concrete-batching plants away from the population and blasting only under favourable weather conditions. Nevertheless, ACE also wanted the Kwai Tsing District Board to be satisfied before any work commenced (Griffin, 1 Feb 1994).

E PROJECT FUNDING/FINANCE

Introduction

Under the 1991 Sino-British agreement and MOU, the new airport and its associated infrastructure are due to be completed before June 1997. The financing arrangements for the Airport Railway relate to obligations on the HK Government straddling 1997, and were being discussed with the Chinese side in the Airport Committee under the Joint Liaison Group. The details of the financial package had also to be approved by LegCo's Finance Committee (MTRC, 1993a).

However, China rejected four financing plans offered by the British/HK Government, in April 1992, September 1992, April 1993 and February 1994. They argued the plans would leave a huge debt to HKSAR government after the handover. In particular, the amount of borrowing by MTRC to run the Airport Railway was at the centre of the dispute.

In short, financing for the Airport Railway was mainly from the Government through equity injection (i.e. borrowing by MTRC), loans from banks and revenues generated from property developments along the Airport Railway.

Background to funding/financing

There were 'four pillars' underpinning the financing of the Airport Railway:

- injection of initial equity by the shareholder;
- deferral of dividend payments on previous investments to the shareholder;
- profits from railway-related property developments; and
- borrowing from the financial markets.

As mentioned, the HK Government was the main contributor to the financing of the project. The Government had sufficient fiscal reserves to cover its share of the project's costs, but was reluctant to commit these and preferred raising loans. Disputes over the division between debt and equity were at the heart of the negotiations between Britain and China, in which China hoped to reduce government borrowing.

Profit from property development was also a major source of finance for the Airport Railway. MTRC negotiated a private treaty grant with the HK Government to buy development sites above the Airport Railway stations at commercial valuation prices. The MTRC then developed the sites as a joint venture with private developers. Consequently, it enjoys a share of the development profit which was used to finance the railway (Budge Reid; 1999).

Overview of key stages in funding/financing approach

Since 1992, several financial packages were offered to China. The financial packages of the Airport Railway were often discussed together with that of the airport. The British revised each of them hoping to satisfy China's needs and minimise their fear of leaving a huge debt to Hong Kong after 1997. The key elements of these financial plans included debts, equity injection and land premium from property developments. A summary of equity injection to AA and MTRC is illustrated in Table 10 and the details of the four financial proposals are discussed in 'Political and financing issues'.

Table 10: Summary of equity injection in financial packages (in HKD bn)

	First Package April 1992		Second Package September 1992		Third Package April 1993	Fourth Package February 1994	
	Equity	Debt	Equity	Debt	/	Equity	Debt
AA	16.6		21.3		unknown	36.6	11.6
MTRC	3.7*	36	18.7	17	unknown	23.7	11.4
Total	20.3		40			60.3	23

* plus HKD 12.5bn of callable equity.

Source: Chapel, 20 May 1994; Wong, 18 Sept 1992; Reuters News, 3 Jun 1994, Reuters News, 4 Nov 1994

Following negotiations between the two Governments and the proposal of four financial packages, there were three main stages to secure financing for the Airport Railway. The following paragraphs describe these stages.

The fourth financial package proposed in February 1994 became the backbone for the Agreed Minute in November 1994 and the Financial Support Agreements signed by the HK Government and MTRC in late June 1995. To be precise, the Agreed Minute was required for MTRC to award and sign contracts with the contractors in order to initiate the construction of the Railway. This also allowed MTRC to borrow the HKD 23.7bn equity injection from the Government. Following the signing of the Agreed Minute, LegCo's Finance Committee also approved the financing arrangements as set out in the Agreed Minute (Law, 19 Nov 1994; Kennedy & Fung, 1 Jul 1995).

The Financial Support Agreements also included fiscal arrangements such as loan amounts, repayment periods and guarantees. These are required by both AA and MTRC to enable them to negotiate loans with international banks and financial institutions. Without them, the banks would not lend the HKD 11.4bn required for the project (Fluendy, 5 Nov 1994; Stormount, 17 Nov 1994; Ball & Wallis, 1 Dec 1994).

In brief, the Agreements stated that the Government would inject equity of HKD 23.7bn and the total borrowing in respect of the project at completion would not be more than HKD 11.4bn. If the project costs exceeded HKD 35.1bn, the Government would provide further financial support. To be precise, the debt element of financing would be provided within MTRC's external debt financing program (MTRC, 1994; MTRC, 1995b).

Funding sources

Apart from obtaining funding from the HK Government, Table 11 shows a list of banks and financial institutions from which the MTRC obtained loans or other forms of financial support. More than 170 institutions were involved in funding the project.

Table 11: List of financial institutions

ABN Amro Bank N.V.	Aichi Bank Limited
ANZ Banking Group Limited	Asahi Bank, Limited
Asian Development Bank	Banca Commerciale Italiana
Banco di Napoli	Banco di Roma S.P.A.
Banco Exterior de Espana	Banco Santander
Bank Austria	Bank of America NT & SA
Bank of China	Bank of Communications

Bank of East Asia, Limited	Bank of Fukuoka Limited
Bank of Ireland	Bank of Kinki Limited
Bank of New Zealand	Bank of Tokyo, Limited
Bank of Yokohama, Limited	Bankers Trust Company
Banque et Caisse d'Epargne de L'etat	Banque Indosuez
Banque Nationale de Paris	Banque Paribas
Barclays Bank PLC	Bayerische Landesbank Girozentrale
Bayerische Vereinsbank A.G.	Canadian Imperial Bank of Commerce
Cariplo	CCIC Finance Limited
Chase Manhattan Bank, N.A.	Chemical Bank
China Development Finance Company (Hong Kong) Limited	Chuo Securities Company Limited
Chuo Trust and Banking Company, Limited	Citibank, N.A.
Commerzbank Aktiengesellschaft	Cosmo Securities Company, Limited
Credit Agricole	Credit Italiano
Credit Lyonnais	Credit Suisse
Creditanstalt — Bankverein	CS First Boston (Japan) Limited
CTB Australia Limited	Dah Sing Bank, Limited
Dai-Ichi Kangyo Bank, Limited	Dai-Ichi Securities Company Limited
Dainana Securities Company Limited	Daishi Bank, Limited
Daito Securities Company Limited	Daiwa Bank, Limited
Daiwa Securities Company Limited	Dao Heng Bank Limited
DB Capital Markets (Asia) Limited	Den Danske Bank
Deutsche Bank AG	Development Bank of Singapore, Limited
DG Bank	Diamond Lease (Hong Kong) Limited
Dresdner Bank AG	Ehime Bank, Limited
First Boston (Japan) Limited	Fuji Bank, Limited
Fukutoku Bank, Limited	Generale Bank Overseas (Belgian Bank)
Girocredit Bank	Goldman, Sachs and Company
Hachijuni Bank, Limited	Hang Seng Bank Limited
Hokkaido Takushoku Bank Limited	Hongkong and Shanghai Banking Corporation Limited
Hongkong Chinese Bank, Limited	Hyakugo Bank Limited
Hyakujushi Bank, Limited	Ichiyoshi Securities Company Limited
Industrial Bank of Japan, Limited	Internationale Nederlanden Bank
Itogin Securities Company Limited	Izumi Securities Company Limited
Japan Cosmo Securities (Hong Kong) Limited	Jardine Fleming and Company Limited
Juroku Bank Limited	Ka Wah Bank Limited
Kaisei Securities Company Limited	Kankaku Securities (Asia) Limited
KDB Asia Limited	Kleinwort, Benson International Incorporation
Kokusai Securities Company, Limited	Kosei Securities Company Limited
Kwong On Bank, Limited	Kyokuto Securities Company Limited
Lehman Commercial Paper Incorporation	Lippo Asia Limited
Long-Term Credit Bank of Japan, Limited	Malayan Banking Berhad
Maruman Securities Company Limited	Marusan Securities Company Limited
Maruso Securities Company Limited	Meiko Securities Company Limited
Merrill Lynch International Limited	Mito Securities Company Limited

Mitsubishi Bank, Limited	Mitsubishi Trust and Banking Corporation
Mitsui Trust and Banking Company, Limited	Morgan Guaranty Trust Company of New York
Morgan Stanley Capital Services Incorporation	Naigai Securities Company Limited
Nanyang Commercial Bank, Limited	National Securities Company Limited
National Westminster Bank PLC	New Japan Securities Company Limited
Nichiei Securities Company Limited	Nikko Securities Company, Limited
Nippon Credit Bank, Limited	Nippon Kangyo Kakumaru Securities Company Limited
Nishi-Nippon Bank Limited	Nomura Securities Company, Limited
Norinchukin Bank	Oakreed Financial Services Limited
Ogaki Kyoritsu Bank, Limited	Okasan Securities Company Limited
Overseas Trust Bank Limited	Overseas-Chinese Banking Corporation Limited
Prager, McCarthy and Sealy	Rabobank Nederland
Royal Bank of Canada	Royal Bank of Scotland PLC
Sakura Bank, Limited	Salomon Brothers Asia Limited
San-in Godo Bank Limited	Sanwa Bank, Limited
Sanyo Securities Company Limited	Schroders Asia Limited
Security Pacific Asian Bank Limited	Senshu Bank, Limited
S G Warburg Securities	Shinyei Ishino Securities Company Limited
Siam Commercial Bank Limited	Skandinaviska Enskilda Banken
Smith Barney, Harris Upham International Incorporation	Societe Generale
Standard Chartered Bank PLC	Sumitomo Bank Limited
Sumitomo Trust and Banking Company, Limited	Swiss Bank Corporation
Taiheiyo Securities Company Limited	Taikagi Securities Company Limited
Takinogawa Shinyo Bank	Tokai Bank, Limited
Tokuyo City Bank, Limited	Tokyo Securities Company Limited
Towa Securities Company Limited	Toyo Securities Company, Limited
Toyo Trust and Banking Company, Limited	Unibank A.S.
Union Bank of Switzerland	Universal Securities Company Limited
Wakkanai Shinkin Bank	Wako Securities Company Limited
Wardley Limited	Westdeutsche Landesbank Girozentrale
Westpac Banking Corporation	Wing Lung Bank Limited
World Securities Company, Limited	Yamaguchi Bank Limited
Yamaichi Securities Company, Limited	Yamatane Securities Company, Limited
Yasuda Trust and Banking Company, Limited	Zenshinren Bank

Source: LegCo (1994b)

Main elements and structure of financing package

The project was financed by equity and debt, totaling HKD 35.1bn. The detailed financing of the project was set out in the Financial Support Agreements on 30 June 1995 (Kennedy & Fung, 1 Jul 1995). The project has an internal rate of return of around 10% over a 40-year period (MTRC, 1994).

Equity

The estimated amount of equity was changed many times during the discussion of the financial arrangements. In the end, the equity provided was HKD 23.7bn from the sole shareholder, the HK Government. Equity would be fully drawn in tranches before June 1997 (MTRC, 1995).

Debt

This refers to 'callable equity' or 'contingent liabilities', that is deferred dividend income given in property development rights (To, 14 Jun 1992; Chen & Wong, 13 Jun 1992).

The total external borrowing applicable to the financing of the Railway would not be more than HKD 11.4bn. The total capitalized cost of the project would include capitalized interest applicable to borrowing in respect of the project and would not be more than HKD 35.1bn. If the capitalized cost was forecast to be greater than HKD 35.1bn, MTRC would seek, and the HK Government would be obliged to provide, additional financial support in the form of equity. It was not anticipated that such a request would be made, having regard to the advanced state of tender review and contract award (MTRC, 1995).

The project would not be cross-subsidised by the existing operation (MTRC, 1995).

In regard to loans from banks, MTRC signed its first syndicated loan facility agreement of HKD 6bn on 7 September 1995. "The facility has a seven-year final maturity and will be available for drawing on a revolving basis during the first 35 months. Repayments will be made in nine semi-annual installments commencing from the third anniversary". There were six arranging banks including the Hong Kong Branch of the Bank of China, Hong Kong and Shanghai Banking Corp, Fuji Bank, Industrial Bank of Japan (HK Branch), JP Morgan Securities Asia and Paribas Asia. Bank of China and Hongkong Bank acted as joint book runners for the transaction while IBJ would be the facility agent. Forty-one other banks also joined the deal (Reuters News, 7 Sept 1995).

Revenue

Revenue from the Railway consists of fare revenue from passengers, income generated from commercial activities at railway stations, and the useful recurrent estate management income contributed from completed property developments along the lines (MTRC, 1995). As the financial account and fare revenue account of the AEL are separated from the other MTR lines, it is not possible to extract figures for TCL and therefore, this report only illustrates the figures for AEL.

Fare revenue

MTRC expected the Railway to achieve net profit after interest charges in its early years of operation after receiving its share of profits from the property developments along the railway (MTRC, 1995). According to Government's estimates in May 1992, MTRC would generate HKD 0.71bn at prices from the Railway in the first year of operation. As patronage grew, Government expected revenue would jump to HKD 1bn in 2001 (Yue & Cheung, 19 May 1992).

The fare revenue of Airport Express was HKD 0.673bn in 2008, which accounts for 5.9% of the total fare revenue of MTR Lines. The average fare per passenger for Airport Express in 2008 was HKD 63.47 (MTRC, 2008). In general, the fare revenue has been increasing since 1998. The actual and estimated fare revenue of Airport Express is summarized in Table 12.

Table 12: Fare revenue of Airport Express Line

Year	Fare revenue per passenger in HKD	Annual fare revenue in HKD m	Estimated annual fare revenue in HKD m*
1998	18.52	212	429 **
1999	42.8	445	-
2000	53.1	549	-
2001	62.5	564	658 **
2002	65.43	553	-
2003	62.07	425	-
2004	64.25	515	-
2005	66.09	561	-
2006	63.85	611	933** / 653 ***
2007	64.34	655	-
2008	63.47	673	-

* revenues are at 1990 prices

** forecasted without Green Island Link to Lantau

*** forecasted with Green Island Link to Lantau which was planned to in-placed in 2006

Source: Freeman Fox Maunsell (1991a); MTRC (1998-2008)

Property development revenue

As mentioned earlier, five sites along the Railway have been identified for property development; Hong Kong Central, Kowloon, Olympic (Tai Kok Tsui), Tsing Yi and Tung Chung.

MTRC's share of profits from these sites (after all costs including market rate land premium payment to Government) would be used to assist servicing the debt for some of the construction costs of the project. It was estimated MTRC's share of profit would be HKD 3.4bn in 1991 prices (MTRC, 1993a).

According to the Transport Branch estimation in 1992, MTRC would generate profits from property development in 1996 where the estimated yields were HKD 0.6bn. The amount would increase to HKD 1.7bn in 1997, drop to HKD 0.45bn in 1998, and then peak at HKD 3bn in 1999 (Lau et al., 8 Sept 1992).

Based on March 1991 property prices, the five developments would generate HKD 42.5bn of land premiums, which would be reinvested in the Railway. It was later estimated, in May 1994, that the land premium would reach almost HKD 100bn due to the booming property market. The normal proportion of this would be payable into the HKSAR Land Fund. The premium would be paid by private property developers in joint venture partnership with MTRC. In addition, their borrowing would not require guarantees from the Government (MTRC, 1993a; Yeung, 18 May 1994).

The Government expects the costs to be reimbursed by property developers in the form of up-front cash payments when development packages are awarded. In accordance with the development agreements entered into with property developers, it is the responsibility of developers to balance development costs. Furthermore, costs of foundations, site enabling works and land costs incurred by MTRC are capitalized as property development in progress. Payments received from developers are credited to property development in progress to offset costs incurred in respect of the same development. In cases where payments received from developers exceed the related expenditure incurred by MTRC, such excess is recorded as 'deferred income' (Note A). In these cases, any subsequent

expenditure incurred by MTRC in respect of that development will be charged against deferred income. Deferred income is to be recognised as MTRC profits at the appropriate time after charging any remaining costs related to foundation and site enabling works, and after taking into account the outstanding risks and obligations retained by MTRC relating to each development. Until such time as deferred income is recognised as profit, it is recorded as a liability of MTRC in recognition of MTRC's obligations under the Land Grant (MTRC, 2008) (Table 13).

Table 13: Airport Railway property development in progress and deferred income on airport railway property development (in HKD m)

	Expenditure	Offset against payments received from developers	Payments received from developers	Offset against development in progress * (note A)
1996	780	(2,072)	10,119	(2,072)
1997	979	(1,490)	9,445	(1,490)
1998	1,810	(698)	-	698
1999	424	(547)	613	547
2000	159	(1,322)	1,320	(1,322)
2001	51	(102)	225	(102)
2002	76	(62)	425	(62)
2003	122	(63)	50	(63)
2004	116	(39)	132	(39)
2005	210	(152)	956	(152)
2006	106	(106)	20	(106)
2007	139	(139)	120	(139)
2008	31	(31)	-	(31)

It that is the deferred income on upfront payments

Source: MTRC (1997, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007c, and 2008)

F OPERATIONS

Traffic forecasts to the airport by type and mode

Several studies were undertaken to assess the need for and importance of the Airport Railway. Apparently these studies valued it highly.

According to PADS (Lands and Works Branch, 1989), the proportion of air passengers assumed to use the railway were 50% on Airport Express Line (the 'dedicated' rail), 20% on Tung Chung Line (the 'public' rail) and 55% on 'combined' rail services to the airport. Table 14 shows projected traffic to the airport by different modes of transport in two scenarios, with and without the Airport Railway services.

Table 14: Traffic by type and mode to the airport with and without railway

Traffic by type and mode (during airport peak hour (SBR))*	Number of passengers	
	With Railway	Without Railway
<i>Air Passengers</i>		
• Terminating Air Passengers (Arriving + Departing)	9,986	9,986
• Car Vehicle Trips	1,524	1,824
• Taxi Vehicle Trips	2,701	4,672
• Bus Passenger Trips	240	2,394
• Rail Passenger Trips	6,591	-
• Hotel Car/ Bus Vehicle Trips	301	974
• Tour Coach Vehicle Trips	141	328
<i>Airport Employees/ Services</i>		
• Car Vehicle Trips	102	135
• Taxi Vehicle Trips	111	126
• Bus Passenger Trips	490	2,687
• Rail Passenger Trips	2,316	-
• Special Purpose Bus Vehicle Trips	30	35

* Airport Peak Hour (SBR) is Standard Busy Rate, and refers to the hour with the peak air passenger movements, which is forecast to be between 2pm to 3pm.

Source: Lands and Works Branch (1989)

According to the July 1991 estimates, if the railway was deferred, road traffic would increase by up to 1,170 private cars an hour in 1997 and 1,650 in 2001. A total of 1,670 extra taxis and hotel vehicles would also be needed to replace the rail service (HKS, 18 Jul 1991). On the other hand, at least another 290 buses and 700 taxis would be needed if the Airport Express was not built (Lau & Cheung, 8 Apr 1992).

In market research surveys at Kai Tak Airport, 40-50% of passengers said they would use the Airport Express, 40-50% said they might, and less than 15% said they would definitely not use it. The result indicated that an airport railway was essential in order to attract passengers (Freeman Fox Maunsell, 1991a).

Passenger volume

Expected passenger volume

The forecasts of passenger volume for the Airport Express have changed over the years because they have been based on different assumptions and data at different periods. Generally, the AEL transport model was specifically designed and was based on research into existing airline passenger characteristics and demands, and international experience (Freeman Fox Maunsell, 1991a).

Prior to any feasibility studies, a forecast of 120,000 passengers per day and 80 million passengers per year by 2010 was based on the presumption that the railway would carry 55% of the airport traffic (Stoner, 15 July 1990). Following publication of the feasibility studies in 1991, 37,500 passengers per day were expected in 1997, rising to 94,300 passengers by 2011 (Freeman Fox Maunsell, 1991a). In 1993, about 39,000 passengers per day were expected on a busy day when full service commenced in 1998. The number was anticipated to rise to 75,000 passengers per day by 2011 (MTRC, 1993a). According to the forecast made a year before the Railway was opened, the estimated weekday passengers at initial opening in 1998 reduced from 39,000 passengers, as forecast in 1996, to 36,000 passengers as forecast in 1997 (MTRC, 1997). Yet, it was expected to increase to 82,000 passengers per day by 2011, an estimated 7,000 more passengers than forecast in 1993 (MTRC, 1997).

Table 15 summarizes the patronage forecasts.

Table 15: Estimated average patronage of Airport Express per day

	Operation in 1997/8 (in the initial opening of Airport Express) It	Operation in 2011 It
Forecasted in 1989/1990	120,000	8 million annually in 2010
Forecasted in 1991	37,500	94,300 * / 89,900 **
Forecasted in 1993	39,000	75,000
Forecasted in 1997	36,000	82,000

* Forecasted without Green Island Link to Lantau

** Forecasted with Green Island Link to Lantau

It unit in passengers

Source: Stoner, 15 July 1990; Freeman Fox Maunsell (1991a); MTRC (1993a); MTRC (1997)

Actual passenger volume

There was a substantial difference in the number of passengers per day when the service was initially opened in 1998. Referring to Table 15, the average number of passengers per day in 1998 was 22,000. The MTRC Annual Report 1998 claimed that the low number of passengers was due to the poor performance of the economy and a decline in tourist arrivals (MTRC, 1998). Nevertheless in 2008, there were only 29,000 passengers per day on average. In fact, the average daily number of passengers has never reached the estimated 36,000 since the project's completion in 1998. However, the total number of passengers has been growing gradually since 1998, despite the significant decrease in 2003 when SARS hit Hong Kong and substantially influenced Hong Kong's tourism. The continued increase in the passenger volumes of Airport Express since 2005 is possibly due to the opening of AsiaWorld-Expo in 2005 and the increasing number of events held there (MTRC, 2000; MTRC 2008).

Furthermore, only an average of 25% of passengers traveling to/from the airport used the

Airport Express rather than other modes of transport from 1998 to 2006. This was significantly different from the forecast undertaken in 1990, in which the overall modal share of AEL was forecast by the Government to be 55% of passengers (HK Standard, 18 Jul 1991) (Table 16). Figure 29 shows the different modes of public transport designated at the airport.

Figure 29: Different modes of transport to Hong Kong International Airport



Source: Airport Authority (2009a)

Table 16: The actual patronage of Airport Express Line

Year	Total number of passengers (000s)	Average no. of passengers per day (000s)	Average car occupancy	Proportion of air travellers using Airport Express (%)
1998	3,928 **	22	14	25 (34 ^{***})
1999	10,396	29	16	32
2000	10,350	28	16	28
2001	9,024	25	14	27 (45 ^{***})
2002	8,456	23	13	25
2003	6,849	19	13	23
2004	8,014	22	15	21
2005	8,492	23	15	22
2006	9,577	26	14	23 (52 ^{***})
2007	10,175	28	15	-
2008	10,601	29	16	-
2009 *	5,552	-	-	-

* Figures from January 2009 to July 2009

** Figures from the opening of Airport Express, i.e. 6 July 1998

*** Estimated in the Airport Railway Feasibility Study Final Report 1991

Source: Freeman Fox Maunsell (1991a); MTRC (2000-2006, 2007c, 2008 & 2009b)

Concluding from the preceding sections, the expected and actual average number of passengers taking the Airport Express per day and modal shares for air passengers' travel to and from the airport varies. The number has been over-estimated, possibly due to inaccurate assumptions about air passenger throughput at Hong Kong International Airport.

Fares

The one way adult fares for traveling to the airport at 1990 prices from Hong Kong Central, Kowloon and Tsing Yi were forecasted as HKD 50, HKD 40, HKD 20 in 1990 prices respectively (Freeman Fox Maunsell, 1991a; MTRC, 1993a). In March 1995, the ticket price from Central to the airport was estimated to be between HKD 70 and HKD 80 in 1998 prices (SCMP, 24 Mar 1995). MTRC proposed fares ranging from HKD 100 to HKD 150 in February 1998 (Delfino, 25 Feb 1998).

Today, single journey fares for an adult from Hong Kong Central, Kowloon and Tsing Yi are HKD 100, HKD 90 and HKD 60 respectively (MTRC, 2009d). Occasionally, special promotions are offered to increase ridership on the Airport Express.

Service performance

Airport Express service delivery, percentage of passenger journeys on time and train punctuality were 99.9% (MTRC, 2008). The original service frequency of Airport Express was proposed to be at four to ten minute intervals; yet the current service frequency is 12 minute per train (Freeman Fox Maunsell, 1991a).

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