PROJECT PROFILE

HONG KONG

KCRC West Rail

omega centre

Centre for Mega Projects in Transport and Development

A global Centre of Excellence in Future Urban Transport sponsored by Volvo Research and Educational Foundations (VREF) This report was compiled by the The University of Hong Kong, Hong Kong.

Please Note: This Project Profile has been prepared as part of the ongoing OMEGA Centre of Excellence work on Mega Urban Transport Projects. The information presented in the Profile is essentially a 'work in progress' and will be updated/amended as necessary as work proceeds. Readers are therefore advised to periodically check for any updates or revisions.

The Centre and its collaborators/partners have obtained data from sources believed to be reliable and have made every reasonable effort to ensure its accuracy. However, the Centre and its collaborators/partners cannot assume responsibility for errors and omissions in the data nor in the documentation accompanying them.

CONTENTS

Figures Tables Abbreviations

A INTRODUCTION

Type of project Country/location Current status

B BACKGROUND TO PROJECT

Principal project objectives Key enabling mechanisms and decision to proceed Main organisations involved

- Kowloon-Canton Railway Corporation (KCRC)
- Main government bodies
- Consultants and contractors
- Other stakeholders

Planning and environmental regime

• Outline of planning regime

• Environmental issues and ecological mitigation Land acquisition

C PRINCIPAL PROJECT CHARACTERISTICS

Route description Main termini and intermediate stations

- Introduction
- Nam Cheong Station
- Mei Foo Station
- Tsuen Wan West Station
- Kam Sheung Road Station
- Yuen Long Station
- Long Ping Station
- Tin Shui Wai Station
- Siu Hong Station
- Tuen Mun Station

Project costs

Project programme Main engineering features Main contracts and contractors Major civil engineering components

- Tai Lam Tunnel (DB-350)
- Kwai Tsing Tunnels (DB-320)
- Mei Foo to Nam Cheong Tunnels (CC-403)
- The Viaducts (CC-201 and CC-211)

D PROJECT TIMELINE

Project timeline

Project key issues

- Contract agreements, tendering and financing
- Staffing issue: KCRC vs. outside consultants
- The return of sovereignty of Hong Kong to China: 1997 (British Hong Kong Government vs. Chinese Hong Kong SAR Government?)

E PROJECT FUNDING/ FINANCE

Introduction Background to funding/ financing Overview of key stages in funding/financing approach Funding source Main elements/structure of financing package

- Government equity injection
- Note issurance programme
- KCRC internal funds

F OPERATIONS

Ridership Commentary on ridership

G BIBLIOGRAPHY

List of figures

Figure 1: Existing Rail Lines in Hong Kong	2
Figure 2: West Rail Line Alignment	2
Figure 3: Satellite Image of West Rail Line alignment	3
Figure 4: The Organisation Structure of KCRC (2009)	5
Figure 5: Annual expenditure and cumulative total cost for West Rail Project Phase 1	18
Figure 6: Annual project cost for West Rail Phase I	19
Figure 7: West Rail Master Programme Summary	20
Figure 8: Map of the North West New Territories Rail Links	26
Figure 9: West Rail Project Phase I Milestones	43

List of tables

Table 1: The consultancies for technical studies (later retendered in November 1996)	. 6
Table 2: The consultancies for technical studies (after retendering in November 1996)	. 6
Table 3: Detailed design contractors	. 6
Table 4: Civil construction contractors	. 6
Table 5: Railway Systems Contractors	. 7
Table 6: Summary of KCRC West Rail Property Developments	16
Table 7: Comparision between estimated total cost in 1998, 1999 and 2001 with the actual cost completion in 2003	at 17
Table 8: Comparison between estimated annual expenditure and the actual annual project cost 200 2003 (estimated in 2001)	1- 18
Table 9: Milestones for achieving primary programme objectiveTable 9.	20
Table 10: West Rail engineering and construction features overview	21
Table 11: Major contracts and contractors (by May 2003)	22
Table 12: West Rail Project Agreement: Financing West Rail – Clauses Explanation	47
Table 13: A summary of West Rail funding sources	48
Table 14: Average daily patronage for West Rail (2004-2007)	50

Abbreviations

CEO	Chief Executive Officer					
CTS-2	The Second Comprehensive Transport Study					
EPBM	Earth Pressure Balanced Tunnel Boring Machine					
EY	Ernst & Young					
HKSAR	Hong Kong Special Administrative Region					
HK	Hong Kong					
KCRC	Kowloon-Canton Railway Corporation					
LEGCO	Legislative Council					
LRT	Light Transit Rail (Light Rail)					
MTRCL	Mass Transit Railway Corporation Limited					
MTRC	Mass Transit Railway Corporation					
NWNT	North West New Territories					
ONL	Optical Network Limited					
OZP	Outline Zoning Plan					
PTI	Public Transport Interchange					
RDS	Railway Development Strategy					
SAR	Special Administrative Region					
TBM	Tunnel Boring Machine					

A INTRODUCTION

Type of project

The KCRC West Rail (Western Corridor Railway Phase I, or West Rail Phase I) is a 30.5km intra-urban passenger railway in Hong Kong, linking up the urban area of West Kowloon with the new towns in the Northwest New Territories. It is one of the three proposed services of the Western Corridor mentioned in Railway Development Strategy in 1994 (the first comprehensive railway development strategy of Hong Kong), as a sub-regional passenger service (Transport Branch, 1994:3). The concept of the Western Corridor is based on the proposal of a North West New Territories Urban Link in the Hong Kong Second Comprehensive Transport Study (CTS-2) in 1989, in which four alternative routes were considered to link up the existing towns of Tuen Mun, Yuen Long and a developing new town at that time, Tin Shui Wai, in the Northwest New Territories with the main urban area by rail (Transport Department, 1989).

West Rail comprises of a viaduct (13.4km/44%), an open surface alignment (2.4km/8%), a bored tunnel (9km/30%), a cut-and-cover tunnel (2.5km/8%) and an enclosed structure at grade (3.2km/10%). Of a total of nine stations, two are interchanges with other MTR lines (Mei Foo for the Tsuen Wan Line; Nam Cheong for the Tung Chung Line) which were designed to integrate the KCRC West Rail into the metro network of Hong Kong. There are also four interchanges (Yuen Long, Tin Shui Wai, Siu Hong and Tuen Mun) with Light Rail in the North West New Territories in order to enlarge the catchment area of the West Rail service into the new towns (Anonymous, 1999b).

There are nine potential sites for associated property development along West Rail, which is equivalent to 3,330,000m² and 40,000 units (Anonymous, 1999b). Most of these sites are situated along the railway line or on top of the West Rail stations at podium level.

Country/location

The West Rail is located in West Kowloon and North West New Territories, HONG KONG SAR, CHINA. The West Rail passes through Shum Shui Po, Kwai Tsing and Tsuen Wan Districts in Kowloon, and Yuen Long and Tuen Mun Districts in the New Territories.



Figure 1: Existing Rail Lines in Hong Kong

Source: Highways Department (2009)





Source: Highways Department (2009)

Figure 3: Satellite Image of West Rail Line alignment



Source: Modified from Google (2009)

Current status

The KCRC West Rail commenced service on 20 December 2003. On 2 December 2007, KCRC merged with Mass Transit Railway Corporation Limited (MTRCL), which was running the majority of the rapid transit railway lines in Hong Kong (MTRC, 2008). All railway services in Hong Kong since then have been operated by MTRCL, and the KCRC West Rail has been renamed the MTR West Rail Line.

Some construction works for the property development along the West Rail have been commenced, but so far none has been completed. Tuen Mun will be the first West Rail property development to be completed, and is expected to be completed by 2013 (MTRC, 2009).

B BACKGROUND TO PROJECT

Principal project objectives

According to the Railway Development Strategy (Transport Branch, 1994), the main objective for West Rail is based on the projection of the population increase of the Western New Territories to about 900,000 by 2001, which in turns would generate some 600,000 public transport trips per day to and from the urban areas (Transport Branch, 1994). Therefore, in order to meet this growing demand for transport and to improve accessibility for residents in the North West New Territories (NWNT), a rail link with urban Kowloon was proposed. This rail link would also provide a transportation network around which development of NWNT will take place, including construction of more than 40,000 residential property development units. Nonetheless, the major project objective for KCRC would be achieving operational profit (Anonymous, 1999b; Yuen, 1999).

Key enabling mechanisms and decision to proceed

The construction of West Rail (Phase I) originates from the idea of constructing a rail link from the North West New Territories to Tsuen Wan in the second Comprehensive Transport Studies (CTS-2) in 1989, a comprehensive territory-wide transport plan for Hong Kong. After a series of debates in the Legislative Council (LEGCO) during the consultation period, the Railway Development Strategy (RDS) was published in 1994. The concept of a 'Western Corridor' was recommended in RDS, with West Rail (Phase I) referred in the document as the sub-regional passenger service.

After the submission of the proposal by KCRC for the Western Corridor project to the Government in 1995, it has gone through the eyes of LEGCO again regarding the high costs, the tendering process for the contracts for the preliminary technical studies and the nondisclosure of 'commercially sensitive' information in the proposal. After a series of intensive debates in LEGCO and media speculation, in December 1994 the Executive Council approved the sub-regional passenger service of the Western Corridor Railway, which is now referred as West Rail Phase I, or simply the West Rail. The freight line and the cross-border line were grouped together as West Rail Phase II, for later implementation.

The first reading in December 1996 and the third reading and passage of Railway Ordinance in June 1997 gave KCRC and the government the power of land resumption. In January 1998, a bill seeking to amend the existing KCRC Ordinance to empower KCRC to construct and operate new railway projects, including West Rail, was gazetted (KCRC, 1998a). On 25 March 1998, the KCRC (Amendment) Bill 1998 was enacted following the third reading at the Legislative Council sitting. The amended KCRC Ordinance empowers KCRC to construct and operate new railway projects including West Rail. The amendments also provide a proper share capital structure and a mechanism for dividend payments to the Government. This enables the Government to inject equity into KCRC towards funding the construction of new railways and eliminates difficulties that KCRC might face in obtaining commercial loans (KCRC, 1998b). On 23 March 1998, the final report of the Environmental Impact Assessment on West Rail was also endorsed by the Advisory Council on the Environment for the West Rail construction (KCRC, 1998b).

Main organisations involved

Kowloon-Canton Railway Corporation (KCRC)

Kowloon-Canton Railway Corporation (KCRC) was founded in 1982 through the enactment of the Kowloon-Canton Railway Corporation Ordinance. It was founded as a railway operating company. It was responsible for running the railway between Hung Hom and Lo Wu (the present East Rail line), which was run by the government-owned Kowloon-Canton Railway before 1982. The corporation is wholly owned by the Government, with a management board, which was appointed by the Chief Executive of the Hong Kong SAR Government, to monitor the operation of the Corporation.

Figure 4: The Organisation Structure of KCRC (2009)



Source: KCRC (2009)

Main government bodies

The following government bodies and departments are those which played more pro-active roles throughout the realization of the West Rail project.

Legislative Council (LEGCO)

Including the Finance Committee, the Transport Panel and its West Rail Subcommittee, LEGCO played an important role in supporting and approving KCRC's proposal, after the approval by the Executive Council. The LEGCO Transport Panel West Rail Subcommittee played an influential role, as a 'watchdog', in assessing the West Rail proposal by KCRC in great detail. Also, the West Rail Subcommittee meetings provided the arena for Government officials, KCRC representatives and LEGCO members for discussion and clarification of all related matters regarding the West Rail.

Other government departments

Other government departments and bodies involved were the Executive Council, Transport Department, Planning Department and Highway Department. The Transport Department is responsible for the Comprehensive Transport Studies while the Highway Department is responsible for the Railway Development Strategy. Local district councils, including Shum Shui Po, Kwai Tsing, Tsuen Wan, Yuen Long and Tuen Mun District Councils were supposed to reflect the local community's voice throughout the process of planning and implementing West Rail, even though district councils in Hong Kong have very limited power in the political scene.

Consultants and contractors

The following tables summarise the names of the main contractors involved in the West Rail Project.

Table 1: Consultancies for technical studies (later retendered in November 1996)

Pacific Bechtel Corporation (Project Management Adviser)						
Hong Kong Shanghai Banking Corporation Investment Bank Asia Ltd (Financial Adviser)						
Chesterton Petty (Land Adviser)						
Johnson Stokes and Master (Legal Adviser)						
Hill and Knowlton (Public Relations Adviser)						
A.T. Kearney (Freight and Transport Adviser)						
Johnson Higgins (Risk and Insurance Adviser)						

Source: Hon (1996e)

Table 2: Consultancies for technical studies (after retendering in November 1996)

Parsons Brinckerhoff (Asia) (Rail alignment and land requirement for the Kam Tin maintenance depot, tunnel ventilation and aerodynamics)

Acer Atkins Kaiser Joint Venture (Rail alignment and land requirements for north and south sections),

Halcrow (Rail alignment and land requirements for west section)

Atkins Haswell (Rail alignment and land requirements for central section)

ERM-Hong Kong (Environmental impact assessment)

ERM/International Risk Management Services/British Railway Research Joint Venture (Safety requirements for alignment, land and structures)

Source: Hon (1996g)

Table 3: Detailed design contractors

Atkins China Limited
Hyder Consulting Limited
Maunsell Consultants Asia Limited
Ove Arup & Partners Hong Kong Limited
Parsons Brinckerhoff (Asia) Limited
Source: KCRC (2003e)

Table 4: Civil construction contractors

AMEC – Hong Kong Construction Joint Venture
Balfour Beatty-Zen Pacific Joint Venture
China State-Zen Pacific Joint Venture
Chun Wo-Fujita-Henryvicy Joint Venture
Costain-China Harbour Joint Venture
Dragages-Zen Pacific Joint Venture
HKACEJV
Kier-Zen Pacific Joint Venture
Maeda-Chun Wo Joint Venture

Table 4: Civil construction contractors (continued)

NECSO Entrecanales Cubiertas, SA
Nishimatsu-Dragages Joint Venture
Penta-Ocean-Kier Joint Venture
Sino-European Joint Venture
Sun Fook Kong Joint Venture
Zen-Pacific-China State-Ngo Kee Joint Venture

Source: KCRC (2003e)

Table 5: Railway Systems Contractors

Alcatel Canada Inc. Transport Automation
Andrew Corporation
Booz Allen & Hamilton (Australia) Limited
Constructions Industrielles De La Mediterranée
Chun Wo-Henryvice-China Railway Construction Corporation Queensland Rail Joint Venture
IKK Consortium
Leighton-RSA Joint Venture
LORIC Consortium
Mitsubishi Electric (Hong Kong) Limited
Nissho Iwai-Nabco Consortium
Plasser & Theurer Export Von Bahnbaumaschinen Gesellschaft m.b.H
Ryoden Lift and Escalator Co Ltd
Shenzhen Sunray Group Co Ltd
Shinryo Corporation
Speno International SA
Thales e-Transactions CGA SA
Siemens CITIC Consortium
Siemens Limited

Source: KCRC (2003e)

Other stakeholders

Other stakeholders include: village communities in the New Territories who were affected by the construction of the West Rail project (e.g. near Kam Tin and Yuen Long); real estate companies responsible for associated developments along the West Rail railway lines and station developments, such as Sun Hung Kei Properties and Cheung Kong (Holdings); environmental groups, which played very little part; and the commuters residing in NWNT and commuting to urban Kowloon and Hong Kong to work every day.

For details regarding the involvement of the main organization in the West Rail project, please refer to the Project Timeline.

Planning and environmental regime

Outline of planning regime

The West Rail passes through Shum Shui Po, Kwai Tsing, Tsuen Wan, Yuen Long and Tuen Mun District. The reclaimed area around Nam Cheong station has been vacant for years, while the land on which Tsuen Wan West station sits is a piece of newly-reclaimed land. Both locations are planned with mixed-used residential-retail property developments after the completion of West Rail. With Hong Kong being a typical example of the 'rail + property development' developmental approach, associated residential, commercial, retail, office and hotel developments would be planned along the West Rail and its stations in other districts. KCRC had also conducted briefings with the Town Planning Board regarding the impacts of West Rail on the Outline Zoning Plan (OZP) (LEGCO, 1996e).

Environmental issues and ecological mitigation

KCRC commissioned ERM-Hong Kong to conduct an EIA prior to commencement of the construction of West Rail, as the final assessment report. The key areas of assessment included: construction and operational noise; air quality; water quality; landscape and visual issues; land use issues; archaeological and cultural resources; and ecology.

The objectives of this Environmental Impact Assessment were to:

- describe the elements of West Rail that were to be assessed;
- define the standard and criteria which have been applied to the project;
- explain the assessment methodologies employed by the EIA study team;
- identify potential impacts and potentially affected populations and environmental resources;
- provide a detailed assessment of environmental issues and impacts and make recommendations for their resolution and mitigation;
- describe residual impacts;
- ensure that mitigation measures are integrated with the engineering design process.

(ERM-Hong Kong, 1998)

The environmental issues and mitigation measures for West Rail are as follows:

Construction noise

In the Northern and particularly the Western Section, some exceedances at particularly sensitive receivers such as schools, homes for the aged and hospitals remained after the consideration of the proposals suggested by prior detailed assessment. In these cases, indirect mitigation measures were recommended to reduce potential impacts to within the established criteria. For example, construction works were carried out outside the examination period of the schools (ERM-Hong Kong, 1998).

Operational noise

The initial assessment of operational train noise identified unmitigated noise exceedance at all Noise Sensitive Receivers studied along the route for the design year period of 2006 to 2011. As part of the initial assessment, a package of mitigation measures was adopted, which included trackside absorptive barriers supplemented at specific locations by cantilevered noise barriers or full enclosure; an integrated design of structures, resilient track and noise barriers to achieve a maximum level of noise attenuation; specific limits on rolling

stock specifications; and a reduction in maximum operating speed. Mitigation measures to individual affected properties were also provided, when it was not possible to meet noise criteria with 'at source' mitigation alone (ERM-Hong Kong, 1998).

The performance of these measures reduces the overall height of noise barriers and therefore potential visual intrusion. The multi-plenum system is also a more sustainable choice of mitigation as it provides the flexibility of future enhancement as edge wall barrier heights can be incrementally extended to increase noise attenuation from 1.2m to full enclosure. This provides the government with greater flexibility in the long term land use planning of areas immediately adjacent to the West Rail, as these developments can be considered in much closer proximity to the railway than would otherwise be the case. Also floating slab track and resilient baseplates have been used in order to minimise vibration transmission in the viaduct structure and the structural design optimization of the viaduct (ERM-Hong Kong, 1998).

In terms of operational noise, the use of Floating Slab Track for the viaduct section will significantly dampen vibration transmission through the viaduct structure and hence reduce reradiated noise. For the tunnel sections of West Rail, Low Vibration Track is used to provide vibration isolation and protection of neighbouring areas from the impacts of ground and structure borne noise (KCRC, 2001c).

Water quality

Measures were taken in order to ensure that there was no unacceptable residual water quality impact as a result of the construction of West Rail. These measures included provision of adequate capacity and maintenance of hydraulic performance in the temporary relocation and diversion of culverts and drains, full reinstatement of these facilities, interception of sediments, and completion of planned sewerage improvement works in advance of the construction of West Rail (ERM-Hong Kong, 1998).

Also, further investigation and assessment of the engineering design and construction proposals was undertaken to ensure that disturbance to flow, ingress of pollutants, siltation and flooding were minimised as far as possible. The detailed assessment indicated that, for the rail design and construction methods proposed, the scale of dredging, excavation, runoff and drainage was implemented, water quality impacts were temporary and localised (ERM-Hong Kong, 1998).

Finally, the assessment concluded that the reclamation of Tsuen Wan Bay would not cause any adverse impact on flow or water quality off-site. The option of minimum dredging would also be used for the construction of the reclamation, as the dredged material was expected to be contaminated (ERM-Hong Kong, 1998).

Landscape and visual issues

The assessment indicated that significant temporary visual and landscape impacts would occur during the construction phase, primarily in the Southern and Central sections. Mitigation measures, such as advanced planting, screen planting and decorative hoarding, were recommended to minimise the temporary impacts during the construction phase (ERM-Hong Kong, 1998).

Archaeological and cultural resources

The potential direct impacts on the temple and Cheung Po were mitigated through the design of the Depot layout. Further mitigation to the setting of the temple was provided through appropriate planting and screening. Also, a buffer zone of 5m was adopted between

the heritage buildings of Lau's Residence at Tung Shing Lei and the site boundary for the construction worksite. A sympathetic external design of the station structure was adopted for the Tin Shui Wai Station, which is located some 40m from Tsui Shing Lau Pagoda. The local preference for a traditional Chinese architectural style was considered (ERM-Hong Kong, 1998).

Also, special attention was paid to the vibration impact on the Pagoda during the construction period and following the completion of the project, even though the predicted vibration levels would not cause any structural damage to the Pagoda (ERM-Hong Kong, 1998).

Ecological resources

In order to mitigate the loss of 12ha of wetland habitat, provision of 8.5ha of high quality created wetlands with the benefits of long-term management to defined conservation objectives was suggested. Strict control practices were also recommended to minimise potential disturbance during the construction phase to the Painted Snipe roosting site near Kam Tin Road. The construction of a 'Habitat Compensation Area' in Kam Tin and Pat Heung commenced in October 2001, in order to re-create a wetland for rare species of birds, frogs and other creatures. The Habitat Compensation Area covers the length of the railway easement corridor and adjacent land near the abandoned Kam Tim river meanders, as well as a land parcel located at the Northern Portal of the West Rail Tai Lam Tunnel. Totaling 12ha, the Area aims to provide breeding, nesting and foraging habitats for some rare or protected species of birds and creatures, such as egrets, herons, painted snipe and the narrow-mouthed frog (KCRC, 2001c).

On 23 March 1998, the final report of the Environmental Impact Assessment on West Rail was endorsed by the Advisory Council on the Environment. An independent checker was also appointed by KCRC, to conduct regular environmental performance audits of the work performed by work contractors, in order to ensure that all essential mitigation measures were in place prior to the commencement of works. The independent checker conducted regular site audits and inspections to check the site conditions, the status of the mitigation measures, and to review the environmental performance against the conditions set out in the Environmental Permit issued by the Environmental Protection Department. During construction, baseline monitoring and impact monitoring would be conducted on air, noise and water quality at specified locations, and the data would then be compiled into a report and be verified by the independent environmental checker (KCRC, 1998b,1999a).

Land acquisition

The Executive Council endorsed a Project Agreement between KCRC and the Government on the implementation of the West Rail project in 1998. The Agreement set out how the project would be undertaken, and the obligations of the Government and KCRC in terms of West Rail's financing, design, construction and operation (KCRC, 1998a). Land acquisition legislation for West Rail was introduced to the Legislative Council and was considered by a Bills Committee in 1997. The enactment of the Railways Bill is essential for the West Rail project as there was no suitable legal framework for implementing new railway projects at that time (KCRC, 1997b).

About 380ha of land was needed for the construction of the West Rail project, of which about a quarter was private land, and the remainder Government land. With the passage of the Railways Ordinance in June 1997, the Government was empowered to commence land acquisition procedures for West Rail, and all matters related to the resumption of land and rehousing and compensation were carried out by the Government. The Government's threestage land resumption exercise was gazetted on 16 October 1998, and the first stage involved 1,122 private lots, which reverted to the Government. The second and third stages of the land resumption programme were carried out in mid-1999 and late 1999 respectively. The Government resumed the land and handed it over to KCRC in phases from February onwards, with most of the land resumed being agricultural land. Land clearance for West Rail's rural section was successfully completed in mid-1999 by the Lands and Housing Departments with the support of other government departments and the West Rail team. A total of 217ha of land, involving about 1,200 private lots, was resumed in eleven operations which started from February 1999 and ended in mid-June. Over 3,000 structures and about 330 graves were cleared. Re-housing of affected families, involving about 1,500 persons from 589 families, was successfully arranged by the Housing Department. Site clearance work and fencing of the works area for the safety of members of public commenced (KCRC, 1997b, 1998c, 1999a, 1999c). HK\$8bn would be spent taking over land for the railway: around three quarters of this was government land and the rest public (Lucas, 1998).

C PRINCIPAL PROJECT CHARACTERISTICS

Route description

The alignment starts in the south, below grade at the Yen Chow Street over-run tunnel, south of the West Kowloon Prince Edward road interchange. It then rises to the Nam Cheong Street station and follows the West Kowloon Expressway to the north, through a short underground section at the West Kowloon Lai Wan Interchange before curving right across the Lai Chi Kok Park to Mei Foo Station (Anonymous, 2000).

From Mei Foo, the alignment heads northwards on a left hand curve, through the Ha Kwai Chung bored rock tunnel and Tsing Tsuen Road tunnel. It then extends northwards to the existing Wah Kai and Paul Y Industrial Buildings. The alignment then enters a cut-and-cover tunnel northwards to Tsuen Wan West station. From here, the route moves further north to the former site of Shun Kei Factory Estate, where it enters the Tai Lam (bored rock) Tunnel – passing below the Water Services Department Water Tunnel No 3. After continuing north the alignment passes through the Kam Tin Valley, with West Rail Depot maintenance on the west side. Trains then curve slightly to the west at a maximum speed of 130km per hour before the tracks separate to enter the double-island platform of Kam Sheung Road Station (Anonymous, 2000).

From Kam Sheung Road northwards, the route is mostly on viaduct. The two tracks cross Kam Tim Road and turn to the west, cross the Drainage Services Department drainage channel and then cross over both Route 3 and Castle Peak Road at a high level to Yuen Long station. To the west from Yuen Long station, the alignment is on a viaduct following a highly constrained corridor formed by Long Yip Street, Yuen Long On Lok Road and a principal drainage nullah straddled by Long Ping station. The alignment remains elevated, reaching Tin Shui Wai station which is planned to be a key West Rail/Light Rail/bus interchange facility. From the station, the route continues on viaduct, with trains reaching maximum speeds of 130kph en route to Siu Hong and eventually, to Tuen Mun Terminus (Anonymous, 2000).

Main termini and intermediate stations

Introduction

KCRC has been granted property development rights above or adjacent to West Rail stations and the West Rail Depot in Kam Tim. The net profits generated from the property development will be passed onto the Government (KCRC, 1998a, 2005). The Corporation and the Government have reached a consensus that the residential property sites along West Rail will be completed no earlier than 2008, in an effort to contribute towards market stability, and tenders were invited since April 2005 onwards. These projects, which are located in close proximity to the railway stations, help to secure a permanent and increasing ridership for the Corporation's railways by giving residents and their visitors convenient access to the railway network. (KCRC, 2005).

Nam Cheong Station

Nam Cheong Station is the first station of the West Rail. It is located on a piece of reclaimed land in West Kowloon, and is the main interchange station between the West Rail and the rest of the Mass Transit Railway (MTR) network. It is the first railway station to be shared by MTRC and KCRC and occupied by two different types of railway systems – the West Rail and the MTR Tung Chung line (Anonymous, 2000).

To the west of the station is the Cheung Sha Wan Wholesale Food Market and the land area to the east is designated for a future property development by KCRC, rising above part of the station. The Public Transport Interchange (PTI) is located to the north-east of the station and will be integrated into the future property development (Anonymous, 2000).

Mei Foo Station

Mei Foo Station is located in Lai Chi Kok Park in Kowloon. It is an interchange link station with the MTR Tsuen Wan Line, via an underground pedestrian tunnel.

Unlike other West Rail stations, which are all stand-alone structures, Mei Foo Station is integrated with the Lai Chi Lok Park, partly below ground and partly above ground. With a terrace concept, the roof is fully landscaped and integrated with the green surroundings (Anonymous, 2000).

Tsuen Wan West Station

Tsuen Wan West Station is situated in the western part of Tsuen Wan District on a reclaimed piece of land, facing Rambler Channel. It is the third station on the line from Nam Cheong Station, and is the first within the New Territories. It is the station around which most of the associated property development is expected to take place among all West Rail Stations (Anonymous, 2000).

In October 2006, KCRC received 13 expressions of interest for the joint venture property development at West Rail Tsuen Wan West Station TW7 site. Seven residential towers housing 1,776 flats will be built above a car park podium, together with a school of about 10,000m² (KCRC, 2007).

In April 2007, three tenders were received for West Rail Tsuen Wan West Station TW7 site property development. However, after reviewing the submitted tenders, KCRC announced that the Board of Directors of Tsuen Wan West TW7 Property Development Limited had decided not to award the tender and would re-tender the project (KCRC, 2008). Eventually, after re-tendering, Queensway Investments, a subsidiary of Cheung Kong (Holdings), won the tender for the Tsuen Wan West station TW7 property development project in September 2008 (ENN, 2008).

Kam Sheung Road Station

Located in a rural area scheduled for future development, Kam Sheung Road Station is proposed as a future interchange for the regional train to Shenzhen and the northern shuttle extension which will link to East Rail. The station and associated facilities have been designed to accommodate a large future property development above the station. Entirely above ground and two stories high, when the substantial surrounding residential development is constructed, the station will become hidden under a large landscaped deck (Anonymous, 2000).

Yuen Long Station

Like other West Rail stations, Yuen Long Station is to be integrated into a future property development. It is an above-ground structure, three stories high. Access to the station is via a footbridge connection from the adjacent property development – Sun Yuen Long Centre, as well as escalators and stairs, and a footbridge which also provides access to the existing LRT station through the Sun Yuen Long Centre.

The station structure forms the base for a future commercial property development above and a public transport interchange is to be provided at ground level as part of the future property development (Anonymous, 2000).

Long Ping Station

Long Ping Station is located in the northern part of the Yuen Long old town centre and is also entirely above ground. It is situated in a built-up urban area and spans major highways. The station is three stories high with access into the station generally via footbridges, escalators and stairs. The public transport interchange associated with the station will have a concrete roof that will later become a podium for future development (Anonymous, 2000).

Tin Shui Wai Station

Located in a built-up urban area and surrounded by major highways, Tin Shui Wai Station is visibly prominent from all levels. The three-storey high structure will also include a new station for the LRT at the northern end of the station. Station entrances, concourse, station trading, and passenger pedestrian access to the station is by footbridge and will be at first floor level. This level will also provide the passenger interchange between the West Rail and Light Rail station (Anonymous, 2000).

Siu Hong Station

Built over the Tuen Mun River channel, Siu Hong is the West Rail's major West Rail/Light Rail interchange point. The existing LRT Siu Hong Station has been re-provisioned and a new concourse built at first floor level to connect with West Rail. Three stories high, Siu Hong Station is entirely above ground. The ground level of the station contains the platform and the rail track viaduct – having dropped in elevation from Tuen Mun Station. Also included at ground level are the refurbished Siu Hong LRT Station platforms (Anonymous, 2000).

Station entrances are at first floor level, with station trading situated on the concourse. Passenger pedestrian access to the station is by footbridges from adjacent developments, and passenger vehicular access is by ramps from the main road at both ends of the station. This level is also where passengers interchange between the West Rail and Light Rail station concourses (Anonymous, 2000).

Tuen Mun Station

Tuen Mun Station is a three-storey above-ground structure. It is not only the terminal station but also an interchange station with the Light Rail San Fat Station. Passenger access to the station is by escalators and stairs from the public transportation interchange at street level. Road traffic is at ground level and is, therefore, grade-separated from pedestrian passenger traffic, which is at first floor level (Anonymous, 2000).

The existing LRT San Fat Station is to be demolished and the platform is to be re-built at first floor level. This level will also provide passenger interchange between the West Rail and Light Rail station, station entrances, concourse, station trading and staff accommodation (Anonymous, 2000).

In August 2005, KCRC received ten expressions of interest for the joint venture project at West Rail Tuen Mun Station. However only one developer submitted a tender, after the project's land premium, set by the Government, was criticised as being too high. After carefully reviewing the tender, the Corporation announced in December that it would re-

tender the project after re-negotiating the land premium with the Government in view of recent market changes (KCRC, 2006).

In August 2006, KCRC awarded the tender for the Tuen Mun Station development to Wetland Park Management Service Limited, a wholly-owned subsidiary of Sun Hung Kai Properties Limited. The development occupies an area of about 2.7ha, and will have an approximate gross floor area of 145,000m², comprising 120,000m² for residential use, providing 2,161 residential units, and 25,000m² for retail purposes. The Phase 1 foundation work for the project was nearing completion in November 2007 (KCRC, 2007, 2008).

Table 6: Summary of KCRC West Rail Property Developments

	Site Area (Hectares)	Residentia	al	Office		Retail	Hotel/Service Apartment		Government Institution & Community	Total Gross Floor
		Gross Floor Area (m ²)	No. of Units	Gross Floor Area (m ²)	No. of Towers	Gross Floor Area (m ²)	Gross Floor Area	No. of Rooms	Gross Floor Area/Net Operation Floor Area (m ²)	Area (m ²)
Tuen Mun	2.66	119,512	2,161	-	-	25,000	-	-	10,648	155,160
Kam Sheung Road	9.85	Under Pla	Under Planning							
Kwai Fong	1.92	Under Pla	nning							
Long Ping North	1.12	50,400	856	-	-	-	-	-	1,376	51,776
Long Ping South	1.49	60,972	900	-	-	-	-	-		67,792
Nam Cheong	4.62	300,300	4,247	41,640	1	26,930		-	730	369,600
Pat Heung Maintenance Centre	24	Under Pla	nning							
Tin Shui Wai	3.48	168,740	2,496	-	-	10,000	-	-		178,740
Tsuen Wan West TW5	5.61	226,600	3,250	-	-	65,070	20,470	450	16,300	328,440
Tsuen Wan West TW6	1.39	64,217	752	-	-	-	-	-	9,800	74,017
Tsuen Wan West TW7	2.37	113,064	1,776	-	-	-	-	-	1,400	144,464
Yuen Long	3.46	150,942	2,214	-	-	9,900	-	-	-	160,842

Source: MTRCL (2009)

Project costs

In April 1994, the estimated project costs for the Western Corridor (including both passenger and freight lines to the border from Kwai Chung) proposed by KCRC was HK\$23bn. In December 1994, after RDS was published, with the recommendation of constructing the Western Corridor Railway, and extending the rail line to West Kowloon, the estimated cost was HK\$23.1bn. The Secretary for Transport quoted the estimated cost of HK\$32bn if the West Corridor Railway were to extend to Tuen Mun Town Centre (Au, 2005).

In September 1995, with the government's agreement to extend the Western Corridor Railway to Tuen Mun Town Centre, the estimated cost quoted by the Government was HK\$30bn (Au, 2005).

In November 1995, KCRC submitted the proposal for West Rail (including Phase I and II), quoting the estimated cost of HK\$75bn. In June 1996, KCRC said the total cost for West Rail Phase I and II would be HK\$90bn, with the estimated cost for Phase I reaching HK\$80bn. This included the cost of land resumption (HK\$5.4bn), financing (HK\$8bn), project reserves (HK\$6bn) and the extension to Tuen Mun Town Centre (HK\$8bn) (Au, 2005).

In December 1996, the Executive Council approved Phase I of West Rail and withheld Phase II. Government consultants estimated that project costs will total around HK\$49.6bn in 'money of the day', of which Government support of approximately HK\$24.4bn would be required. KCRC's project cost estimates differ somewhat from the Government consultants' – a total cost of HK\$56.4bn was predicted by KCRC (KCRC. 1997a). However, KCRC estimated that within the projected cost of HK\$56.4bn, HK\$38.4bn would be provided via government support, HK\$10.4bn via debt, HK\$1.9bn via property development and HK\$5.7bn funded by the Corporation itself. This differs somewhat from the government consultants' estimate of HK\$24.4bn government injection, HK\$20.9bn via debt, HK\$1.9bn via property development and KCRC funding of HK\$2.4bn (KCRC, 1997a).

In 1998, the cost estimate set out in the Project Agreement was raised to HK\$64bn (KCRC, 1998a). However, the cost was revised by KCRC to HK\$51.7bn in July 1999 and subsequently decreased by 10% to HK\$46.4bn in December 2001. This included the anticipated aggregate capital costs, including land acquisition, construction and equipment purchases and interest during construction with respect to West Rail Phase I. Of the HK\$46.4bn project cost, \$39.8bn was for construction, \$6.0bn for land and the remaining \$0.6bn for financing costs (KCRC, 2002e).

(HK\$bn)	1998	1999	2001	Project cost at completion in 2003
Capital costs	51	43.4	39.8	n/a
Land costs	7.9	7.0	6.0	n/a
Financing costs	5.1	1.3	0.6	n/a
TOTAL	64.0	51.7	46.4	40.4

Table 7: Comparision between estimated total cost in 1998, 1999 and 2001 with the actual cost at completion in 2003

Source: KCRC (1998a, 2002e), project cost calculated from KCRC Annual Report 1995-2003

Table 7 shows that the total project cost was revised downwards several times; yet, the eventual project cost was still lower than the final revision of the cost estimate. The

downward revision can be attributed to a combination of factors, including effective cost control, continued value engineering, low inflation rates, lower prices resulting from a competitive market, and lower financing costs (Ng, 2001; KCRC, 2001a, 2002e).





Source: Calculated from KCRC Annual Report 1995-2003

Table 8: Comparison between estimated annual expenditure and the actual annual project cost 2001-2003 (estimated in 2001)

HK\$bn	2001	2002	2003
Estimated expenditure	10	8.8	8.0
Actual cost	9.7	6.5	4.8
Difference between estimated and actual cost	0.3	2.3	3.2

Source: KCRC (2002e), actual cost calculated from KCRC Annual Reports 1995-2003

Table 8 compares the difference between the estimated annual expenditure and the actual annual cost of the West Rail project in 2001-2003 (these being the only years for which these figures are available in the public domain). It shows that the difference between the two increased as construction reached its final stages.

Figure 6: Annual project cost for West Rail Phase I



Source: Calculated from KCRC Annual Report 1995-2003

1

Note 1: Year 1995-1998 was the pre-construction stage of the Project.

Note 2: Main Contracts include civil works and plant and equipment contracts; Associated Construction Costs include consultants' fees and feasibility studies costs; Overheads include staff costs, on-cost recovery and other costs.

Figure 5 shows the annual expenditure and cumulative total cost for West Rail Phase I each year, with Figure 6 showing the annual project cost. The concentration of construction work in the middle of the construction period is apparent from both figures, with the annual project expenditure highest in 2000 and 2001. This might be due to the concentration of civil engineering and construction work in both years, as reflected in the increase in project costs for Main Contracts in Figure 6.

Project programme

The following figures summarise the project programme and programme milestones of West Rail:

	1996	1997	1998	1999	2000	2001	2002	2003
Technical Studies								
Detailed Design (Civil)								
Civil Design-Build								
Civil Construction								
System-wide/ Desig n- Build								
Rolling Stock								
Testing and Commissioning								

Figure 7: West Rail Master Programme Summary

Source: Yuen (1999)

Table 9: Milestones for achieving primary programme objective

Key Milestone	Programmed Date				
Reversion of first phase of West Rail Site Areas	January 1999				
Rolling Stock Contract Awarded	February 1999				
Commencement of Tsuen Wan Reclamation Contract	March 1999				
All Station Civil Construction Contracts Awarded	October 1999				
All major Railway Systems Contracts Awarded	November 1999				
Install first 10km of railway length (i.e 35%) from Depot Area	March 2002				
Install central 25km of railway length (i.e. 85%)	May 2002				
Commencement of Test on Completion	February 2003				
Commencement of pre-Revenue Operations August 2003					
Commencement of Revenue Operations	December 2003				

Source: Yuen (1999)

Main engineering features

The following tables give an overview of the main engineering and construction features:

Major engineering feature					
Component	Length				
Viaduct	13.4km (44%)				
Open surface alignment	2.4km (8%)				
Bored tunnel	9km (30%)				
Cut-and-cover tunnel	2.5km (8%)				
Enclosed structure at grade	3.2km (10%)				
Total distance:	30.5km (100%)				
Major construction feature					
Rail tracks	91,000m				
Concrete	1.8 million m ³				
Reinforcing steel	300,000 tonnes				
Earth moved	9.6 million m ³				
Rock excavated	1.4 million m ³				

Table 10: West Rail engineering and construct	ction features overview
---	-------------------------

Source: Reuters News (1998b), Anonymous (1999)

Main contracts and contractors

A list of major contracts and contractors of the West Rail project are as follows:

Table 11: Major contracts and contractors (as of May 2003)

Civil Construction Contracts					
Package Title	Contract Number	Award Date	Awarded Contract Sum (HK\$m)	Consultant/Contractor	
Kwai Tsing Tunnels	DB-320	Oct 1998	1,903	Dragages-Zen Pacific Joint Venture	
Tai Lam Tunnel	DB-350	Sep 1998	1,790	Nishimatsu-Dragages Joint Venture	
Viaduct – Kam Sheung Road to Tin Shui Wai	CC-201	Jun 1999	1,213	Maeda-Chun Wo Joint Venture	
Yuen Long and Long Ping Stations	CC-202	Sep 1999	1,762	AMEC-Hong Kong Construction Joint Venture	
Tin Shui Wai Station	CC-203	Jul 1999	1,126	Chun Wo-Fujita-Henryvicy Joint Venture	
Viaduct – Tin Shui Wai to Siu Hong	CC-211	Jun 1999	904	Maeda-Chun Wo Joint Venture	
Siu Hong Station	CC-212	Jul 1999	1,386	HK ACE JV	
Tuen Mun Station	CC-213	Jul 1999	1,353	HK ACE JV	
Tsuen Wan West Station & Approach Tunnels	CC-300	Sep 1999	1,779	Penta-Ocean – Kier Joint Venture	
Tsuen Wan Reclamation	CC-302	Mar 1999	257	Sino-Europe Joint Venture	
Nam Cheong Station	CC-402	Sep 1999	2,238	Balfour Beatty-Zen Pacific Joint Venture	
Tunnel Works – Mei Foo to Nam Cheong	CC-403	Jun 1999	651	China State-Zen Pacific Joint Venture	
Mei Foo Station	CC-404	Jul 1999	1,243	Kier-Zen Pacific Joint Venture	
Civil and Infrastructure Works	CC-601	Jun 1999	948	Zen Pacific-China State-Ngo Kee Joint Venture	
Kam Sheung Road Station	CC-602	Sep 1999	495	NESCO Entrecanales Cubiertas, S. A.	
West Rail Headquarters	CC-603	Feb 2000	251	Sun Fook Kong Joint Venture	
West Rail Depot	CC-604	Dec 1999	693	Costain-China Harbour Joint Venture	
Railway Systems Contracts					
Package Title	Contract Number	Award Date	Awarded Contract Sum (HK\$m)	Consultant/Contractor	
Train Control and Signalling System	DB-1300	Mar 1999	383	Alcatel Canada Inc. Transport Automation	
Traction Power and Overhead Line	DB-1400	Sep 1999	137	Siemens CITIC Consortium	
Telecommunications Systems	DB-1500	Nov 1999	287	Siemens Limited	

Main Control System	DB-1510	Jul 1999	164	Siemens Limited
Commercial Communications	DB-1520	Jul 2001	47	Andrew Corporation
Integrated Training System	DB-1530	Dec 1999	31	Booz Allen & Hamilton (Australia) Ltd.
Automatic Revenue Collection	DB-1650	Oct 1999	329	Thales e-Transactions CGA S.A.
Platform Screen Doors	DB-1700	Oct 1999	181	Nissho Iwai-Nabco Consortium
Escalators	SI-1120	Oct 1999	255	Constructions Industrielles De La Mediterranee
Lifts	SI-1121	Oct 1999	80	Ryoden Lift and Escalator Co. Ltd.
Tunnel Ventilation System	SI-1200	Jan 2000	105	Shinryo Corporation
Electric Multiple Units	SP-1900	Mar 1999	3,102	IKK Consortium
Cab Simulators	SP-1901	Feb 2000	24	Mitsubishi Electric (Hong Kong) Limited
Diesel Locomotives	SP-2100	Jun 2000	33	Shenzhen Sunray Group Co Ltd
Works Wagons & Rail Buses	SP-2101	Jun 2000	19	LORIC Consortium
Supply of Rail Grinding Vehicle	SP-2103	Jan 2002	36	Speno International SA
Track Tamping Vehicle	SP-2104	Jul 2002	18.3	Plasser & Theurer Export Von Bahnbaumaschinen Gesellschaft m.b.H
Permanent Way – Southern Area	CC-1810	Sep 1999	756	Leighton-RSA Joint Venture
Permanent Way – Northern Area	CC-1820	Sep 1999	431	Chun Wo-Henryvicy-China Railway Const. Corp- Queensland Rail JV
Detailed Design Contracts (Civil)				
Package Title	Contract Number	Award Date	Awarded Contract Sum (HK\$m)	Consultant/Contractor
Yuen Long Section	DD-200	Mar 1998	263	Ove Arup & Partners Hong Kong Limited
Tuen Mun Section	DD-210	Mar 1998	172	Maunsell Consultants Asia Limited
LR Extention and Grade Separation	DD-220	Jun 1999	166	Atkins China Ltd.
Tsuen Wan Section	DD-300	Mar 1998	219	Atkins China Ltd.
Sham Shui Po Section	DD-400	Mar 1998	232	Hyder Consulting Limited
West Rail Depot and Station	DD-600	Mar 1998	128	Parsons Brinckerhoff (Asia) Ltd.
Tunnel Ventilation	DD-1200	May 1998	45	Parsons Brinckerhoff (Asia) Ltd.

Source: KCRC (2003e)

Major civil engineering components

Tai Lam Tunnel (DB-350)

- Total length: 5.5km;
- Drill and blast techniques were used in the construction, by advancing from the north and south respectively;
- Tunnel design incorporates a 110m³ cross section and a central dividing wall separating the twin rail tracks;
- Trains can switch over from the up line to the down line in either direction on the crossover point located at the half way mark of the tunnel;
- The portal at the southern end is approximately 24m below ground level and required a diaphragm wall to allow access for the construction of a 350m long section of cut and cover tunnel;
- Throughout construction of the wall, Atlas Copco XAS350 air compressors provided an actual free air delivery of 21m³/min;
- A loading ramp jutting out into the sea, also at the southern end, was used to load rock excavated from the tunnel onto barges for eventual discharge at designated sites;
- A rental Atlas Copco XAS76 portable air compressor provided air power for the ramp construction.

Source: CWN (1999)

Kwai Tsing Tunnels (DB-320)

- Total length 3.6km, including Ha Kwai Ching Tunnel (1.7km), Tsing Tsuen Tunnel (1.78km) and Tsing Tsuen cut-and-cover section (0.12km);
- The contract also included a ventilation and sub-station building, two emergency access shafts, three construction access shafts and provisions for electrical, mechanical and specialist rail installations;
- Using a mixed ground Earth Pressure Balanced Tunnel Boring Machine (EPBM) the first time in Hong Kong;
- A mix ground tunnel boring machine (TBM);
- Diameter of the shield at the head of the EPBM: 8.7m;
- Total length of the EPBM: 105m;
- Pre-cast concrete tunnel lining segments supported the excavated area behind the TBM.

Ha Kwai Chung Tunnel

- Ha Kwai Chung Tunnel was excavated by drill and blast using four Jumbo tunneling machines, two progressing each end of the section;
- The concrete lining: 0.3m thick and protected from the rock by a waterproof membrane;
- A large 50 degree skew at the south portal;
- Tunnel mouth: 27m wide;
- Reinforced concrete slab thickness for laying track forms: 0.25m;
- Two rail tracks separated by an 8m vertical wall.

Source: Anonymous (2000)

Mei Foo to Nam Cheong Tunnels (CC-403)

- 1.3km earth-mounded box structure;
- 700m cut-and-cover tunnels;
- Ranging in depth from +2m to -5m below ground;
- Extensive de-watering equipment used as the work was carried out below the water table;
- 200,000m³ of excavated materials (80,000m³ required disposal, the remaining 120,000m³ were used for backfilling).

Source: Anonymous (1999)

The viaducts (CC-201 and CC-211)

- The viaducts were assembled using the glued segmental system;
- Viaduct segments were precast in Dongguan, China;
- The production line for the viaduct segments: 700m long, 600 workers;
- Number of segments used: 8,728 segments;
- Reinforced concrete used: more than 200,000 tonnes;
- Segments made using the 'match-casting' technique.

Source: Anonymous (2000)

D PROJECT TIMELINE

Project	Timeline		
Year	Month	Type of Decision	Key Decision/Event
1989	May	Project Initiation	• A proposal for an urban rail link linking up the North West New Territories and Western Kowloon was first mentioned in the <i>Hong Kong Second Comprehensive Transport Study: (CTS-2) Final Report 1989</i> (Transport Department, 1989:132).
		Line Haul & Hubs	 Two possible termini for the rail lines, connecting either Tuen Mun or Yuen Long and Tin Shui Wai, with Tsuen Wan. Concluded that Yuen Long appeared to be the most suitable location for the West Rail terminal, and the Project was feasible given the population estimate accompanied by the growing demand for traffic. (Transport Department, 1989:135).

Figure 8: Map of the North West New Territories Rail Links



Source: Transport Department (1989)

Project	t Timeline		
1993	July	Project Initiation	 Public consultation for Railway Development Strategy was carried out from April to July 1993 (Au, 2005). Members of LEGCO generally supported the concept of Western Corridor, which includes (a) a passenger line from North West New Territories to West Kowloon (later named the West Rail); (b) a freight line connecting Kwai Chung Container Terminal to mainland China (Port Rail Line); and (c) a cross-border passenger service (Transport Branch, 1994; LEGCO, 1993).
		Line Haul & Hubs	 It was revealed by Mr. Frederick Fung in the LEGCO meeting on 7 July 1993 that KCRC made a relevant feasibility study in 1992 for the rail link concept, commenting that the passenger service would only play a secondary role to the proposed Port Rail Line linking Shenzhen in China via Yuen Long with Tsuen Wan and Container Terminal 8 in Kwai Chung. Some LEGCO members highlighted the importance of a passenger rail service linking up North West New Territories with West Kowloon, with suggestions of extending it to Tuen Mun (LEGCO, 1993).
1994	March	Project Initiation	 In the LEGCO meeting on 9 March 1994, the amendment proposed by Michael Ho, based on the original motion proposed by Alfred Tso, was passed:
			"As the early construction of the Northwest New Territories Railway and its extension to Tuen Mun Town Centre will substantially ease traffic congestion throughout the New Territories West and the New Territories South and will be conducive to China-Hong Kong economic development, this Council urges the Government to take immediate action to work out a timetable for the construction of the project and to set aside the necessary funds or make other appropriate financial arrangements for its construction in order to ensure that the project will be completed in the year 2001 or before." (LEGCO, 1994a).
	December	Project Initiation	 Railway Development Strategy was finally released, referring to the West Rail as 'a sub-regional passenger service' of the Western Corridor (Transport Branch, 1994:13). Secretary of Transport Mr. Haider Barma said the Government would invite KCRC to submit a proposal to build the Western Corridor Railway (LEGCO, 1994b).
		Line Haul & Hubs	 Recommended as a high speed rail link connecting the urban area with the North West New Territories, via Kam Tin, Yuen Long and Tin Shui Wai before terminating at Tuen Mun North, where 'considerations could be given to extending the link to Tuen Mun Town Centre' (Transport Branch, 1994:13). Existing Light Rail would provide a feeder service to the passenger service of West Corridor Railway in the North West New Territories, whichwould be designed to interchange with the existing MTR and the Airport Railway in Kowloon (Transport Branch, 1994).
1995		Project Initiation	• The Hong Kong Government invited Kowloon-Canton Railway Corporation and the Mass Transit Railway Corporation to submit a proposal for the design, construction and operation of West Rail (Blessis, 2000).
	November	Project Initiation	Full proposal for West Rail project was submitted by KCRC (Moss, 2003).
1996	Мау	Project initiation	• A representative from the Chinese Government (Chen Zuoer) emphasised that the construction of West Rail could only start when all aspect of the railway, including the finance and design, were agreed on by

oject Timeline						
		 China, with the future HKSAR government's consent (Au, 2005). 25 design consultants were shortlisted by KCRC to bid for the seven preliminary engineering contracts (Wallis, 1996). 				
June	Implementation	 LEGCO Transport Panel was dissatisfied with the slow pace and lack of transparency of the project, and passed a motion that 'the KCRC should, with immediate effect, withhold contracts for the technical studies estimated to cost HK\$75m', and also set up a subcommittee to monitor the project. The first meeting of the Subcommittee on West Corridor Railway Project, LEGCO Panel on Transport was held on 21 June 1996. The Acting Secretary for Transport, Mr. Paul Leung, said the target date for the completion of the project might be too optimistic as a significant number of issues were involved including engineering alignment, legislative programme, financial arrangements and the most time consuming of all – land resumption. At the same time, only 5% of the design of the project was completed so far by the consultant's studies (LEGCO, 1996a). A Project Steering Committee chaired by the Acting Secretary of Transport was set up for the co-ordination of relevant policy branches and departments (LEGCO, 1996a). Over 90 options for West Rail were considered in the Railway Development Study (RDS), while the proposal submitted by KCRC considered another ten options in order to shorten the route and to reduce costs. The study concluded that the proposal in RDS was the best option available (LEGCO, 1996a). The second meeting of the Subcommittee on West Corridor Railway Project was held on 28 June 1996 (LEGCO, 1996b). 				
July	Project Initiation	 The third meeting of the LEGCO Transport Panel's West Rail Subcommittee discussed the detailed engineering report and the transport planning of West Rail. It was revealed that the patronage forecast was based on the assumption that there would be no direct bus services from North West New Territories to urban Kowloon, with West Rail taking up 45% of the commuters (LEGCO, 1996c). The forth meeting for the LEGCO Transport Panel's West Rail Subcommittee was held on 12 July 1996, discussing the financial analysis of the West Rail project. Some members questioned whether KCRC, a small corporation with an asset of HK\$8.5, was able to carry out the West Rail project (LEGCO, 1996d). Legal empowerment and land requirement issues were discussed in the fifth West Rail Subcommittee meeting on 19 July (LEGCO, 1996e). The implementation plan including land resumption and the technical studies programme were discussed in the West Rail Subcommittee meeting on 26 July. Government officials said legislation would be drafted and a special team would be set up in Lands Department for land resumption purposes. Also, they made it clear that the decision on West Rail would be made by the SAR Government since the project was expected to commence in 1998 (LEGCO, 1996f). On the same day, LEGCO Finance Committee approved the spending of HK\$230m on consultancy contracts for nine technical studies by the government to assess KCRC's proposal (Au, 2005). The director of the West Rail project admitted the timetable had already slipped by six months (Hon, 1996a). 				

August	Implementation and Financing	•	In the West Rail Subcommittee meeting on 2 August, it was revealed that KCRC did not arrange for tenders for the engineering technology consultancy contracts, which led to a request to the Administ and KCRC by the Subcommittee for a report regarding the incident (LEGCO, 1996g).
	Corporate Governance	•	KCRC Chairman and CEO, Kevin Hyde, announced he would be leaving KCRC after his contract ex Legislators called for localization of the post (Au, 2005).
September	Implementation	•	A special West Rail Subcommittee meeting was called on 6 September after press reports on KC revelation that consultancy firms over and above the 14 previously made know to the Subcommittee last meeting had been awarded with contracts without going through the open tender process. Hyde, the Chairman and CEO of KCRC at that time, admitted that there were 22 contracts awarded we tender. The Secretary of Transport reiterated that the Administration would provide a report on this subcommittee meeting, and would not rule out the possibility of requesting the Chairman the Board of KCRC to amend tendering principles and procedures (LEGCO, 1996h). On 24 September, the report regarding KCRC's award of consultancy contracts without tender circulated in the West Rail Subcommittee special meeting. 51 contracts were awarded through tender. The report concluded that KCRC's tendering policies were generally in line with tho Government and other organisations covered in the study, while the Administration disagreed with management decision in 1989 to exclude consultancy from the corporate tendering policies and proce
		•	were not deemed necessary, but certain adjustments aimed at introducing more checks and balances recommended (LEGCO, 1996i). A study commissioned by Airport Consultative Committee member Francis Cheung King-fung sugg that KCRC had overestimated the cost of West Corridor Railway by nearly \$44bn. Savings could be by redesigning routes, mainly by connecting with the MTR and the Airport Railway. Also, he suggeste KCRC had overestimated future demand for freight (Chan, 1996). It was revealed that 70% of the senior posts in the West Rail division of KCRC were filled by ou consultants, which created fears among some LEGCO members that KCRC did not have the expert
October	Project Initiation	•	run the project, and about the lack of supervision of expatriate consultants (Hon, 1996b). Ian McPherson, the Director of West Rail, stressed that while there was a delay in land acquisition ne
		•	for tracks and stations, which in turn would delay the completion date of the West Rail project, this would affect KCRC's ability to borrow overseas and fund the project (DJIN, 1996a). Chinese officials commented that the West Rail project was expensive, and complained that they habeen fully informed about KCRC's planning of the project (DJIN, 1996b). Nevertheless, they gave blessing to the project after a Joint Liaison Meeting, stressing that at the same time, the project had 'speedy, good and cheap' (Wong, 1996a).

Project	t Timeline		
	October	Project Initiation	 The media reported that due to scaling down of the technical study of the Western Corridor Railway project, KCRC was planning to slash staff working on the project in order to 'appease the legislator' with a saving of \$20m a month. The majority of the staff were from consultancy firms employed by International Bechtel, the project manager of KCRC for the Western Corridor Railway (Hon, 1996c). It was reported in late October that KCRC was planning a progressive increase in the number of permanent staff in its West Rail division in order to avoid over dependency on outside consultants (Hon, 1996f). On 22 October, KCRC confirmed the board decision to sack an unspecified number of consultants working on the Western Corridor Railway. Gordon Siu, the Secretary of Transport denied the staff cuts had been suggested by the Government, and explained that it was a consequence of scaling down the technical studies, which covered the rail alignment only (Hon, 1996d). Two days later, in the West Rail Subcommittee Meeting, KCRC announced the re-tendering of all core consultancies (LEGCO, 1996j). Ian McPherson, the Director of West Rail division of KCRC, denied that this was due to pressure from LEGCO. "Those contracts were all awarded through tender. It was also our original plan to re-tender the core consultants for the detailed design studies because the work is different from that of the technical studies" (Hon, 1996e). Also, it was stressed in the Subcommittee meeting that the Administration would make a final decision on the West Corridor Railway in December 1996 (LEGCO, 1996j).
	November	Project Initiation	 Eight contracts for the technical studies of West Corridor Railway were named (Hon, 1996g). Chinese officials criticised the freight forecast prepared by AT Kearney for the Western Corridor Railway as unrealistic and urged KCRC to concentrate on handling the expected 219m domestic passengers instead (Wong, 1996b). On 18 November 1996, KCRC announced it would cut 50% of the staff working on Western Corridor Railway, saving HK\$20m to \$30m a month (Hon, 1996h).
	December	Project Initiation	• In December 1996, KCRC's proposal for the West Rail was chosen by the Government for implementation of the Western Corridor (Phase I). Phase I of the project includes a domestic passenger line, connecting the urban area to the North West New Territories from Nam Cheong, via Tsuen Wan West, Kam Tin, Yuen Long, Long Ping and Tin Shui Wai (KCRC 1997a). Also, the government announced the freeze on the construction of the cross-border freight line of the Western Corridor Railway (Cheng, 1997).
		Corporate Governance	• On 11 December 1996, K K Yeung was appointed by the Government as the new KCRC chairman and chief executive officer (Delfino, 1996).
		Implementation	 First reading of the Railways Bill to give power to KCRC and the government in land resumption matters (Au, 2005). On 19 December 1996, KCRC announced that they would need to hire an additional 160 advisors from consultants, including those who were laid off in November, in order to meet the tight deadlines (SCMP, 1996).

Project	oject Timeline						
1997	January	Project Initiation	 The first participation in the West Rail Subcommittee meeting by the new KCRC Chairman, K Y Yeung. KCRC was given a mandate by the Government in December 1996 to complete the design and draw up a project agreement for the domestic passenger line of West Corridor Railway within 14 months. Construction was expected to commence in mid-1998 and the Yuen Long and Tuen Mun sections would be completed by the end of 2002 and September 2003 respectively. Compared to the original KCRC proposal, the land requirement of Phase I was reduced by about 40%, and the estimated construction cost at that time was about HK\$56.4bn in money of the day. He also provided reassurance that the upcoming consultancy contracts would go through an open tendering process (LEGCO, 1997a). On 16 January 1997, after being briefed by senior government officials and KCRC's representatives, the infrastructure subgroup under the HKSAR Preparatory Committee's economic subgroup endorsed the construction of the amended Western Corridor Railway, which includes only the intra-regional passenger service and excluded both the cross-border route and the freight route of the project (No, 1997). It was in the press in early January that KCRC was planning to increase the number of its staff to at least 100 on the Western Corridor Railway Project in order to gain more control over the project. It was proposed that some of the staff could be hired by internal transfer – from contract-based consultant staff employed in the KCRC West Rail division would become permanent staff on local terms. At that time, the West Rail division would become permanent staff on 158, with Bechtel staff numbers falling to 111. The ratio of KCRC staff to Pacific Bechtel staff numbers falling to 111. The ratio of KCRC staff to Phase 2 of the technical studies (Hon, 1997a). 				
	April	Project Initiation	• The Deputy Secretary for Transport said in the West Rail Subcommittee meeting that it would take 17 years starting from the commencement of construction to recover the total estimated project cost of HK\$49.6bn. The Internal Rate of Return (IRR) was 13.2%, with the estimated fare HK\$21 per ride (LEGCO, 1997b).				
	Мау	Project Initiation	 The final West Rail Subcommittee Meeting before the handover of sovereignty of Hong Kong back to China. In the meeting, KCRC said a multi-contract approach would be adopted and the works would be divided into different packages for design and construction, which cope best with the impact of land acquisition. Detail Design and separate Construction Contracts were planned for five principal civil work packages, and progress would be maintained notwithstanding anticipated difficulties in land resumption. Also, combined Design Build Contracts involving Tai Lam Tunnel and the tunnel between Mei Foo and Tsuen Wan would not only enable KCRC to retain direct control over the design process, but would also be used to facilitate the design of project-wide systems requiring highly developed and proprietary technology and significant design input from contractors (LEGCO, 1997c). The Chairman of KCRC, K Y Yeung, reassured the Subcommittee with the transfer of some employees from Bechtel, the chief technical advisor of KCRC for West Corridor Railway, to KCRC as in-house staff for 				

oject Timeline					
		reducing costs and technology transfer reasons (LEGCO, 1997c).			
June	Project Initiation	 Ian McPherson, KCRC's West Rail project director, said pre-qualification for the detailed design packages and construction contracts would start in July onwards. It was reported that KCRC was reassured by the Government that the West Rail scheme would be approved by the end of July 1997, after the return of sovereignty of Hong Kong to China (SCMP, 1997). The Railways Ordinance was enacted, a legislative framework for implementation of all new railway projects including West Rail (KCRC, 1997b). 			
July	Project Initiation	 Gazettal of the Tai Lam Tunnel Section of West Rail (KCRC, 1997b). The chairman of KCRC said the West Rail project would provide some 35,000,000m² of residential accommodation (Reuters News, 1997). ICF Kaiser announced that they received two contracts, totaling HK\$5m, to continue work on the West Rail project. The contracts included preliminary design work for the TS-100 section of the project as part of a joint venture called Hyder Atkins Kaiser, and another seven-month contract for the TS-2000 section which evaluates the technical and operational interface between West Rail and the existing Light Railway Transit (LRT) in Tuen Mun, as part of a joint venture called Kaiser Hyder (DJNS, 1997). 			
August	Implementation	 James Blake, KCRC's senior director for corporate projects, said they would push ahead with the tendering of contracts for the design and construction of West Rail, despite not having secured the Government's final approval. He said it was unlikely contracts would be awarded before September 1998, while the call for expressions of interest did not indicate the government had committed to the project. It was reported that an agreement between the government and the KCRC would be expected to go to the Executive Council in February 1998 (Kelly, 1997a). KCRC placed advertisements in newspapers to seek firms interested in qualifying as tenderers for the five Detailed Design contracts for West Rail, which was the initial step for the selected companies to be invited to tender for Detailed Design contracts (KCRC, 1997b). KCRC said at least half of a substantial part of phases one and two of Lai Chi Kok Park would be demolished in order to put the West Rail underground to relieve concerns about noise, but provided assurance that the Architectural Services Department would redesign the park in order to accommodate associated facilities and the station within the park (Delfino, 1997a). It was announced that lan McPherson, West Rail director, would step down in May 1998, while denying that localisation of the post was a factor (Delfino, 1998b). Ian McPherson said KCRC was on track for an agreement with the government on funding for the West Rail 			
		project, and said the project cost was estimated at HK\$56bn at the time, although that did not include land resumption costs (Kelly, 1997b).			
September	Financing	• To date, KCRC had spent HK\$680m on 21 technical studies and had called for expressions of interest in further five contracts expected to cost up to HK\$1bn more (Kelly, 1997b).			

Projec	roject Timeline			
			 On 18 September 1997, KCRC was given the same credit rating as the Hong Kong Government by Standard & Poor, which would make it easier to borrow up to HK\$30bn over the next six years to finance the construction of West Rail. Finance director, Samuel Lai, said KCRC had recently revised its estimate of the project's cost to HK\$60bn, from the previous HK\$56bn. This reflected the inclusion of the land premium to the Government from the acquisition of nearby land to facilitate construction. KCRC planned to pay up to half the construction cost by debt financing, with the first fund-raising exercise tentatively scheduled for the second half of 1998. Possible income from property developed along the railway would also be used to pay for the construction (Chan, 1997). Nevertheless, the government remained undecided as to how much public money it would inject into the West Rail project (So, 1997). 	
	October	Implementation	Gazettal of the remaining parts of the West Rail scheme (KCRC, 1997b).	
	December	Implementation	 The first roving exhibition of the West Rail project in North West New Territories – Pui To Light Rail stop (KCRC, 1997b). 	
1998	January	Project Initiation	 The Executive Council endorsed a draft Project Agreement between KCRC and the Government on the implementation of the West Rail project. The Agreement set out how the project would be undertaken, and the obligations of the Government and KCRC in terms of West Rail's financing, design, construction and operation (KCRC, 1998a). Roving exhibition held in Siu Hong Light Rail stop in Tuen Mun, Tin Yiu Estate Shopping Arcade, Long Ping Estate Shopping Centre and Yuen Long Plaza in Yuen Long (KCRC, 1997b). The draft Final Assessment Report for the Environmental Impact Assessment for West Rail was completed (KCRC, 1998a). 	
	February	Financing	 The Legislative Council Finance Committee approved \$29bn Government equity injection for the West Rail project, which marked the beginning of the West Rail construction (Moss, 2003). The total construction cost was HK\$51.7bn, equivalent to US\$6.6bn (Briginshaw, 2000) KCRC made a net profit in 1997 of HK\$420m, which would be committed to the capital costs of West Rail Phase I and other improvement programs (CNN, 1998). 	
	March	Implementation	 The five Detailed Design (civil) contracts were awarded by KCRC (KCRC, 1999b). The five design contracts were worth between HK\$128m and HK\$262.8m each, amounting to HK\$1bn in total. The contracts were granted to Ove Arup & Partners Hong Kong Ltd., Maunsell Consultants Asia Ltd., Atkins China Ltd., Hyder Consulting Ltd. and Parsons Brinckerhoff (Asia) Ltd (DJIN, 1998a). The detailed design works stimulated by the contracts would bring the design of the project from the current level of about 25% of full design to a level sufficient to prepare for the commencement of construction, which would be subject to the authorization of the railway scheme by the Executive Council (XNA, 1998a). The total cost for the project would be around HK\$64bn (XNA, 1998b). 	
	April	Corporate	• It was announced that Ian Thoms, the project manager for the Eastern Harbour Crossing and Airport Rail	

roject Timeline		
	Governance	would replace retiring Ian McPherson as director of West Rail (Ng, 1998).
	Project Initiation	• On 3 April 1998, the Government gazetted the amendments and corrections to the Urban and Western Sections of KCRC West Rail (Phase I). Under the Railway Ordinance, members of the public could raise objections to the amendments within 60 days since the gazettal (Asia Pulse, 1998).
	Implementation	Construction contractors had entered the bid for the two tunnelling contracts (Wallis, 1998).
June	Implementation	 Ian Thoms, the director of West Rail, pledged that West Rail would provide up to 14,000 job opportunities, exclusively for locals, and that contractors would not be allowed to bring in foreign labourers without strong justification (Wong, 1998). The West Rail plan would be submitted to the Executive Council for approval by the end of 1998, with the job vacancies available in mid-1999 (Wong, 1998). KCRC awarded eight contracts (seven consultancy contracts and one purchase contract) with a total value of HK\$70m, including the largest contract for the project's tunnel ventilation, which went to Parsons Brinckerhoff (DJIN, 1998b).
July	Implementation	 KCRC awarded three foundation load testing contracts to Express Builders Co., Gammon Construction Ltd., and Bachy Soletanche Group, valued at a total of HK\$103m. The contracts were related to the deep foundation load testing at seven West Rail stations in Western New Territories (DJIN, 1998c). Ian Thoms promised that the Corporation would maximise local participation in the tendering of contracts and personnel recruitment for the West Rail project to help stimulate the domestic economy (DJIN, 1998d).
September	Implementation	 The HKSAR Government announced the authorization from the Executive Council for the construction of West Rail. Around 13,000 jobs would be created. It would initially serve about 340,000 passengers a day, with ten sites available for property development. It would be equivalent to 3.5million m² of gross floor area – around 40,000 medium-sized housing units as well as office, retail and hotel space (DJIN, 1998e). It was reported in the press that the credit crunch in Asia and the higher risk premium attached to the region meant borrowing costs were higher for KCRC to finance the project via external borrowing. Also, the big slump in property prices in Hong Kong would mean that KCRC's equity injection into West Rail, which was derived from property development, would inevitably be affected. The chairman and chief executive of KCRC said financial appraisals were made in early 1997 and thus were not dependent on prices at the peak of the market (Lucas, 1998). The transport secretary said HK\$8bn would be spent taking over land for the railway: around three quarters of it being government land, and the rest public, for which compensation would be made (Lucas, 1998). On 23 September 1998, KCRC awarded the first major construction (Design-Build (civil)) contract for West Rail – a HK\$1.79bn contract for the design and construction of the 5.5km Tai Lam Tunnel (KCRC, 1998c; Reuters News 1998a).
October	Implementation	 Roving exhibition held in Yuen Long Plaza, Yuen Long (KCRC, 1998b) On 12 October 1998, KCRC announced that the construction of West Rail would begin on 26 October

Project	roject Timeline			
			 (Reuters News, 1998b). On 16 October 1998, the first stage of land resumption for the construction of West Rail started, with details of 1,122 private lots to be resumed in the first stage being gazetted. These private lots were planned to be reverted to the government on 16 January 1999 (XNA, 1998c). On 21 October 1998, KCRC awarded the second Design-Build (civil) contract, for the construction of the Kwai Tsing Tunnels to joint venture company Dragages-Zen Pacific (KCRC, 1998c; Reuters News, 1998c). The contract covered the detailed design, construction and commissioning of the 3.6km Kwai Tsing Tunnels and related works in Western Kowloon between the West Rail Mei Foo station and the West Rail Tsuen Wan West station (Reuters News, 1998c, 1998d). Commencement of construction of West Rail at the southern portal of Tai Lam Tunnel in Tsuen Wan on 26 October by Nishimatsu-Dragages Joint Venture (KCRC, 1999a; Reuters News 1998d). 	
	November	Project Initiation	 Two mixed-use residential and commercial developments on top of West Rail Tin Shui Wai station and Long Ping station were approved by the Town Planning Board. With a floor area of about 2million sq.ft, the Tin Shui Wai development would provide about 2,800 residential units. TheLong Ping development, with a floor area of about 2.2million sq.ft, would provide more than 3,100 residential units (Sing Tao Daily, 1998). Roving exhibition held in East Rail Hung Hom Station and Central Station of the MTR Island Line (KCRC, 1998b). 	
	December	Project Initiation	 Roving exhibition held in East Rail Mongkok Station and Tuen Mun Town Plaza (KCRC, 1998b). KCRC invited expressions of interest for the detailed design contract for the Light Rail Alterations of West Rail Phase I (IMITI, 1998). 	
1999	January	Financing	 On 30 January, the chairman and chief executive of KCRC confirmed that the Corporation was set to borrow HK\$24bn on international capital markets to help fund the West Rail project, with fund-raising documentation being prepared over the next few months for bond issues both in Hong Kong and on international markets. Ideally any issue, expected to have a ten-year maturity, would not be made before the beginning of 2000. Further financing was also likely to come in the form of syndicated loans for bridging finance. Mr. Yeung said the Corporation might be able to raise HK\$3-5bn (Kohli, 1999). 	
	March	Implementation	 The construction contract for the Tsuen Wan Reclamation was awarded to the joint venture of China Harbour Engineering Co. and Costain Building & Civil Engineering Ltd of the UK on 23 March 1996. The reclamation was expected to commence in late March 1999, and be completed by October 2000 (DJIN, 1999a). Two system-wide contracts were also awarded in late March 1999. The contract for supplying electric multiple units (the trains) was awarded to the IKK consortium of Japan, which comprised Itochu Corporation, Kinkisharyo Corporation Ltd., and Kawasaki Heavy Industries; while the contract for train control and signaling was awarded to Alcatel Canada (KCRC, 1999b; XNA, 1999). 	
	April	Financing	• KCRC launched a HK\$10bn Note Issuance Programme to finance West Rail, Phase I (HKMA, 1999).	

Projec	roject Timeline				
	Мау	Contracts/ Tendering Issues	• KCRC extended the deadlines for contractors bidding for eleven construction contracts. The contractors claimed they needed extra time to prepare their lump-sum bids because of the huge extent of design changes issued since the documents were sent out. Deadlines were extended for an average of 2.5 weeks (Anonymous, 1999a).		
	June	Implementation	 Four civil construction projects for the viaducts and tunnel works were awarded to Maeda-Chun Wo Joint Venture, Zen Pacific-China State-Ngo Kee Joint Venture, and China State-Zen Pacific Joint Venture respectively (KCRC, 1999c; DJIN, 1999b). 		
	August	Implementation	The first West Rail Community Liaison Office opened in Mei Foo Sun Chuen (KCRC, 1999d).		
	September	Implementation	 Eight major civil construction contracts were awarded, including contracts for the construction of Yuen Long and Long Ping Stations, Tsuen Wan West Station, Nam Cheong Station, Kam Sheung Road Station and other track work contracts (KCRC, 1999d). 		
	October	Implementation	The commencement of construction work in Tuen Mun (KCRC, 1999e).		
	November	Implementation	CRC awarded the contract for the design, manufacturing, supply, installation, testing and commissioning of telecommunication systems for West Rail (DB-1500) to Siemens (Reuters News, 1999a).		
	December	Implementation	 KCRC awarded the contract for the design and supply of the fare collection system for West Rail to Alcatel SA (DJIN, 1999c), and the contract for the construction of the West Rail Depot building to Constain-China Harbour Joint Venture (Reuters News, 1999b). 		
2000	January	Implementation	 KCRC awarded the contracts for West Rail's Tunnel Ventilation System at a value of HK\$104.94m (XNA, 2000a). The commencement of construction work in Yuen Long; and Nam Cheong Station – the first wholly integrated KCR and MTR station in Hong Kong (KCRC, 2000a). 		
		Associated Development	• It was reported in the media that KCRC might reduce the area of the West Rail residential project at Long Ping station by about 10% (or 180,000 sq.ft). The site area of the project was 374,487 sq.ft, with a plot ratio of five (Sing Tao Daily, 2000).		
	March	Implementation	• The commissioning of West Rail's giant tunnel boring machine 'Mulan' – the largest tunnel boring machine ever used in Hong Kong (KCRC, 2000b).		
	May	Implementation	 The first viaduct span erected at the Kam Tin site (KCRC, 2000c). KCRC announced that the West Rail project was 16% complete. This included 20% of the viaducts, 39% of the tunnels, 13% of the stations, 10% of the EMU trains and 8% of the railway systems (XNA, 2000b). 		
		Financing	 KCRC signed a US\$42m export credit loan facility granted by the Export Development Council of Canada to partially fund the purchase of equipment from Alcatel Canada Inc. The 12-year loan facility would help finance about 85% of the purchase of a train control and signaling system for West Rail (DJIN, 2000a). 		
	September	Implementation	• On 26 September 2000, there was an incident in Tsuen Wan between owners of an industrial building,		

Projec	Project Timeline				
				which was to be resumed for the construction of West Rail, and police officers. A dispute over compensation for the owners delayed the resumption of the industrial building, and the owners did not receive the four-weeks grace period they demanded for moving out (Chan, 2000).	
	October	Implementation	•	First section of track laid for West Rail (Moss, 2003). Completion of West Rail's first major civil works contract – the Reclamation for Tsuen Wan West Station (KCRC, 2000d).	
	December	Implementation	•	Completion of the first West Rail station - Kam Sheung Road Station (Moss, 2003). On 13 December 2000, KCRC chairman and chief executive K Y Yeung said the West Rail project would be finished on time. He also suggested that the estimated cost of the project could be revised downwards significantly from HK\$51.7bn because of improvements in engineering technology and reduced tender prices. Costs were also helped by the reduction in the number of train carriages from 12 to nine, which cut the construction cost. He stressed that the progress of construction was relatively fast and there were no signs of postponement so far. He expected the trials on the line would occur before 2003 and full service would begin on 1 December 2003 (Hong Kong iMail, 2000). The government approved the extension of Light Rail Transit to Tin Shui Wai Reserve Zone, in order to provide a feeder service to the West Rail Tin Shui Wai station (Asia Pulse, 2000).	
2001	January	Implementation	•	A formal warning letter was issued to Siemens over the contractual delay of contract DB-1500. Software development was about six weeks behind schedule, and arrangements were made between KCRC and Siemens to subcontract the software supply to Optical Network Limited (ONL) (LEGCO, 2002a).	
	February	Implementation	•	By the end of February 2001, 37% of the project was complete, including 43% of the civil construction and 19% of railway construction (Ng, 2001).	
		Financing	•	KCRC revised the cost of West Rail downwards by 10% to HK\$46.4bn. This was the second time KCRC had revised the cost downwards, following the cost estimates of HK\$64bn in early 1999, and HK\$51.7bn in July 1999, of which the latter represented a 19.2% reduction compared to the original estimate. Ian Thoms, director of the West Rail project, said it was due to low inflation rates, cheaper tenders, lower financing costs and an effective cost-control system (Ng, 2001).	
	April	Implementation	•	Breakthrough of the West Rail Tai Lam Tunnel – the longest transportation tunnel in Hong Kong (Moss, 2003). Residents of Fung Chi Tsuen and Shui Tin Tsuen in Yuen Long complained that their houses were damaged by nearby West Rail construction work. The two villages were adjacent to the West Rail construction site, with Fung Chi Tsuen being split into halves by the rail alignment. Cracks on the walls and ceilings of their homes were observed, although KCRC claimed they had been following the matter up (Leung, 2001).	
	June	Implementation	•	The completion of West Rail's operational headquarters (KCRC, 2001b).	

Projec	Project Timeline			
		 The arrival of West Rail locomotives and works wagons (KCRC, 2001b). 		
	July	Implementation	 KCRC chief K Y Yeung said the HK\$18bn saved in West Rail's construction would not be passed on to commuters. Instead, it should go to the East Rail extension project. Also, he said West Rail's final fare structure would depend on the outcome of a survey to gauge user support and transport competition, such as buses (Hong Kong iMail, 2001a). Breakthrough of West Rail Tsing Tsuen Downtrack Tunnel – the final tunnel to be completed for the West Rail project (Moss, 2003). 	
	September	Implementation	 On 25 September 2001, the director of West Rail Ian Thoms confirmed that West Rail was 55% complete, and it would be possible to begin services earlier than planned (Hong Kong iMail, 2001b). The piling and foundation construction of Tai Lam tunnel was 91% complete; the construction of the rail viaduct, mainly near Yuen Long, Tin Shui Wai and Tuen Mun, was 91% complete; 30% of the rail tracks were laid, and 55% of the nine West Rail stations were complete (Hong Kong iMail, 2001b). 	
	November	Implementation	 Completion of Tuen Mun Station – the terminus station of West Rail and Hong Kong's first railway station over water (KCRC, 2002a). 	
	December	Implementation	West Rail Viaduct completed (KCRC, 2002a).	
		Corporate Governance	• KCRC (Amendment) Bill 2001 was passed to separate the two posts of Chairman and Chief Executive Officer, and Michael Tien was appointed as the new KCRC Chairman (Au, 2005).	
2002	January	Implementation	Completion of Pat Heung Maintenance Centre (KCRC, 2002a).	
		Financing	 Press reports emerged regarding KCRC's payment of HK\$100m to Siemens despite contractual delays by Siemens on the telecommunication system contract (DB-1500) (Au, 2005). The Chief Executive of Hong Kong SAR Tung Chee-hwa said the government would closely monitor an investigation into the incident (Reuters News, 2002a). A KCRC spokeswoman said costs on Siemens' HK\$287m contract were underestimated after a subcontractor failed to deliver the system as promised, and KCRC agreed to the additional payment in order to ensure that West Rail would be finished on time. She also stressed that even with the additional payment to Siemens, the cost was still substantially lower than the next lower bid (Reuters News, 2002a). The Management Board of KCRC appointed KPMG, its external auditor, to investigate the incident (LEGCO, 2002a). 	
	February	Financing	 KCRC formed a committee to supervise the investigation into contract overruns to eliminate any perception of a conflict of interest. The responsibility of the supervisory committee would be to supervise the investigations by KPMG into the contract delay and cost overruns of the Siemens telecommunication system contract for West Rail, as KPMG was the auditor for both KCRC and Siemens AG. There were four independent members: John Swaine, former president of LEGCO, Lee Chack Fun, a University of Hong Kong professor, Thomas Brian Stevenson, former president of the Hong Kong Society of Accountants and 	

ject Timeline		
		Denis Levett, former chairman of the Royal Institution of Chartered Surveyors in Hong Kong (Reuters News, 2002b).
	Implementation	Completion of Siu Hong Station (KCRC, 2002b).
March	Financing	 Ernst & Young took over the independent investigation of the contract overruns from KPMG, after KCRC declined a request from KPMG to protect any parties named in the report from claims over losses. On top of this, KPMG was also an auditor for Siemens AG and so it was deemed more appropriate to avoid a potential conflict of interest by appointing another investigator (DJIN, 2002).
	Implementation	Completion of Mei Foo Station (KCRC, 2002c).
April	Implementation	Delivery of the first West Rail train in Hong Kong (Moss, 2003).
May	Financing	 The independent report by Ernst & Young (EY) suggested that KCRC was justified in paying an additiona HK\$100m to Siemens, which was running the risk of not meeting its contractual deadline, as KCRC could not terminate the contract with Siemens either under the contract or under common law. The report said the Siemens contract was closely interrelated with other West Rail contracts and KCRC was correct in taking into account the consequences for the project as a whole. However the report pointed out that KCRC management had failed to alert its board to the potential delays early enough. Regarding the 27 similar agreements to pay an extra HK\$1.54bn to other contractors, EY said such practices were nor unusual and were considered essential for large construction projects. The report did not identify any individuals responsible for these shortcomings and did not recommend any specific actions to be taker (DJIN, 2002). KCRC apologised for keeping its management board in the dark about hundreds of millions of dollars in cost overruns on key construction contracts and promised to improve its monitoring and reporting practices. KCRC Chairman Michael Tien admitted misjudgments by managers, but denied any wrongdoing. Michae Tien, together with KCRC chief executive K Y Yeung, senior director of capital projects James Blake and West Rail director Ian Thoms said they would take full responsibility for the misjudgment on delaying reporting to the board (Lawder, 2002). Extra payments were also made for the contract delays: HK\$255m extra on the HK\$1.39bn Tuen Mur station contract; and HK\$103m extra on the HK\$1.24bn Mei Foo station contract (Lawder, 2002).
	Implementation	 Completion of Yuen Long Station and Long Ping Station (KCRC, 2002d). Testing and commissioning of West Rail commenced (Moss, 2003).
June	Implementation	Completion of Tsuen Wan West Station (KCRC, 2002d).
August	Implementation	Laying of West Rail tracks completed (Moss, 2003).
December	Implementation	Pre-operation community programme launched in Tuen Mun, Yuen Long, Kwai Tsing, Tsuen Wan and Sham Shui Po. Other community partnership and consultation programmes, such as meeting with the relevant District Councils, 'West Rail Café' and roving exhibitions were also planned for the coming months.

Project	Project Timeline			
			(KCRC, 2003a; 2003b).	
	February	Implementation	• 94% of West Rail was completed (XNA, 2003).	
		Corporate Governance	• KCRC announced that they would integrate the management of West Rail and Light Rail into a new division for better integration of West Rail and Light Rail services in the North West New Territories (XNA, 2003).	
	Мау	Implementation	• KCRC announced that due to the economic downtown, a fare discount of 10% for trips between North West New Territories and urban Kowloon would be introduced (KCRC, 2003c).	
	June	Implementation	 The largest of the nine West Rail Stations, Nan Cheong Station, was complete, and the trial for West Rail commenced. The station is the southern terminus of West Rail (KCRC, 2003b). Commencement of the pre-launch trial operations (KCRC, 2003b). 	
	August	Implementation	• KCRC announced that it would introduce a further 10% discount for trips between North West New Territories and urban Kowloon, as well as trips within North West New Territories and urban Kowloon for at least a year after West Rail opens (KCRC, 2003c).	
	September	Implementation	• Community outreach programmes such as Community Briefings, visits to West Rail Stations, TV documentary and publicity in print media were launched (KCRC, 2003c).	
	October	Implementation	 An emergency exercise was carried out in West Rail Tai Lam Tunnel (KCRC, 2003d). KCRC announced that it had to postpone the opening of West Rail until the end of 2003 due to software and hardware problems (AFX Asia, 2003a). 	
	December	Implementation	 On 8 December 2003, it was reported that KCRC would apply for an operating license for West Rail, an indication that the service would commence soon (AFX Asia, 2003b). After a three-day trial run, KCRC said extra staff would be employed to assist passengers and control crowds (Yau, 2003). On 20 December 2003, West Rail commenced service, linking up the mass rapid transit network between urban Kowloon with North West New Territories (KCRC, 2005). 	
2004	June	Associated Development	 The average daily patronage for West Rail was between 100,000 and 110,000, much lower than KCRC's projection of 200,000. Slower population growth in the Northwest New Territories and Hong Kong's economic downturn were blamed for lower-than-expected passenger figures for West Rail. In response, KCRC lowered the fare for West Rail (Ng, 2004). KCRC was still awaiting approval from the Government for the associated property development along West Rail, and stressed there was no timetable for the completion of the associated development yet. This statement was made a day after the Government said KCRC's plan to call for tenders next year for the developments had yet to be approved (AFX Asia, 2004). 	
2005	April	Associated Development –	• Eight real estate companies expressed interest in the property development of Nam Cheong Station. The site of 46,200m ² would yield about 369,600m ² of gross floor area, including 300,300m ² of residential	

Project	roject Timeline			
		Nam Cheong station	development, 27,600m ² of retail development and 41,460m ² of office space. A total of 4,247 flats were planned to be built (AFX Asia, 2005a).	
	June	Associated Development – Tsuen Wan West station	• The Town Planning Council reviewed KCRC's West Rail Tsuen Wan station construction plan, which may be modified to include hotel and retail space, and with a relative decrease in residential floorspace in order to adjust to market demand (Tai Kung Pao, 2005).	
	August	Associated Development – Tuen Mun station	• KCRC said Cheung Kong (Holdings), Sun Hung Kai Properties, Henderson Land and seven other developers had submitted expressions of interest to become a joint venture partner in KCRC's residential project at West Rail Tuen Mun station (AFX Asia, 2005b).	
	September	Associated Development - Nam Cheong station and Yuen Long station	 Tenders for the West Rail developments of Nam Cheong station and Yuen Long station were put on hold after residents of the districts complained that they were poorly designed (Ng and Wong, 2005). 	
	November	Associated Development – Tuen Mun station	• KCRC received a tender from Cheung Kong (Holdings)'s wholly owned subsidiary, Creston Investment Ltd, for the joint venture development of a property project for the West Rail Tuen Mun station. The project would be due for completion in 2012, and would be developed in two phases (AFX Asia, 2005c).	
	December	Associated Development – Tuen Mun station	• KCRC rejected the tender from Creston Investment Ltd for the West Rail Tuen Mun station development, and would re-invite property developers to submit expressions of interest again as soon as possible. This was due to the high land premium demanded by the government at the time, which in turned failed to attract enough bidders for the development (AFX Asia, 2005d; Reuters News, 2006).	
2006	July	Associated Development – Tuen Mun station	• Four major property firms had submitted their bids for the Tuen Mun station property development, KCRC said. Contracts would be awarded in the third quarter of 2006 and were expected to be completed in 2013 (Reuters News, 2006).	
	August	Associated Development – Tuen Mun station	 KCRC awarded the property development project above West Rail Tuen Mun station to Sun Hung Kai Properties Ltd (Reuters News, 2006). 	
	September	Associated Development – Tsuen Wan West	 KCRC invited expressions of interest for the property development of Tsuen Wan West station (AFX Asia, 2006). 	

Project	roject Timeline			
	October	Associated Development – Tsuen Wan West	 KCRC received 13 expressions of interest for the Tsuen Wan West station associated property development (Wang, 2006). 	
2007	April	Associated Development – Tsuen Wan West	 KCRC said three tenders were received for the property development of Tsuen Wan West station, including Cheung Kong (Holdings), Sun Hung Kai Properties and Henderson Land Development (XFN, 2007). 	
	December	Merger of KCRC and MTRC	 The merger of Kowloon-Canton Railway Corporation (KCRC) and Mass Transit Railway Corporation Limited (MTRCL). The name of MTRCL was retained. (MTRC, 2008). 	
2008 September Associated Development – Tsuen Wan West • Queensway Investments, a subsidiary of Cheung Kon station TW7 property development project (ENN, 2008		Associated Development – Tsuen Wan West	 Queensway Investments, a subsidiary of Cheung Kong (Holdings), won the tender for the Tsuen Wan West station TW7 property development project (ENN, 2008). 	
	November	Associated Development – Nam Cheong station and Yuen Long station	 The government decided to reduce development density at Nam Cheong station by 18%, and at Yuen Long station by 15%. The move was a consequence of public concerns expressed that the property development might create a barrier preventing air flow in the respective districts. Nevertheless, the reductions were criticised as insufficient by the public and environmentalists (Wong and Ng, 2008). 	

Figure 9: West Rail Project Phase I Milestones



Project key issues

The project timeline shows the lengthy planning, financing and implementation process for the West Rail. The main issues emerging from the timeline are:

Contract agreements, tendering and financing

Incident 1: Contract tendering process for the West Rail technical studies

In August 1996, it was revealed that KCRC did not arrange for open tenders for the engineering technology consultancy contracts, which led to a request to the Government and KCRC by the Subcommittee for a report regarding the incident (LEGCO, 1996g). On 6 September 1996, a special West Rail Subcommittee meeting was called after press reports on KCRC's revelation that consultancy firms over and above the 14 previously made known to the Subcommittee in the last meeting had been awarded with contracts without going through the open tender process. Kevin Hyde, the Chairman and CEO of KCRC at that time, admitted that there were 22 contracts awarded without tender. The Secretary of Transport restated that the Government would provide a report on this subject before the next Subcommittee meeting, and would not rule out the possibility of requesting the Chairman and the Board of KCRC to amend tendering principles and procedures (LEGCO, 1996h).

On 24 September 1996, the report regarding KCRC's award of consultancy contracts without tender was circulated in the West Rail Subcommittee special meeting. Fifty-one contracts were awarded through single tender. The report concluded that KCRC's tendering policies were generally in line with those of Government and other organisations covered in the study, while the Administration disagreed with the management decision in 1989 to exclude consultancy from the corporate tendering policy, on grounds of flexibility. The Government concluded that drastic changes to KCRC's tendering policies and procedures were not deemed necessary, but certain adjustments aimed at introducing more checks and balances were recommended (LEGCO, 1996i). In October 1996, KCRC announced the re-tendering of all core consultancies (LEGCO, 1996j). Ian McPherson, the Director of West Rail division of KCRC, denied that this was due to pressure from LEGCO. "Those contracts were all awarded through tender. It was also our original plan to re-tender the core consultants for the detailed design studies because the work is different from that of the technical studies" (Hon, 1996e).

Incident 2: KCRC's handling of the contract for the West Rail telecommunications systems awarded to Siemens and the 27 supplemental agreements with contractors for 18 West Rail contracts for HK\$1.6bn

KCRC agreed to pay Siemens HK\$100m for variations, settlement of claims and recovery of time lost for the West Rail contract DB-1500 – telecommunication systems. This stirred up widespread public concern, as the general public felt an extra HK\$100m should not be paid to Siemens as compensation for Siemens' own fault. The administration requested KCRC to investigate into KCRC's tender evaluation and contractual performance monitoring systems on 29 January 2002 (LEGCO, 2002a). The management board of KCRC appointed KPMC, and subsequently Ernst & Young, to undertake the investigation. The investigation would also cover the 27 supplemental agreements with contractors for 18 West Rail contracts. KCRC's Chairman clarified that of the HK\$100m, HK\$35m was a legitimate contractual entitlement for Siemens, while the remaining HK\$65m was for introducing delay recovering measures to re-establish key dates (LEGCO, 2002a).

The tender evaluation system was also questioned after the incident, as the tender submitted by Siemens for DB-1500 was significantly lower than the second lowest bidder, whilst KCRC did not use the 70:30 weighting for assessing the technical and financial

aspects of tenders and was accused of not critically evaluating all aspects of the tender to safeguard the interests of the Corporation. KCRC said there was no technical and financial weighting, and that evaluation of each tenderer would confirm whether they had the ability, technically and financially, to undertake the contract. KCRC had to follow the Word Trade Organisation Agreement on Government Procurement and to award the contract to Siemens, as it was the lowest bidder (LEGCO, 2002a).

It was revealed during the investigation that in January 2001, a formal warning letter was issued to Siemens over the contractual delay of contract DB-1500, as the software development was about six weeks behind schedule. Arrangements were made between KCRC and Siemens to subcontract the software supply to Optical Network Limited (ONL). However, ONL and Siemens did not get along and the personnel in charge of the contract on Siemens' side did not fully inform KCRC of the issues between ONL and Siemens. KCRC subsequently insisted on replacing that particular individual (LEGCO, 2002a). LEGCO members guestioned whether KCRC should have re-tendered DB-1500 instead, while KCRC replied that they had already considered re-tendering during the process. KCRC said according to the legal advice obtained, Siemens' failure to meet certain milestones did not in itself constitute a breach of contract as Siemens was able to deliver the remaining four systems under the contract. Therefore, KCRC had insufficient ground to terminate its contract. The delay in the telecommunication systems would delay the opening of West Rail and subsequently result in a loss of revenue for KCRC. Also, since the West Rail contracts were linked with one another, the delay in the telecommunication systems would lead to claims from other contractors. Therefore negotiating a settlement with Siemens seemed to be a justified action by KCRC (LEGCO, 2002a).

An independent report by Ernst & Young (EY) suggested that KCRC was justified in paying an additional HK\$100m to Siemens, which was running the risk of not meeting its contractual deadline, as KCRC could not terminate the contract with Siemens either under the contract or under common law. The report said the Siemens contract was closely interrelated with other West Rail contracts and KCRC was correct in taking into account the consequences for the project as a whole. However the report pointed out that KCRC's management had failed to alert its board to the potential delays early enough. Regarding the 27 similar agreements to pay an extra HK\$1.54bn to other contractors, EY said such practices were not unusual and were considered essential for large construction projects (DJIN, 2002; KCRC, 2002f).

KCRC apologised for the failure to inform the management board about the cost overruns on key construction contracts and promised to improve its monitoring and reporting practices. KCRC's Chairman Michael Tien admitted misjudgments by managers, but denied any wrongdoing. Michael Tien, together with KCRC chief executive K Y Yeung, senior director of capital projects James Blake and West Rail director Ian Thoms said they would take full responsibility for the misjudgment on delaying reporting to the board (Lawder, 2002).

Key points emerging from the two incidents regarding contractual arrangements

The first incident involved the loose tendering procedures for the West Rail technical studies contracts, while the second incident eventually lead to the questioning of the existing tender evaluation system and procedures. With KCRC having no prior experience in construction and management of large scale complex construction projects since it was established as a railway operating company, the incidents showed the possible inadequacy of KCRC in handling contractual matters regarding constructing large-scale complex railway projects.

Staffing issue: KCRC vs. outside consultants

From day 1, the West Rail division of KCRC was filled mainly by outside consultants. It was revealed that 70% of the senior posts in the West Rail division of KCRC were filled by outside consultants, which created concerns among some LEGCO members that KCRC did not have the expertise to run the project, and that there was a lack of supervision of expatriate consultants (Hon, 1996b). They were also concerned about the issue of technology transfer from outside consultancies to local KCRC staff, if KCRC relied too much on outside consultancy staff. While KCRC planned to slash staff working on West Rail, who were mostly employed by International Bechtel, as the technical studies were scaled down in late 1996, the media and public accused KCRC of appeasing the legislator instead of their 'stated intention' (Hon, 1996c).

On 19 December 1996, KCRC announced that they would need to hire an extra 160 advisors from consultants, including those who had been laid off in November, in order to meet the tight deadlines (SCMP, 1996). A month later, the chairman of KCRC announced that a quarter of the consultant staff employed in the KCRC West Rail division would become permanent staff on local terms. At that time, the West Rail division comprised 13 KCRC staff and 189 consultants from Pacific Bechtel. After restructuring, there would be a huge increase in the number of KCRC staff to 158, with Bechtel staff numbers falling to 111. The ratio of KCRC staff to Pacific Bechtel staff would be one to one. The number of staff for the West Rail division would also rise for phase two of the technical studies (Hon, 1997a). The media suggested that it was a move for KCRC to gain more control over the project.

The return of sovereignty of Hong Kong to China: 1997 (British Hong Kong Government vs. Chinese Hong Kong SAR Government)

The unique historical situation of Hong Kong made the planning, financing, and evaluation process of West Rail very complex. As most of the decision making and project appraisal for West Rail were made prior to 1997 by the 'British Hong Kong Government' and the actual realisation of the project would be carried out by the 'Chinese Hong Kong Government' (Hong Kong SAR Government), the Chinese government officials, throughout the planning and appraisal process of West Rail, had to be acknowledged with regard to its progress. Also, as the original concept of Western Corridor Railway included a freight rail connecting Kwai Chung Container Terminal to mainland China and a cross-boundary passenger railway (both now belonging to West Rail Phase II), co-ordination with transport planning on the Chinese side was deemed essential. It was the view of both the Hong Kong SAR government and the mainland Chinese government that as little progress had been made regarding the feasibility of building West Rail Phase II, West Rail Phase I should proceed in order to avoid further delay for the project, especially considering the financial implications for the Chinese/HKSAR government after 1997.

E PROJECT FUNDING/ FINANCING

Introduction

The West Rail Phase I is a project carried out by the Kowloon-Canton Railway Corporation, which is a public corporation. The financing arrangement for West Rail by KCRC is relatively straightforward, while information regarding the funding and financing of the West Rail project in the public domain is relatively limited.

The main components of the funding package are the KCRC notes issurance programme, KCRC internal funds, and government equity injection (in exchange for KCRC shares).

Background to funding/financing

According to the Project Agreement between KCRC and the Hong Kong Government in 1998, KCRC is responsible for financing, design, construction and operation of the West Rail. KCRC would be solely responsible for all construction costs, using internal funds. The West Rail Project Agreement also stated that the Government would inject HK\$29bn into the West Rail project, in exchange for share holdings in West Rail. The shares issued to the Government would be new shares (LEGCO, 1998a).

Clause 2.1	The Corporation will finance the full amount of the Capital Cost.
Clause 2.2	The Capital Cost Estimate and the Financial Projections set out in Appendices 3 and 4 respectively to the Project Agreement are for illustrative purposes only and are not binding.
Clause 2.3	Government will provide full cooperation to the Corporation in respect of all reasonable requirements for information or assistance of a non-financial nature to enable the Corporation to finance the completion of West Rail.
Clause 3	The Corporation will apply its internal funds towards meeting the Capital Cost. Such internal funds include the property development profits accrued in respect of the East Rail and the Light Rail for the developments but exclude accumulated operational profits. Government will procure that the required approval is given under the Ordinance for such application.
Clause 4	The Corporation will, when it thinks fit, raise and maintain commercial financing to finance the balance of the total costs of works required to complete West Rail which are not met by internal funds and the total equity contributions made or to be made by Government. Government will not, for as long as there remain outstanding any amounts in respect of such commercial financing, give any direction to the Corporation under the Ordinance to carry its profits to any reserve funds.
Clause 5	Government will inject equity of \$29bn for West Rail in two stages before 31 March 2000 and receive shares in return. All equity will be fully paid up. The KCRC Ordinance provides for shares of \$100,000 each. The \$29bn new capital to be paid for new shares is required to be paid on the date of allotment of the relevant shares.

Table 12: West Rail Project Agreement: Financing West Rail – Clauses Explanation

Source: LEGCO (1998b)

Overview of key stages in funding/financing approach

<u>November 1995</u>: In the financial analysis presented in the full proposal for the Western Corridor Railway Project submitted by KCRC, it was indicated that West Rail was financially viable while the capital expenditures required for the implementation of the project as proposed by 2001 were beyond the resources of KCRC independent of Government support. The proposal suggested that a reasonable level of government financial support was needed, and the plan to raise substantial debt in the international financial market (KCRC, 1995).

<u>February 1998</u>: The Finance Committee of LEGCO approved a commitment of HK\$29bn Government equity injection for West Rail (KCRC, 1998b).

May 1998: The first installment of government equity injection (HK\$14.5bn) (LEGCO, 1998b).

<u>April 1999</u>: KCRC launched two separate note issuance programmes to finance West Rail and other railway projects (HKMA, 1999).

Late 1999: The second installment of government equity injection (HK\$14.5bn) (LEGCO, 1998b).

Further investigation for funding at later stages is needed, as very limited information is available in the public domain.

Funding sources

July 1999 (Briginshaw, 2000)							
Cost HK\$bn Source of funds HK\$bn							
Capital	43.4	KCRC debt	10.9				
Land	7.0	KCRC funds	11.8				
Financing	1.3	Government equity	29				
Total	51.7	Total	51.7				
2001 (KCRC, 200	2001 (KCRC, 2002e)						
Cost	HK\$bn	Source of funds	HK\$bn				
Capital	39.8	KCRC debt	5.5				
Land	6.0	KCRC funds	11.9				
Financing	0.6	Government equity	29				
Total	46.4	Total	46.4				

Table 13: A summary of West Rail funding sources

Source: Briginshaw (2000), KCRC (2002e)

Main elements/structure of financing package

Government equity injection

The Finance Committee of the Provisional Legislative Council approved a commitment of HK\$29bn Government equity injection for West Rail (KCRC, 1998b). The Government's plan for equity injection for West Rail was to inject the equity into KCRC by two equal installments of \$14.5bn each, with the first in May 1998 and the second approximately a year later (LEGCO, 1998b).

The Government also carried out some essential public infrastructure works throughout the construction period of WR in the order of \$3,135m in 1997 prices to enable West Rail to be open to the public. Such works included the provision of feeder roads, construction of public transport interchanges, and reclamation. They were entrusted to KCRC and their costs would be reimbursed by Government, through funding from the Capital Works Reserve Fund (LEGCO, 1998b).

Note Issurance Programme

KCRC planned two separate note issuance programmes to finance West Rail and other railway projects. The first programme was a HK\$10bn Note Issuance Programme arranged by the Hong Kong Monetary Authority with Bermuda Trust (Far East) Ltd as the trustee. This programme allows KCRC from time to time to issue fixed rate or floating rate Hong Kong dollar notes with maturities of up to ten years (KCRC, 1999c).

The second programme is a US\$1.5bn Medium Term Programme which allows KCRC to issue debt securities in various currencies, interest rate structures, and maturities in the international capital markets. The programme is jointly arranged by HSBC Markets and Morgan Stanley Dean Witter. In addition, seven other dealers will support the programme to provide a worldwide distribution network (KCRC, 1999c).

KCRC internal funds

The HK\$10.1bn internally generated fundsmostly comes from property development profits along East Rail and Light Rail as well as interest earnings (KCRC, 1998b).

F OPERATIONS

Ridership

The following table shows the average daily patronage of West Rail since its opening in December 2003.

	No. of passengers (million)	Passenger Trips	Source
2004	48	131,500	KCRC (2005)
2005	65	179,200	KCRC (2006)
2006	73	200,100	KCRC (2007,2008)
2007	71 (Jan - Nov 07)	213,300	KCRC (2008)
2008	West Rail became part of the MTR network after the Rail Merger in December 2007, and separate figures for ridership for the West Rail Line are not available in the public domain.		

Source: KCRC (2005, 2006, 2007, 2008)

Commentary on ridership

In 1995, KCRC estimated the average daily patronage for West Rail would be above 300,000 in 2001 (the first year of opening according to the original plan) (KCRC, 1995). In 1997, both KCRC and the Government's consultants projected that ridership on the overall system would exceed 800,000 passengers per day by 2011 (KCRC, 1997a). In 1999, the average daily patronage of West Rail for 2003 was forecast to be 340,000 while the forecast for 2005 was 500,000 (Anonymous, 1999b). Compared to the actual figures shown above, the actual ridership of West Rail has been significantly lower than the estimated figures.

G BIBLIOGRAPHY

AFX Asia (2003a) *HK's KCRC to Delay West Rail Opening to End-2003.* AFX Asia. 21 October 2003.

AFX Asia (2003b) Hong Kong's KCRC to Apply for West Rail Operating Licence. AFX Asia. 8 December 2003.

AFX Asia (2004) Hong Kong's KCRC Awaits Government Approval on Property Development. AFX Asia. 23 June 2004.

AFX Asia (2005a) *Hk's KCRC Says Cheung Kong, Sun Hung Kai Interested in Nam Cheong Station Development.* AFX Asia. 29 April 2005.

AFX Asia (2005b) *HK's Cheung Kong, Sun Hung Kai, Others in Race for Kcrc Property Devt Project.* AFX Asia. 5 August 2005.

AFX Asia (2005c) *Hk's KCRC Receives Tender from Cheung Kong Unit for West Rail Tuen Mun Project.* AFX Asia. 25 November 2005.

AFX Asia (2005d) Hong Kong's KCRC Re-Invites Developers to Join West Rail Tuen Mun Project. AFX Asia. 12 December 2005.

AFX Asia (2006) Hong Kong Kcrc Invites Developers to Express Interest in Tsuen Wan West. AFX Asia. 13 September 2006.

Anonymous (1999a) 'Hong Kong Grants Firm's Request to Extend Bid Date'. *Engineering News-Record*. 242 (20)

Anonymous (1999b) 'West Rail Feature'. *Asian Architect and Contractor.* 28 (8), pp.13-25

Anonymous (2000) 'Traveling into the Future: West Rail Special Part 1'. *Asian Architect* and Contractor. 29 (11), pp.11-38

Asia Pulse (2000) *Hong Kong to Extend Light Rail System in New Territories*. Asia Pulse. 18 December 2000.

Au, L. K. (2005) 'The Governance of Government-Owned Railway Organisations in Hong Kong: Integration and Autonomy in Changing Times.', PhD thesis, The University of Hong Kong.

Blessis, D. (2000), 'West Rail: A Project Profile', *Journal of Geospatial Engineering*, Vol. 2, No. 1, pp. 57-65.

Briginshaw, D. (2000). 'West Rail On Schedule To Open In Late 2003', *International Railway Journal*, March 2000, pp. 18-21

Chamber News Network (CNN) (1998) *KCRC Earning Boost*. Hong Kong News Digest. 1 February 1998.

Chamber World Network (CWN) (1999) *Air at the End of the Tunnel - Hong Kong*. Asian Review of Business and Technology. 17 December 1999.

Chan, E. (2000) KCRC Blamed for Land Clash. Hong Kong iMail. 27 September 2000.

Chan, P. (1997) KCRC to Borrow \$30b to Finance West Rail Project. South China Morning Post. 19 September 1997.

Chan, Q. (1996) *\$40b West Rail Cut Offered*. South China Morning Post. 18 September 1996.

Cheng, C. (1997) *Transport Officials to Inform Pc About West Rail Changes*. Hong Kong iMail. 10 January 1997.

Delfino, B. (1996) *Former Official to Tackle West Rail Challenge*. South China Morning Post. 12 December 1996.

Delfino, B. (1997a) Lai Chi Kok Leisure Facilities Threatened by Bid to Cut Down Noise West Rail Project to Hit Park. South China Morning Post. 8 August 1997. August 1997.

Dow Jones International News (DJIN) (1996a) *HK's KCRC Says West Rail Delays Won't Affect Borrowing*. Dow Jones International News. 15 October 1996.

Dow Jones International News (DJIN) (1996b) *Hk's Kcrc Says West Rail Delays - 4: China Role.* Dow Jones International News. 15 October 1996.

Dow Jones International News (DJIN) (1998a) *Kowloon-Canton Railway Awards 5 West Rail Design Contracts*. Dow Jones International News. 2 March 1998.

Dow Jones International News (DJIN) (1998b) *HK's Kowloon Canton Rail Awards 8 Pacts Valued at Hk\$70m.* Dow Jones International News. 18 June 1998.

Dow Jones International News (DJIN) (1998c) *HK Railway Corp Awards Three Foundation Test Contracts*. Dow Jones International News. 22 July 1998.

Dow Jones International News (DJIN) (1998d) *HK Kowloon-Canton Rail to Prefer Local Cos in West Rail Proj.* Dow Jones International News. 31 July 1998.

Dow Jones International News (DJIN) (1998e) *HK Govt Authorizes Construction of Hk*\$64b Railway Project. Dow Jones International News. 15 September 1998.

Dow Jones International News (DJIN) (1999a) *Sino-Europe Jv Gets Hk*\$256.8*m West Rail Reclamation Contract.* Dow Jones International News. 23 March 1999.

Dow Jones International News (DJIN) (1999b) *HK Kowloon-Canton Railway Awards Hk*\$3.7*bln Contracts*. 25 June 1999.

Dow Jones International News (DJIN) (1999c) *Alcatel Gets Eur45 Mln Contract for Hong Kong Metro*. Dow Jones International News. 14 December 1999.

Dow Jones International News (DJIN) (2000a) *HK's Kowloon-Canton Rail Gets US\$42 Million Export Credit Loan*. Dow Jones International News. 27 June 2000.

Dow Jones News Service (DJNS) (1997) *ICF Kaiser Gets 2 Hong Kong Rail Pacts Valued at \$5m.* Dow Jones News Service. 8 July 1997.

ET Net News (ENN) (2008) *Cheung Kong (00001) Wins MTRC's (00066) Tsuen Wan Project.* ET Net News. 12 September 2008.

ERM-Hong Kong (1998) West Rail: West Kowloon to Tuen Mun Centre: Final Assessment Report: Environmental Impact Assessment. Hong Kong: KCRC

Google. (2009) Google Earth. (5.0) [computer program] Google.

Highways Department, Hong Kong Government (2009) Existing Rail Lines. [Online]. Available at: http://www.hyd.gov.hk/eng/major/road/rail/index.htm (Accessed 15th June 2009)

Hon, M. S.-M. (1996a) West Rail Studies Soon. South China Morning Post. 20 July 1996. Hon, M. S.-M. (1996b) Kcrc Staff Occupy Just Six of 20 Key Positions. South China

Morning Post. 19 September 1996.

Hon, M. S.-M. (1996c) *KCRC Plan to Slash Rail Project Staff*. South China Morning Post. 22 October 1996.

Hon, M. S.-M. (1996d) *Consultant Sackings Confirmed by Kcrc*. South China Morning Post. 23 October 1996.

Hon, M. S.-M. (1996e) *KCRC to Re-Tender West Rail Consultancies*. South China Morning Post. 25 October 1996.

Hon, M. S.-M. (1996f) West Rail to Increase Staff in Long Term. South China Morning Post. 31 October 1996.

Hon, M. S.-M. (1996g) *West Rail Contracts Won by Firm Linked to Vocal Critic*. South China Morning Post. 1 November 1996.

Hon, M. S.-M. (1997a) *Local Terms for Staff*. South China Morning Post. 25 January 1997.

Hon, M. S.-M. and Delfino, B. (1997) *KCRC Seeks to Raise Control of West Rail*. South China Morning Post. 13 January 1997.

Hong Kong iMail (2000) Wildlife Fears over West Rail. Hong Kong iMail. 14 December 2000.

Hong Kong iMail (2001a) *Commuters Not in Line for \$18b, Says KCRC Chief.* Hong Kong iMail. 11 July 2001.

Hong Kong iMail (2001b) KCRC's West Rail First Phase Could Open Early. Hong Kong iMail. 26 September 2001.

Hong Kong Monetary Authority (HKMA) (1999) KCRC Launches Hk\$10 Billion Note Issuance Programme. [Online]. Available at:

http://www.info.gov.hk/hkma/eng/press/1999/990422e4.htm (Accessed 30 July 2009).

Hong Kong Legislative Council (LEGCO) (1993) *Official Record of Proceedings 7 July 1993.* [Online]. Available at: (Accessed 19 June 2009).

Hong Kong Legislative Council (LEGCO) (1994a) *Official Record of Proceedings 9 March 1994.* [Online]. Available at: (Accessed 19 June 2009).

Hong Kong Legislative Council (LEGCO) (1994b) *Official Record of Proceedings* 14 *December 1994.* [Online]. Available at: (Accessed 19 June 2009).

Hong Kong Legislative Council (LEGCO) (1996a) Legco Panel on Transport Subcommittee on Western Corridor Railway Project Minutes of the Meeting on Friday, 21 June 1996. [Online]. Available at:

http://www.legco.gov.hk/yr95-96/english/panels/tp/wcr/minutes/wc210696.htm (Accessed 19 June 2009).

Hong Kong Legislative Council (LEGCO) (1996b) Legco Panel on Transport Subcommittee on Western Corridor Railway Project Minutes of the Meeting on Friday, 28 June 1996. [Online]. Available at:

http://www.legco.gov.hk/yr95-96/english/panels/tp/wcr/minutes/wc280696.htm (Accessed 19 June 2009).

Hong Kong Legislative Council (LEGCO) (1996c) Legco Panel on Transport Subcommittee on Western Corridor Railway Project Minutes of the Meeting on Friday, 4 July 1996. [Online]. Available at:

http://www.legco.gov.hk/yr95-96/english/panels/tp/wcr/minutes/wc040796.htm (Accessed 19 June 2009).

Hong Kong Legislative Council (LEGCO) (1996d) Legco Panel on Transport Subcommittee on Western Corridor Railway Project Minutes of the Meeting on Friday, 12 July 1996. [Online]. Available at:

http://www.legco.gov.hk/yr95-96/english/panels/tp/wcr/minutes/wc120796.htm (Accessed 19 June 2009).

Hong Kong Legislative Council (LEGCO) (1996e) Legco Panel on Transport Subcommittee *on Western Corridor Railway Project Minutes of the Meeting on Friday, 19 July 1996.* [Online]. Available at:

http://www.legco.gov.hk/yr95-96/english/panels/tp/wcr/minutes/wc190796.htm (Accessed 19 June 2009).

Hong Kong Legislative Council (1996f) Legco Panel on Transport Subcommittee on Western Corridor Railway Project Minutes of the Meeting on Friday, 26 July 1996. [Online]. Available at:

http://www.legco.gov.hk/yr95-96/english/panels/tp/wcr/minutes/wc260796.htm (Accessed 19 June 2009).

Hong Kong Legislative Council (LEGCO) (1996g) Legco Panel on Transport Subcommittee on Western Corridor Railway Project Minutes of the Meeting on Friday, 2 August 1996. [Online]. Available at:

http://www.legco.gov.hk/yr95-96/english/panels/tp/wcr/minutes/wc020896.htm (Accessed 19 June 2009).

Hong Kong Legislative Council (LEGCO) (1996h) Legco Panel on Transport Subcommittee on Western Corridor Railway Project Minutes of the Special Meeting on Friday, 6 September 1996. [Online]. Available at:

http://www.legco.gov.hk/yr95-96/english/panels/tp/wcr/minutes/wc060996.htm (Accessed 19 June 2009).

Hong Kong Legislative Council (LEGCO) (1996i) Legco Panel on Transport Subcommittee on Western Corridor Railway Project Minutes of the Special Meeting on Friday, 24 September 1996. [Online]. Available at:

http://www.legco.gov.hk/yr95-96/english/panels/tp/wcr/minutes/wc240996.htm (Accessed 19 June 2009).

Hong Kong Legislative Council (LEGCO) (1996j) Legco Panel on Transport Subcommittee on Western Corridor Railway Project Minutes of the Meeting on Friday, 24 October 1996. [Online]. Available at:

http://www.legco.gov.hk/yr96-97/english/panels/tp/wcr/minutes/wc241096.htm (Accessed 19 June 2009).

Hong Kong Legislative Council (LEGCO) (1997a) Legco Panel on Transport Subcommittee on Western Corridor Railway Project Minutes of the Meeting on Friday, 24 January 1997. [Online]. Available at:

http://www.legco.gov.hk/yr96-97/english/panels/tp/wcr/minutes/wc240197.htm (Accessed 19 June 2009).

Hong Kong Legislative Council (LEGCO) (1997b) Legco Panel on Transport Subcommittee on Western Corridor Railway Project Minutes of the Meeting on Friday, 25 April 1997. [Online]. Available at:

http://www.legco.gov.hk/yr96-97/english/panels/tp/wcr/minutes/wc250497.htm (Accessed 19 June 2009).

Hong Kong Legislative Council (LEGCO) (1997c) Legco Panel on Transport Subcommittee on Western Corridor Railway Project Minutes of the Meeting on Friday, 13 May 1997. [Online]. Available at:

http://www.legco.gov.hk/yr96-97/english/panels/tp/wcr/minutes/wc130597.htm (Accessed 19 June 2009).

Hong Kong Legislative Council (LEGCO) (1998a) *財務委員會討論文件 - 資本投資基金* - 九 廣 鐵 路 公 司 「 西 鐵 第 一 期 」 . [Online]. Available at: http://www.legco.gov.hk/yr96-97/english/fc/fc/papers/fcpapers.htm (Accessed 29 July 2009). http://www.legco.gov.hk/yr97-98/english/panels/fa/papers/f12022aj.htm (Accessed 29 July 2009).

Hong Kong Legislative Council (LEGCO) (2002a) *Background Brief on Kowloon-Canton Railway Corporation West Rail Contract.* [Online]. Available at: http://www.legco.gov.hk/yr01-02/english/panels/tp/tp_rdp/papers/tp_rdp0516cb1-173 8-e.pdf (Accessed 29 July 2009).

Hong Kong Legislative Council (LEGCO) (2002b) *Investigation Report on Kcrc West Rail Contracts*. [Online]. Available at:

http://www.legco.gov.hk/yr01-02/english/panels/tp/tp_rdp/papers/tp_rdp0522cb1-17471e.pdf (Accessed 29 July 2009).

International Market Insight Trade Inquiries (IMITI) (1998) Hong Kong - West Rail Detailed Design Contract Opp'ties. International Market Insight Trade Inquiries. 31 December 1998.

Kelly, J. (1997a) Unsanctioned Railway Goes out to Tender. Hong Kong iMail. 8 August 1997.

Kelly, J. (1997b) *Rail Project 'Progressing Smoothly'*. Hong Kong iMail. 10 September 1997.

Kohli, S. (1999) *KCRC to Trawl Bond Markets for \$24b West Rail Funding*. South China Morning Post. 31 January 1999.

Kowloon-Canton Railway Corporation (KCRC) (1995) Western Corridor Railway Project : Full Proposal to Hong Kong Government : Executive Summary Hong Kong: KCRC.

Kowloon-Canton Railway Corporation (KCRC) (1996). *Annual Report 1995*, Hong Kong, Kowloon-Canton Railway Corporation.

Kowloon-Canton Railway Corporation (KCRC) (1997a). West Rail project brief – March 1997. Hong Kong, Kowloon-Canton Railway Corporation

Kowloon-Canton Railway Corporation (KCRC) (1997c). *Annual Report 1996.* Hong Kong, Kowloon-Canton Railway Corporation.

Kowloon-Canton Railway Corporation (KCRC) (1998a). West Rail project brief – February 1998. Hong Kong, Kowloon-Canton Railway Corporation.

Kowloon-Canton Railway Corporation (KCRC) (1998b). *West Rail project brief – May 1998.* Hong Kong, Kowloon-Canton Railway Corporation.

Kowloon-Canton Railway Corporation (KCRC) (1998c). *West Rail project brief – October 1998*. Hong Kong, Kowloon-Canton Railway Corporation.

Kowloon-Canton Railway Corporation (KCRC) (1998d). *Annual Report 1997.* Hong Kong, Kowloon-Canton Railway Corporation.

Kowloon-Canton Railway Corporation (KCRC) (1999a). *West Rail project brief – January* 1999. Hong Kong, Kowloon-Canton Railway Corporation.

Kowloon-Canton Railway Corporation (KCRC) (1999b). *West Rail project brief – April* 1999. Hong Kong, Kowloon-Canton Railway Corporation.

Kowloon-Canton Railway Corporation (KCRC) (1999c). *West Rail project brief – July 1999*. Hong Kong, Kowloon-Canton Railway Corporation.

Kowloon-Canton Railway Corporation (KCRC) (1999d). West Rail project brief – November 1999. Hong Kong, Kowloon-Canton Railway Corporation.

Kowloon-Canton Railway Corporation (KCRC) (1999e). West Rail project brief – December 1999. Hong Kong, Kowloon-Canton Railway Corporation.

Kowloon-Canton Railway Corporation (KCRC) (1999f). *Annual Report 1998.* Hong Kong, Kowloon-Canton Railway Corporation.

Kowloon-Canton Railway Corporation (KCRC) (2000a). West Rail project brief – March 2000. Hong Kong, Kowloon-Canton Railway Corporation.

Kowloon-Canton Railway Corporation (KCRC) (2000c). *West Rail project brief – July 2000*. Hong Kong, Kowloon-Canton Railway Corporation.

Kowloon-Canton Railway Corporation (KCRC) (2000d). West Rail project brief – November 2000. Hong Kong, Kowloon-Canton Railway Corporation.

Kowloon-Canton Railway Corporation (KCRC) (2000e). *Annual Report 1999.* Hong Kong, Kowloon-Canton Railway Corporation.

Kowloon-Canton Railway Corporation (KCRC) (2001a). West Rail project brief – March 2001. Hong Kong, Kowloon-Canton Railway Corporation.

Kowloon-Canton Railway Corporation (KCRC) (2001b). West Rail project brief – July 2001. Hong Kong, Kowloon-Canton Railway Corporation.

Kowloon-Canton Railway Corporation (KCRC) (2001c). West Rail project brief – November 2001. Hong Kong, Kowloon-Canton Railway Corporation.

Kowloon-Canton Railway Corporation (KCRC) (2001d). *Annual Report 2000.* Hong Kong, Kowloon-Canton Railway Corporation.

Kowloon-Canton Railway Corporation (KCRC) (2002a). *West Rail project brief – January 2002*. Hong Kong, Kowloon-Canton Railway Corporation.

Kowloon-Canton Railway Corporation (KCRC) (2002b). *West Rail project brief – March 2002*. Hong Kong, Kowloon-Canton Railway Corporation.

Kowloon-Canton Railway Corporation (KCRC) (2002c). *West Rail project brief – May 2002*. Hong Kong, Kowloon-Canton Railway Corporation.

Kowloon-Canton Railway Corporation (KCRC) (2002d). West Rail project brief – July 2002. Hong Kong, Kowloon-Canton Railway Corporation.

Kowloon-Canton Railway Corporation (KCRC) (2002e) Securities and Exchange Commission Form 20-F [Online]. Available at: http://sec.edgar-online.com/kowloon-canton-railway-corp/20-f-annual-and-transition-report-foreign-private-

issuer/2002/06/28/Section1.aspx (Accessed 31 July 2009).

Kowloon-Canton Railway Corporation (KCRC) (2002f) *Review of Payments to Contractors for the West Rail Project - Executive Summary*. [Online]. Available at:

http://www.legco.gov.hk/yr01-02/english/panels/tp/tp_rdp/papers/tp_rdp0516summay.pdf (Accessed 29 July 2009).

Kowloon-Canton Railway Corporation (KCRC) (2002g). *Annual Report 2001.* Hong Kong, Kowloon-Canton Railway Corporation.

Kowloon-Canton Railway Corporation (KCRC) (2003a). *West Rail project brief – January 2003*. Hong Kong, Kowloon-Canton Railway Corporation.

Kowloon-Canton Railway Corporation (KCRC) (2003b). *West Rail project brief – July 2003.* Hong Kong, Kowloon-Canton Railway Corporation.

Kowloon-Canton Railway Corporation (KCRC) (2003c). West Rail project brief – September 2003. Hong Kong, Kowloon-Canton Railway Corporation.

Kowloon-Canton Railway Corporation (KCRC) (2003d). West Rail project brief – November 2003. Hong Kong, Kowloon-Canton Railway Corporation.

Kowloon-Canton Railway Corporation (KCRC) (2003e). West Rail project brief – May 2003. Hong Kong, Kowloon-Canton Railway Corporation.

Kowloon-Canton Railway Corporation (KCRC) (2003f). *Annual Report 2002.* Hong Kong, Kowloon-Canton Railway Corporation.

Kowloon-Canton Railway Corporation (KCRC) (2004). *Annual Report 2003.* Hong Kong, Kowloon-Canton Railway Corporation.

Kowloon-Canton Railway Corporation (KCRC) (2005). *Annual Report 2004*, Hong Kong, Kowloon-Canton Railway Corporation.

Kowloon-Canton Railway Corporation (KCRC) (2006). *Annual Report 2005*, Hong Kong, Kowloon-Canton Railway Corporation.

Kowloon-Canton Railway Corporation (KCRC) (2008). *Annual Report 2007*, Hong Kong, Kowloon-Canton Railway Corporation.

Kowloon-Canton Railway Corporation (KCRC) (2009) Organisation Chart. [Online]. Available at: http://www.kcrc.com/en/about/ochart.html (Accessed 29 July 2009) Highways Department, Hong Kong Government (2009) Existing Rail Lines. [Online]. Available at: http://www.hyd.gov.hk/eng/major/road/rail/index.htm (Accessed 15th June 2009)

Lawder, D. (2002) *HK's KCRC Apologises on Rail Contract Cost Overruns*. Reuters News. 16 May 2002.

Leung, J. (2001) West Rail Blamed for Damage to Homes. Hong Kong iMail. 16 April 2001.

Lucas, L. (1998) *Borrowing Costs Grow for HK Railway Project*. Financial Times. 16 September 1998.

Moss, P. (2003). West Rail, Hong Kong, Kowloon-Canton Railway Corporation.

Mass Transit Railway Corporation (MTRC) (2008) Annual Report 2007. Hong Kong: MTRC.

Mass Transit Railway Corporation (MTRC) (2009) *MTR Properties - Tuen Mun.* [Online]. Available at: http://www.mtr.com.hk/eng/properties/westrail_tm.html (Accessed 15th June 2009)

Mass Transit Railway Corporation Limited (MTRCL) (2009) West Rail Line Property Development – Summary of Development Details. [Online]. Available at: http://www.mtr.com.hk/eng/properties/westrail_sdd.html (Accessed 15th June 2009)

Ng, K.-c. and Wong, F. (2005) *Residents Are Calling the Shots; Activism Is on the Rise as Tenants Show Their Opposition to Projects That Fail to Meet Their Standards*. South China Morning Post. 21 September 2005.

Ng, T. (2004) West Rail Blues Blamed on Slow Population Rise. The Standard. 3 June 2004.

Ng, V. (2001) West Rail Cost Cut Further to \$46.4b. Hong Kong iMail. 27 February 2001.

No, K.-Y. (1997) Green Light for West Rail. South China Morning Post. 17 January 1997.

Reuters News (1997) *HK's KCRC Sees Housing Development Along West Rail*. Reuters News. 8 July 1997.

Reuters News (1998a) *HK's KCRC Awards Deal to Nishimatsu, Dragages Jv.* Reuters News. 23 September 1998.

Reuters News (1998b) *HK Rail Firm Sets New Line Construction Schedule*. Reuters News. 12 October 1998.

Reuters News (1998c) *KCRC Awards West Rail Tunnel Contract.* Reuters News. 21 October 1998.

Reuters News (1998d) *Bouygues in Hong Kong Rail Tunnel Contract*. Reuters News. 26 October 1998.

Reuters News (1999a) *HK's KCRC Awards Contract to Siemens*. Reuters News. 25 November 1999.

Reuters News (1999b) Hong Kong's KCRC Awards Two West Rail Contracts. Reuters News. 23 December 1999.

Reuters News (2002a) *HK's KCRC Probes Hk*\$1.64 *Bln in Contract Overruns*. Reuters News. 30 January 2002.

Reuters News (2002b) *HK's KCRC Forms New Committee for Contract Probe*. Reuters News. 15 February 2002.

Reuters News (2006a). *Four Bidders Chase for KCRC Real Estate Project.* Reuters News. 28 July 2006.

SCMP (1997) *Contractors Told to Start Preparing Tenders for \$80b Construction Project.* South China Morning Post. 15 June 1997.

SCMP Staff Reporters (SCMP) (1996) West Rail Set to Take Back Newly Fired Consultants. South China Morning Post. 20 December 1996.

Sing Tao Daily (1998) *Govt Approves Two Home Projects. The Town Planning Board Has Approved a Residential/Commercial Development on Top of West Rail Tin Shui Wai Station.* Sing Tao Daily. 28 November 1998.

Sing Tao Daily (2000) *Hong Kong: West Rail Housing Project May Be Cut.* Sing Tao Daily. 29 January 2000.

Sing Tao Daily (2001) Hong Kong: Lower Construction Cost for Two Rails. Sing Tao Daily. 20 November 2001.

So, A. (1997) West Rail's Public Funds Undecided. Hong Kong iMail. 22 September 1997.

Tai Kung Pao (2005) *West Rail Tsuen Wan Station Include Hotel and Retail Space*. Tai Kung Pao. 7 June 2005.

Transport Department (1989). *Hong Kong Second Comprehensive Transport Study: Final Report*, Hong Kong, Government Printer.

Transport Branch (1994). *Railway Development Strategy 1994*, Hong Kong, Government Printer.

Wallis, K. (1996) *Top Firms Picked to Tender for West Rail*. South China Morning Post. 21 May 1996.

Wallis, K. (1998) *Eight Companies Register for \$10b Tunnel Contracts*. South China Morning Post. 6 April 1998.

Wong, B. W.-Y. (1998) *West Rail Vow on Work for Locals*. South China Morning Post. 16 June 1998.

Wong, J. S. (1996a) *KCRC Bullish on Freight Handling Forecasts*. South China Morning Post. 22 October 1996.

Wong, J. S. (1996b) *US Firm Stands by West Rail Forecasts*. South China Morning Post. 1 November 1996.

Wong, O. and Ng, J. (2008) West Rail Project Cut to Improve Air Flow Goverment Tipped to Lose over Hk\$2b. South China Morning Post. 19 November 2008.

Xinhua News Agency (XNA) (1998a) *Detailed Design Contracts Awarded for Hong Kong's West Rail Project.* Xinhua News Agency. 2 March 1998.

Xinhua News Agency (XNA) (1998b) *Detailed Contracts for HK's West Rail Project Signed*. Xinhua News Agency. 17 March 1998.

Xinhua News Agency (XNA) (1998c) 1st Stage Land Resumption for HK West Rail to Start. Xinhua News Agency. 16 October 1998.

Xinhua News Agency (XNA) (1999) *Hk, Japanese, Canadian Companies Sign Railway Systems Contracts*. Xinhua News Agency. 29 March 1999.

Xinhua News Agency (XNA) (2000a) *Contract for HK's West Rail Tunnel Ventilation System Awarded*. Xinhua News Agency. 27 January 2000.

Xinhua News Agency (XNA) (2000b) *West Rail 16 Percent Completed*. Xinhua News Agency. 30 May 2000.

Xinhua News Agency (XNA) (2003) *KCRC to Merge Management of West Rail, Light Rail.* Xinhua News Agency. 11 March 2003.

Xinhua Financial Network (XFN) (2007) *Hong Kong's Kcrc Receives 3 Tenders for Tsuen Wan West Station Property Project.* Xinhua Finance. 27 April 2007.

Yau, C. (2003) *Extra Staff Ready as West Rail Set to Roll*. The Standard. 20 December 2003.

Yuen, G. (1999) 'West Rail Phase I - Procurement Procedures and Construction Management', in Hong Kong and Shanghai Symposium on Science and Technology (1999). *Proceedings*. Hong Kong, The Hong Kong Institute of Engineers.