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West Island Line & South Island Line

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April 2004

Submitted by :

Mass Transit Railway Corporation Limited

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1. BASIC INFORMATION

1.1 Project Title

- 1.1.1 The project is known as the West Island Line and the South Island Line (WIL/SIL). Although the project title includes two “Lines” in its title, the two “Lines” comprise the one integrated project.

1.2 Purpose and Nature of the Project

- 1.2.1 The project will provide an electric powered rail based transport system to serve the west and the south of Hong Kong Island, the two major areas of population on Hong Kong Island which are not currently served by a rail based transport system. With the introduction of such a system, road traffic will be reduced with an overall improvement to the environment in terms of air quality, congestion, space utilization, safety and equity.

1.3 Name of Project Proponent

- 1.3.1 The project will be undertaken by the Mass Transit Railway Corporation Limited.

1.4 Location and Scale of Project and History of Site

- 1.4.1 The project extends for approximately 16 kilometres from Sheung Wan via Kennedy Town to Aberdeen and from Ap Lei Chau, past the lowland area of Ocean Park, to Admiralty. The Island Line will be extended from Sheung Wan to Sai Ying Pun where it will interchange with the West Island Line. The routes of the lines, which are all indicative, are shown on **Figure 1** and illustrate three possible routes for the South Island Line between the Ocean Park area and Admiralty.
- 1.4.2 Much of the route of the railway will be underground in tunnels constructed from shafts at station locations. Two sections of the route, at Cyberport and between Ap Lei Chau and the Ocean Park area, will be elevated. **Figure 2** indicates the intended form of construction along the route and for the 15 stations.
- 1.4.3 The elevated section at Cyberport is partially through a valley, recently cleared of hillside housing, while the remaining section skirts the reclamation on which the Cyberport development is being constructed. The elevated section between Ap Lei Chau and Ocean Park follows the Wong Chuk Hang Nullah alongside the industrial area.

1.5 Number and Types of Designated Projects

- 1.5.1 The WIL/SIL is a single project, comprising the following designated project elements as specified under A.2, A.4, A.7 and A.8 in Schedule 2 Part 1 of the Environmental Impact Assessment (EIA) Ordinance (Cap. 499):
- the WIL/SIL and its associated stations;
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- the WIL/SIL Depot;
- the WIL/SIL tunnels
- the WIL/SIL viaducts; and
- the WIL/SIL bridge crossing the Aberdeen Channel.

1.6 Contact Person and Details

1.6.1 For details of this Project Proposal please consult:

Dr Glenn Frommer
MTR Corporation
MTR Tower, Telford Plaza
33 Wai Yip Street
Kowloon Bay

Tel: 2993 3543

2. OUTLINE OF PLANNING AND IMPLEMENTATION PROGRAMME

2.1 Project Implementation and Timetable

2.1.1 The proposed timetable for the implementation of the project is:

Preliminary Project Agreement	30 September 2004
Preliminary Design	1 October 2004 - 31 May 2005
Detailed Design	1 June 2005 - 31 May 2007
Gazettal	1 August 2005
Approval of EIA Study Report	28 February 2006
Project Agreement	31 August 2006
Commencement of Construction	1 September 2006
Completion of all Structures	31 October 2009
Completion of Testing and Trial Running. Ready to open to the Public.	29 August 2010

2.1.2 An Environmental Impact Assessment (EIA) will be undertaken by environmental consultants, providing interactive environmental inputs to the preliminary design team for WIL/SIL. Environmental monitoring of the project during implementation will be conducted by MTRCL.

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2.2 Interaction with Other Projects

- 2.2.1 No significant interfacing with other projects have been identified, other than possibly with the KCRC SCL project at Admiralty. The status, timing and details of KCRC's intended works in the Admiralty area are not currently available.

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3. POSSIBLE IMPACTS ON THE ENVIRONMENT

3.1 Outline of Processes Involved

Construction

3.1.1 The envisaged methods of construction for various stations and alignment sections include:

- Construction of tunnels and stations by open shield and compressed air tunnelling, drill-and-blast, cut-and-cover and New Austrian Tunnelling Method (NATM).
- Rock cavern for underground station construction by drill-and-blast.
- Construction of the depot and above ground stations/viaduct by reinforced concrete (R.C.) construction.
- Construction of the elevated section of the railway with a superstructure comprising prestressed precast concrete units on reinforced in-situ concrete substructures.
- Construction of the bridge across the Aberdeen Channel with reinforced concrete substructure and precast concrete superstructure.

Railway and Depot Operation

3.1.2 The WIL/SIL will be a medium-capacity railway system. The WIL/SIL trains will run between the terminus stations on a 19-hour operating day, 365-day year basis.

3.1.3 The WIL/SIL depot is proposed to be on the site of the existing Wong Chuk Hang Estate. Possible facilities at the depot include train stabling and maintenance, comprising a maintenance workshop (including heavy maintenance track with inspection pits), maintenance shops (e.g. pneumatic, brakes, tyres, air-conditioning, doors, etc), wash plant, cranes, train lifting facility and stores.

3.2 Potential Environmental Impacts

3.2.1 Potential environmental impacts associated with the construction and operation of the project have been identified based on the preliminary project design information, as presented below.

Construction Phase

Air Quality

- Dust from construction activities e.g. excavation and filling, and gaseous emissions from construction plant and vehicles.

Noise

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- Airborne construction noise generated from construction of cut and cover sections, above ground structures, tunnel portals and ventilation shafts, with key impacts expected at Aberdeen and South Horizons Stations; and
 - Groundborne construction noise from tunnelling works which will be limited.
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Water Quality

- Site runoff and drainage from land-based construction activities;
- Effluent from general construction activities, tunnelling and underground works;
- Sewage effluents from the construction workforce; and
- Potential impacts on marine water quality and hydrodynamic conditions in the Aberdeen Channel and Wong Chuk Hang Nullah due to construction of the bridge and viaduct piers.

Waste Management

- Environmental impacts associated with construction waste, including construction and demolition (C&D) materials; excavated material from tunnelling works; chemical wastes; and general refuse. Disposal of filling material from the project in the order of 1.7M m³ is envisaged.

Ecology

- Potential direct impacts to areas of recognized conservation interest (e.g. Nam Fung Road Woodland Site of Special Scientific Interest (SSSI) and Aberdeen Country Park);
- Direct impacts to natural habitats, flora and fauna, such as, woodland and natural stream habitats; and
- Indirect disturbance to habitats and associated wildlife due to construction activities.

Landscape and Visual

- Potential impacts to Champion Trees, Green Belt and Country Park areas; and
- Visual impact from above ground construction works, particularly at Cyberport, Wong Chuk Hang and Ocean Park stations, the bridge crossing Aberdeen Channel, the Wong Chuk Hang Depot, and the viaducts from Aberdeen and Lei Tung to the portal north of Ocean Park station.

Cultural Heritage

- Potential disturbance to Declared Monuments, archaeological sites and historic buildings.

Land Contamination

- Potential land contamination issues in relation to possible resumption of an existing petrol station, in operation for more than 30 years, at the junction of Aberdeen Main Road and Tung Sing Road.

Potentially Hazardous Installation (PHI) Hazards

- Potential hazards from an existing PHI, the Liquefied Petroleum Gas (LPG) Transit Depot/Bulk Domestic Supply at Lee Nam Road in Ap Lei Chau. This
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is approximately 450 m from the construction of the South Horizons section of railway and it is within the 500 m PHI consultation zone; and

- Potential hazards from an explosives magazine needed for the construction of tunnels by drill-and-blast method.
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Operation Phase

Air Quality

- No impacts are expected from the emission free electrically powered rail system and the normal exhaust air from railway operations would be insignificant.

Noise

- Air- and structure-borne railway noise from viaducts and above ground stations;
- Operational groundborne railway noise impacts are not expected due to the type of rolling stock to be adopted; and
- Operational noise from fixed plant e.g. ventilation shafts, tunnel ventilation fans, plant at the depot.

Water Quality

- Runoff from above ground structures and tunnel drainage;
- Wastewater discharge e.g. depot operations, tunnel operations and air-conditioning systems; and
- Potential impact on hydrodynamic conditions in the Aberdeen Channel and Wong Chuk Hang Nullah due to presence of bridge and viaduct piers.

Waste Management

- Waste including general refuse, industrial waste and chemical waste will be generated.

Ecology

- Potential disturbance from train operations, if there are significant noise sensitive ecological resources present.

Landscape and Visual

- Potential loss of landscape resources e.g. mature trees, natural hill slopes and parks; and
- Visual impact of above ground structures such as the bridge, viaducts, ventilation shafts, stations and the depot.

Cultural Heritage

- Indirect vibration impact to historic buildings and Declared Monuments are not expected given the type of rolling stock adopted; and
- Potential visual impact from viaducts to historic buildings e.g. in Wong Chuk Hang San Wai.

Land Contamination

- No land contamination issues expected.

Potentially Hazardous Installation (PHI) Hazards

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- Potential hazards during operation of the railway from the LPG Transit Depot/Bulk Domestic Supply PHI in Ap Lei Chau.

4. MAJOR ELEMENTS OF THE SURROUNDING ENVIRONMENT

4.1 The major existing and planned sensitive receivers and parts of the natural environment that might be affected by the proposed project are highlighted in **Table 4.1**.

Table 4.1 Major Existing and Planned Sensitive Receivers

Section	Type of Sensitive Uses	Sensitive Receivers/Sensitive Parts of Natural Environment
Sheung Wan to Sai Ying Pun Station	Residential Development	Residences at Tung Loi Lane Wing Lok Street, Bonham Strand, Queen Street, Ko Shing Street and Queen's Road West, and Sheung Wan Civic Centre.
	Health Care Facilities	Sai Ying Pun Jockey Club Polyclinic, Tsang Yuk Hospital and the Prince Philip Dental Hospital.
Sai Ying Pun to University Station	Residential Development	Residences at Second Street, Third Street, High Street, Centre Street, Bonham Road, Pok Fu Lam Road, Po Tuck Street and Hill Road.
	Health Care Facilities	Eastern Street Methadone Clinic and Hong Kong Government David Trench Rehabilitation Centre.
	Educational Institutions	Schools at Bonham Road and Pok Fu Lam Road.
	Places of Public Worship	Kau Yan Church.
	Places of High Visual Value	King George V Memorial Park and Champion Trees next to Starr Hall.
	Sites of Cultural Heritage	Crime Wing Hong Kong Island Regional Headquarter, Eastern Street Methadone Clinic, Sai Ying Pun Community Complex, Kau Yan Church, King's College, Fung Ping Shan Building, St. Louis School, Hung Hing Ying Building, Main Building of the University of Hong Kong and Water Services Department (WSD) Senior Staff Quarter & Workmen's Quarter.
University to Kennedy Town Station	Residential Development	Residences at Pok Fu Lam Road, Holland Street, Sands Street and Pokfield Road.
	Educational Institutions	Schools at Hill Road and Pokfield Road.

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Section	Type of Sensitive Uses	Sensitive Receivers/Sensitive Parts of Natural Environment
	Places of Public Worship	Lo Pan Temple.
	Places of High Visual Value	Belcher Bay Park.
	Sites of Cultural Heritage	Lo Pan Temple.
Kennedy Town to Queen Mary Hospital Station	Residential Development	Residences at Smithfield Road, Forbes Street, Candogan Street and Mount Davis Road.
	Places of High Visual Value	Champion Tree near Wei Lun Hall.
Queen Mary Hospital to Cyberport Station	Residential Development	Student hostels at Sassoon Road, residences at Northcote Close and hotel development at Cyberport.
	Educational Institutions	Planned school at Information Crescent.
	Health Care Facilities	Queen Mary Hospital.
	Ecologically Significant Areas	Natural stream, and secondary woodland on hillside west of Kong Sin Wan Tsuen (area zoned as Green Belt).
	Places of High Visual Value	Green Belt at Kong Sin Wan.
Cyberport to Wah Fu Station	Residential Development	Residences at Cyberport Road and Wah Fu Estate.
	Educational Institutions	Schools at Wah Fu Estate.
	Ecologically Significant Areas	Woodland/shrubland in Green Belt between Victoria Road and Pok Fu Lam Road.
	Places of High Visual Value	Green Belt between Victoria Road and Pok Fu Lam Road.
Wah Fu to Tin Wan Station	Residential Development	Residences at Wah Kwai Estate and Wah Fu Road.
Tin Wan to Aberdeen Station	Residential Development	Residences at Tin Wan Street and Aberdeen Main Road, Yue Fai Road and Yue Kwong Road.

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Section	Type of Sensitive Uses	Sensitive Receivers/Sensitive Parts of Natural Environment
Station	Educational Institutions	Schools at Aberdeen Main Road and Aberdeen Reservoir Road.
	Health Care Facilities	Homes for the aged at Tin Wan Street.
	Places of Public Worship	St. Peter Church, Tin Hau Temple and Aberdeen Baptist Church.
	Site of Cultural Heritage	Tin Hau Temple.

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Section	Type of Sensitive Uses	Sensitive Receivers/Sensitive Parts of Natural Environment
Aberdeen to Wong Chuk Hang Station	Residential Development	Residences at Aberdeen Main Road, Yue Fai Road, Yue Kwong Road and Aberdeen Praya Road.
	Health Care Facilities	Jockey Club Polyclinic, Aberdeen, Tung Wah Group of Hospitals Jockey Club Rehabilitation Complex, and homes for the aged at Welfare Road.
	Places of Public Worship	Tai Wong Ye Temple.
	Water Bodies	Aberdeen Lower Reservoir Stream, Aberdeen Channel, Aberdeen South Typhoon Shelter, Aberdeen West Typhoon Shelter, Aberdeen Marina Club and Wong Chuk Hang Nullah.
	Ecologically Significant Areas	Green Belt next to Aberdeen Nullah, and Aberdeen Lower Reservoir Stream.
	Places of High Visual Value	Green Belt next to Aberdeen, and Champion Tree near Aberdeen Technical School.
	Sites of Cultural Heritage	Aberdeen Technical School.
South Horizons to Lei Tung Station	Residential Development	Residences at South Horizons, Ap Lei Chau Estate, Ap Lei Chau Bridge Road and Lei Tung Estate.
	Educational Institutions	Schools at Ap Lei Chau Bridge Road.
Lei Tung to Wong Chuk Hang Station	Residential Development	Residences at Lei Tung Estate, Ap Lei Chau Bridge Road, Yue On Court Road and Ap Lei Chau Drive.
	Educational Institutions	Schools at Lei Tung Estate and Welfare Road.
	Places of Public Worship	Holy Spirit Seminary.
	Ecologically Significant Areas	Green Belt south of Ap Lei Chau Bridge Road.
Wong Chuk Hang Depot	Residential Development	Residences at Wong Chuk Hang Estate, Nam Long Shan Road and Police School Road.

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Section	Type of Sensitive Uses	Sensitive Receivers/Sensitive Parts of Natural Environment
	Educational Institutions	Schools at Nam Long Shan Road and Police School Road.

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Section	Type of Sensitive Uses	Sensitive Receivers/Sensitive Parts of Natural Environment
Wong Chuk Hang to Ocean Park Station	Residential Development	Residences at Wong Chuk Hang Estate.
	Health Care Facilities	Wong Chuk Hang Complex for the Elderly.
	Sites of Cultural Heritage	Potential site of archaeological interest at existing Architectural Services Department (ASD) Property Services Branch District Management Office, Aberdeen.
Ocean Park to Admiralty (Option 7A)	Residential Development	Residences at Wong Chuk Hang San Wai, Shouson Hill Road, Kennedy Road and Queen's Road East.
	Educational Institutions	Schools at Wong Chuk Hang Path and Kennedy Road.
	Places of Public Worship	Hung Shing Temple and Wan Chai Church.
	Areas of Conservation Value	Green Belt, Nam Fung Road Woodland SSSI and Aberdeen Country Park near Aberdeen Tunnel portal.
	Sites of Cultural Heritage	Wong Chuk Hang San Wai, Hung Shing Temple and Flagstaff House (Museum of Tea Ware).
Ocean Park to Happy Valley (Option 7B)	Residential Development	Residences at Wong Nai Chung Gap Road and Stubbs Road.
	Educational Institutions	Schools at Stubbs Road.
	Health Care Facilities	Hong Kong Adventist Hospital.
	Areas of Conservation Value	Green Belt, Nam Fung Road Woodland SSSI and Aberdeen Country Park near Aberdeen Tunnel portal.
Happy Valley to Admiralty (Option 7B)	Residential Development	Residences at Stubbs Road, Kennedy Road and Queen's Road East.
	Educational Institutions	Schools at Queen's Road East and Kennedy Road.
	Health Care Facilities	Home for the aged at Shiu Fai Terrace.

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Section	Type of Sensitive Uses	Sensitive Receivers/Sensitive Parts of Natural Environment
	Sites of Cultural Heritage	Old Wan Chai Post Office, Hung Shing Temple and Pak Tai Temple.

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Section	Type of Sensitive Uses	Sensitive Receivers/Sensitive Parts of Natural Environment
Happy Valley to Wanchai Station (Option 7C)	Residential Development	Residences at Village Road, Queen's Road East and Johnston Road.
	Educational Institutions	Schools at Queen's Road East.
	Health Care Facilities	Hong Kong Sanatorium & Hospital, Tang Shiu Kin Hospital, Tang Chi Ngong Specialist Clinic, MacLehose Dental Centre and Ruitonjee Hospital.
	Places of Public Worship	Hindu Temple and Sikh Temple.
	Site of Cultural Heritage	Sikh Temple.
Wanchai to Admiralty Station (Option 7C)	Residential Development	Residences at Johnston Road and Hennessy Road.

4.2 The following existing land uses might affect the construction and operation of the proposed project:

- Potential PHI hazards from the LPG Transit Depot/Bulk Domestic Supply at Lee Nam Road. Effect during construction and operation of the South Horizons section of the railway which are within the consultation zone; and
- Potential land contamination issues in relation to possible resumption of the petrol station.

5. ENVIRONMENTAL PROTECTION MEASURES TO BE INCORPORATED IN THE DESIGN AND ANY FURTHER ENVIRONMENTAL IMPLICATIONS

To ensure that as many of the environmental issues arising from the construction and operations of the WIL/SIL could be minimized as far as possible, an environmental scoping study has been performed in conjunction with the preliminary design development. Although the final alignment will depend in part on the detailed WIL/SIL design, the choice of a medium capacity rail system, the positioning of the railway lines and the stations underground, the use of rock caverns for station construction, the extensive use of tunnelling and the viaduct positioning and design have already been realized to minimize the most significant environmental impacts.

Broad mitigation measures for the project to minimise potential environmental

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impacts are indicated below, subject to further detailed assessment in the EIA study.

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5.1 Environmental Protection Measures

5.1.1 Construction Phase

Air Quality

- Implement dust suppression measures set out in the Air Pollution Control (Construction Dust) Regulation, such as provision of wheel-washing facilities and watering of exposed ground.

Airborne Noise

- Adopt quiet powered mechanical equipment (PME) and construction methods;
- Adopt noise barriers or enclosures e.g. acoustic doors at tunnel portals to prevent noise outbreak, acoustic enclosures to enclose vertical shafts for tunnelling; and
- Consider indirect technical remedies (ITR).

Groundborne Noise

- Avoid tunnelling works during restricted hours in sensitive areas; and
- Control charge amount and careful scheduling of blasting activities.

Water Quality

- Implement site practices as recommended in ProPECC PN1/94 "Construction Site Drainage";
- Install appropriate drainage facilities to control site runoff;
- Provide adequate treatment facilities to treat process water from construction activities prior to discharge;
- Provide proper toilet facilities; and
- Deploy marine water quality control measures at Aberdeen Channel such as coffer dams, silt curtains and closed grab dredgers.

Waste Management

- Implement waste management practices to minimize waste generation and maximize waste recovery and recycling;
- Sort and segregate waste for reuse and disposal; and
- Dispose waste to landfills only as a last resort.

Ecology

- Avoid and minimise disturbance to conservation areas and any flora/fauna and habitats of conservation interest;
 - Mitigate unavoidable impacts, e.g. transplantation and provision of compensatory habitats; and
 - Minimize indirect construction disturbance, e.g. fence off work areas.
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Landscape and Visual

- Avoid and minimize disturbance to significant landscape resources such as Green Belt and Champion Trees, e.g. minimise work areas;
- Mitigate unavoidable landscape impacts through compensatory planting or transplantation; and
- Use decorative screen hoarding and control night time lighting.

Cultural Heritage

- Avoid and minimize disturbance to Declared Monuments, archaeological sites and historic buildings.

Land Contamination

- Conduct ground investigation for potential land contamination assessment to determine appropriate soil treatment or disposal.

PHI Hazards

- Undertake Risk Assessment for:
 - the explosives magazine needed for tunnel construction; and
 - the railway construction work within the LPG Transit Depot/Bulk Domestic Supply PHI consultation zone.
- Identify any necessary measures to mitigate the hazards.

5.1.2 Operation Phase

Air- and Structure-borne Railway Noise

- Adopt low-noise designs for the viaduct sections, incorporating features such as vehicle skirts, between-track barriers (or centre walkway) or track side parapets/barriers.

Groundborne Railway Noise

- Adopt track-form noise mitigation measures.

Fixed Plant Noise

- Locate and orientate noisy plant away from noise sensitive receivers; and
- Use silencers, mufflers or acoustic shields.

Water Quality

- Install appropriate treatment facilities, e.g. divert surface runoff and cooling water to silt traps and oil interceptors before discharge to existing local stormwater drainage system; and divert wastewater from depot to a dedicated treatment facilities; and
 - Locate railway bridge piers at Aberdeen Channel in line with those for the existing Ap Lei Chau Bridge thus minimising the impact upon the channel flow.
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Waste Management

- Implement waste management practices to minimize waste generation and maximize waste recovery and recycling.

Landscape and Visual

- Landscape planting for the project and reinstatement of planted areas; and
- Aesthetic architectural form, colour and finishes of visible railway structure.

5.2 Possible Severity, Distribution and Duration of Environmental Effects

5.2.1 The construction work is expected to last for just over 3 years from September 2006 to October 2009. The severity and distribution of potential environmental impacts is described in Sections 3 and 4. In particular, noise, marine water quality, landscape/visual, ecology and spoil management are expected to be the key environmental issues during the construction phase. The key issues during operation would be noise impacts eg. from the rolling stock on viaduct sections, and visual impacts from the above ground structures such as bridge and viaducts.

5.2.2 A review of the potential environmental impacts during the construction and operation of the WIL/SIL found that there are no insurmountable impacts. MTRCL is committed to the full integration of environmental issues within the WIL/SIL design and construction, and will ensure adoption of suitable environmental protection measures for full compliance with environmental legislation and standards.

5.3 Further Implications

5.3.1 Between mid 2003 and early 2004 a public consultation exercise was conducted in conjunction with the WIL/SIL Feasibility Study. The public views gathered have been considered and, where appropriate, incorporated into the scheme being developed. Key parties consulted included:

- Southern, Central and Western, and Wan Chai District Councils;
 - Legislative Council Transport Panel;
 - Ocean Park;
 - Cyberport;
 - Professional institutions, e.g. The Hong Kong Institute of Architects and the Hong Kong Institute of Planners; and
 - Statutory bodies, e.g. The Advisory Council on the Environment and the Town Planning Board.
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6. USE OF PREVIOUSLY APPROVED EIA REPORTS

- 6.1 There are no previously approved EIA reports which have been undertaken for this project, but references can be made to recent MTR projects with approved EIA reports, such as those for the Penny's Bay Rail Link and the Cable Car projects.