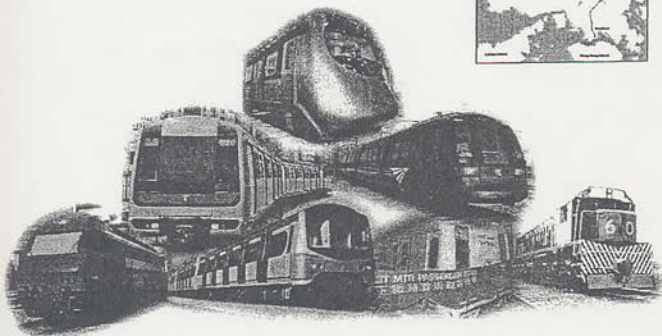
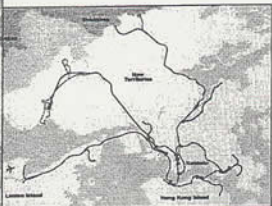
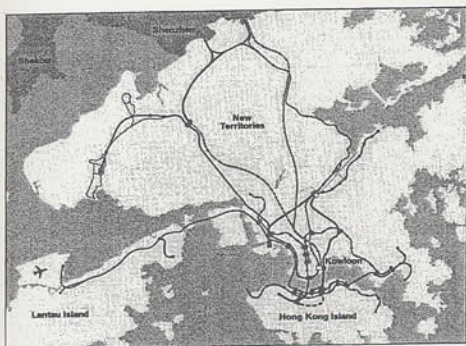


## Introduction



**MVA**  
MVA ASIA LIMITED

**Maunsell**

*in association with*

Brooke Hillier Parker

Deutsche Bank

ERM Limited

FSDI of MOR

GHK (Hong Kong)

Kennedy and Donkin Ltd.

Murray Harrison Ltd.

Parsons Brinckerhoff (Asia) Ltd.

## 1. INTRODUCTION

### 1.1 Background to RDS-2

1.1.1 The first Railway Development Study (RDS-1) was commissioned by the Hong Kong Government in 1991 with the study forming the basis of the Government's Railway Development Strategy announced in December 1994.

1.1.2 The primary aim of RDS-1 was to plan and develop a framework for the implementation of a railway development strategy which would be required for passenger and freight transport in Hong Kong up to the year 2011. A number of study elements were investigated in order to achieve this objective; these included the detailed investigation, definition and reporting of:

- an optimal railway network for Hong Kong;
- a priority list of projects;
- alignment design, sufficient to establish route protection; and
- key issues associated with institutional, funding and implementation aspects of the strategy.

1.1.3 Three projects in particular were identified as being of 'priority' to ensure that Hong Kong's transportation needs would be suitably served within an adequate timeframe. These were:

- the Western Corridor Railway (now known as West Rail);
- the Tseung Kwan O Extension; and
- a rail link connecting Ma On Shan to Tai Wai and an extension of the KCR East Rail from Hung Hom to Tsim Sha Tsui.

1.1.4 These three projects, together with a second Cross Boundary rail link between East Rail and Lok Ma Chau, are currently being implemented and are programmed for completion over the period between 2002 and 2004.

1.1.5 Since the completion of RDS-1, there have been significant changes to the planning context within which the investigations and outcomes of RDS-1 were conducted. The significant changes in terms of the future development of railways are as follows:

- higher population projections resulting from the 1996 Population By-Census;
- an increase in the demand for transportation infrastructure to help achieve the Government's housing targets of 85,000 units a year;
- a shift in the focus to railways as the best means of providing this increase as identified in the Territorial Development Strategy Review (TDSR); and
- an increase in the volume of Cross Boundary rail and road traffic.

- 1.1.6 As a result of these changes, it was considered necessary to plan for the next phase of railway development in Hong Kong. Such a study would require the re-assessment of the priorities identified in RDS-1, the integration of emerging issues and the setting of fresh objectives to ensure the timely implementation and success of future railway development projects. It was against this background that the Second Railway Development Study was initiated by the Railway Development Office of the Highways Department of the Hong Kong SAR Government under Agreement No. CE 87/97.
- 1.1.7 On 30 March 1998, a joint venture between MVA Asia (transportation, institutional and project management) and Maunsell Consultants Asia Limited (engineering and operations) was formally appointed to undertake the Second Railway Development Study (RDS-2). The joint-venture partners led a team of sub-consultants in the undertaking of the Study.
- 1.1.8 The SEA study provided environmental information for the development of the railway development options within the overall study context. It is closely linked to the Network Development Study (NDS). The outputs of the SEA were reported to the client and an Environmental Study Management Group (ESMG) chaired by the Territory Assessment Group (TAG) of the Hong Kong Environmental Protection Department (EPD).

## 1.2 Objectives of RDS-2

- 1.2.1 The overall objective of RDS-2 was to provide Government with the basis to formulate a strategy for development of the railway system to support the future growth and development of Hong Kong. The Study was required to be sufficiently robust to be able to support a range of possible planning, economic and development scenarios that could eventuate over the next 20 years. It was also intended to identify a preferred network that was safe, efficient, financially viable and environmentally acceptable and that was supported by an appropriate institutional framework.
- 1.2.2 Specifically, the Study was intended to recommend railway network expansion plans that would:
- facilitate timely accessibility to strategic growth areas for housing and economic development, and stimulate further developments along railway corridors;
  - relieve bottlenecks in the existing railway system;
  - meet Cross Boundary passenger and freight traffic demands and ensure compatibility and integration with the railway system on the Mainland; and
  - increase the rail share in the overall transport system and thereby reduce the environmental impact of road-based transport.

1.2.3 RDS-2 was focussed solely on segregated railways (ie mainline, suburban and metro services). Whilst this included the possibility of lower capacity, segregated railways in corridors of low demand, the study did not assess the need or feasibility of implementing LRT or trams services which operate in, or are partially segregated from road traffic. As LRT and trams services provide a feeder or distributor role to segregated railways (acting as an alternatives to buses and minibuses), the assessment of their feasibility is therefore more appropriately examined as part of a district or local transport study rather than in the context of a strategic railway study such as RDS-2.

1.2.4 As part of RDS-2, a number of sub-studies were identified to ensure the fulfilment of the Study's objectives. The sub-studies and a brief outline of their content are provided in the paragraphs below.

### **1.3 The Network Development Study**

1.3.1 The Network Development Study (NDS) is concerned with the development of a preferred network for railway network expansion which includes a number of interrelated elements such as transport planning and patronage forecasting, land use and development, railway operations and engineering, as well as economic and financial appraisals. As part of the evaluation of different railway network development options, the NDS included input from the SEA to ensure that, to the fullest extent possible, environmental considerations were fully integrated into the network expansion plans.

### **1.4 Topical Studies**

1.4.1 The Topical Studies involved investigations into a number of specific issues that had critical bearing on the formulation of the preferred network and that allowed more detailed railway planning to be undertaken. The Topical Studies comprised:

- Network Constraints Study - an examination of the existing and anticipated bottlenecks in the existing railway network as a basis from which recommendations were made on necessary relief measures, including by-pass routes, links and any other appropriate means;
- Fourth Rail Harbour Crossing (FHC) - a study of the feasibility of a fourth rail harbour crossing, covering the preferred railway system, route alignment, landing points, timing, interchange arrangement and the broad approach for its implementation;
- Mass Transportation Centre (MTC) - an investigation into the need for, and the feasibility of, establishing an MTC capable of functioning both as an "Inter-City" rail terminal and a major interchange between the KCR, the MTR and non-rail forms of transport; and
- Cross Boundary Passenger and Freight Rail Study - an investigation of the Cross Boundary rail passenger and freight traffic to identify the transport, institutional and other planning considerations for the further development of railway services to cater for existing and future demands.

## **Institutional Studies**

- 1.4.2 The Institutional Study involves investigating and then addressing the administrative, legislative and policy requirements of railway planning, implementation and operation; particularly those elements which had the potential to affect the future railway network expansion. The study included:
- an examination of how the different fare structures of the two existing railway operators impact on demand, including the possibility of fare integration;
  - an investigation of the feasibility of setting unified standards for Hong Kong railways in terms of the design and other technical requirements and the quality of services, the practicality of the sharing of railway infrastructure and the effect of these on the railway network;
  - an investigation of the various funding methods and options for implementation of railway projects that would be appropriate to the situation in Hong Kong; and
  - a review of the existing railway development planning process covering the administrative, legislative, procedural and technical aspects that affect railway project implementation, with a view to recommending measures for fast-tracking the entire railway planning and implementation process.
- 1.4.3 The integration of these three sub-study elements into the pursuit and attainment of the overall Study objectives was managed by MVA/Maunsell and directed by the Railway Development Office of Highways Department (RDO) through the establishment of Steering and Working Groups. The interim findings and reporting of results to other members of the Study Team was also facilitated through regular meetings held by the joint venture partners and at other times as necessary.
- 1.5 Background to the Strategic Environmental Assessment of RDS-2**
- 1.5.1 Environmental Resources Management Hong Kong Ltd (ERM) was commissioned to undertake the SEA of the railway development proposals contained in RDS-2.
- 1.5.2 SEA is a term used to describe the environmental assessment of policies, plans and programmes and it is intended to complement and strengthen the conventional EIA process.
- 1.5.3 At present, SEA is less widely understood and practised than Environmental Impact Assessment (EIA), although SEA studies and applications are being increasingly employed, particularly by international and supra-national organisations. The growth in the application of strategic environmental assessment stems mainly from:
- an increasing recognition of the limitations of the traditional EIA process without an assessment of the policy context within which new development projects take place; and
  - increasing support for measures to promote sustainable development which require the early and transparent integration of environmental assessment techniques into development planning.

- 1.5.4 The documented advantages of SEA are considerable<sup>1</sup> and may be summarised (after Buckley) as follows:
- greater flexibility and opportunity in the consideration of a wider range of alternatives than is possible at the project stage;
  - increased transparency of policy, planning and development decisions;
  - the identification and elimination of environmentally damaging investment alternatives; and
  - the identification of gaps in environmental baseline information.
- 1.5.5 Sectoral SEA of entire industry sectors within a particular country is now used extensively by bilateral and multilateral aid, loan and finance institutions, notably, the World Bank, the Asian Development Bank and the European Commission.
- 1.5.6 SEA is a relatively new tool in its application to Hong Kong and the number and scope of studies to which it has been applied are limited and diverse. Examples of some major SEAs that have been completed are:
- Port and Airport Development Strategy (PADS);
  - Territory Development Strategy Review (TDSR); and
  - The Third Comprehensive Transport Study (CTS-3).
- 1.5.7 Buckley concluded that *"If Governments and electorates are actually concerned that development should be sustainable then SEA, particularly at the policy level, is an urgent and essential step in that direction."*
- 1.5.8 The SEA of RDS-2 is therefore an opportunity for the Hong Kong Government to apply early scrutiny to the historical railway development rationale and specifically, the environmental benefits that new railway developments can offer.
- 1.6 Objectives of the Strategic Environmental Assessment of RDS-2**
- 1.6.1 In order to develop a railway network expansion plan for Hong Kong which gives due regard to environmental concerns and aspirations, it is essential that the SEA forms an integral part of the overall RDS-2 Study.
- 1.6.2 The key objectives of the SEA reflect this key priority:
- to encourage an integrated approach to ensuring that environmental factors are given due consideration in the formulation of the various railway network options and to avoid potential environmental problems;
  - to provide information, including environmental justifications if appropriate, to justify the need for additional rail networks and for adopting the preferred rail network(s);

<sup>1</sup> see for example Buckley, "Strategic Environmental Assessment" and Goodland of the same title, Environmental Methods Review; Retooling Impact Assessment for the New Century, American Environmental Policy Institute edited by Alan Porter and John Fittipaldi.

- to identify and rule out railway development and network options, which are environmentally unacceptable even after the implementation of all practicable mitigation measures;
- to identify the environmentally preferred railway development(s) and network option(s) and provide input to the option selection process; and,
- to evaluate, at a strategic level, the potential environmental impacts of the preferred railway network(s) and development(s) recommended by RDS-2 and identify any environmental mitigation measures and follow-up investigations required.

1.6.3 The integration of environmental factors into the formulation of various railway development options and, through the application of strategic impact assessment, the avoidance of potential environmental constraints and the identification of those options that are environmentally preferred for further investigation are, therefore, key elements of the SEA. Only where impacts to environmental resources are unavoidable, or where considerations deriving from other elements of the Study are considered of overriding importance, would it be appropriate to rely on the traditional approach of conflict identification and mitigation.

1.6.4 Although the main focus of the SEA is related primarily to the work conducted under the NDS, the influence of the SEA has also been evident and at times fundamental in other areas of the Study.

1.6.5 For example, the SEA has inputted into, although had only a small influence on, the selection of options for the MTC and FHC in terms of providing inputs to the Topical Studies. Furthermore, the SEA has provided useful pointers focusing on the assessment and appraisal techniques stipulated for railways and other competing transport modes. These are important elements of the SEA in the context of RDS-2 and are discussed in detail in Annex B of this report.

1.6.6 The SEA Study will also make a contribution to the future development of the new railway projects proposed by RDS-2, through the provision of strategic environmental monitoring and auditing (SEM&A) requirements. These will seek to ensure that the environmental and other issues arising from the Study are adopted and discharged through future project planning and environmental appraisal reporting tasks.

## 1.7 Expansion of the Rail Network

1.7.1 The Chief Executive's 1999 Policy Address made clear the need to expand the existing rail network to both 'relieve existing bottlenecks and to cater for increasing demand.' It also gave a commitment to improving rail services and their interchange arrangements with other transport modes. In addition, the Address gave a strong commitment to improving air quality in Hong Kong.

- 1.7.2 It is clear that the Government is committed to the timely provision of infrastructure, with a particular emphasis on rail, in order to meet Hong Kong's projected transport needs. However, the provision of rail services, and hence the mass movement of passengers by a less polluting means of transportation (i.e. rail rather than road) will also assist in achieving the commitment to improving Hong Kong's air quality. Thus, the findings of the RDS-2 Study, and the SEA component which has considered air quality implications of the rail proposals, come at a key time and will form an important role in meeting the aforementioned policy goals.

## 1.8 Structure of the Report

1.8.1 The structure of the remaining sections of the Final RDS-2 SEA Report is as follows:

- *Section 2* presents a broad overview of the scope of the SEA Study, the review framework provided by Government and interaction with other studies within the RDS-2 Study;
- *Section 3* reviews the current transport planning rationale in Hong Kong, the need for sustainable solutions to transportation and associated environmental issues and includes a comparison of the environmental benefits provided by different forms of transport;
- *Section 4* presents the background assumptions and rationale upon which the development of new railways was undertaken and the steps in the SEA evaluation and assessment that shaped the development process;
- *Section 5* provides details of the network development options that resulted following the initial stage evaluation work that was undertaken for the RDS-2 study, and presents the findings of the SEA Study's environmental evaluation of these options;
- *Section 6* provides details of the recommended rail development options;
- *Section 7* provides details of the key environmental issues associated with the construction and operation of the component schemes proposed within the rail development options;
- *Section 8* presents details of the cumulative environmental impacts that may arise from the implementation of the rail development options;
- *Section 9* presents the details of the future environmental requirements that will need to be further examined and addressed during the subsequent development of the component schemes included within each of the recommended railway development options;
- *Section 10* presents a summary of the conclusions and recommendations of the SEA element of RDS-2; and
- *Section 11* presents a summary of recommended strategic guiding principles that could be applied when considering the future development of rail in Hong Kong in order to reduce the potential environmental impacts to a minimum.

1.8.2 Further information, data and drawings supporting the assessment and findings of the main study can be found within the Volumes 1 and 2 (the main text, figures and appendices) of the RDS-2 Final Report.



1.8.3 Given the importance placed in the Study on institutional issues and the identification of these as being fundamental to the successful development of the new railway development options and in the achievement of at least part of the environmental benefits identified in the Study, the Key Issues Papers produced by the SEA have been updated and reproduced in their entirety as Annexes to this Report. The Annexes are as follows:

- *Annex A* - Economic Appraisal of the Environmental Costs and Benefits of New Railways
- *Annex B* - Comparative Assessment of Road versus Rail
- *Annex C* - Environmental Performance Indicators
- *Annex D* - Baseline Information Data