Hong Kong's Light Rail Plans

by Doug Tomlinson
Far East Editor

Groundbreaking took place last November 18 on what promises to be a significant addition to Hong Kong's transportation network. Provisionally scheduled to be completed on "8/8/88" (August 8, 1988), since eight is a particularly auspicious number in Chinese society, Hong Kong's Light Rail Transit (LRT) Project, in the western New Territories, will be the second modern LRT system in the Far East. The first was Manila's Metrorail, which became fully operational last year.

Budgeted at HK$1 billion (US$128 million), the first phase of the project will comprise seven routes running on 23 km (14.3 mi) of double track with 41 stops in and between the new towns of Tuen Mun and Yuen Long along Castle Peak Road. The current populations of the two towns are 250 000 and 65 000, respectively, with another 180 000 in the surrounding area.

Phase 1 makes up about two-thirds of the full system as presently planned. The full network will have 16 routes and 66 stops along 34 km (21.1 mi) of double track, and also will include the new town of Tin Shui Wan. At completion, the system will be capable of moving 70 000 passengers hourly, a very heavy light rail capacity.

The new LRT will not be Hong Kong's first experience with light rail. There is already a short tram network, operated by Hongkong Tramways and consisting of 162 doubledeck trams running on 13 km (8.1 mi) of double track on streets on the northern side of Hong Kong Island. Ridership in 1985 came to 120.8 million passenger journeys.

The New Territories LRT, however, will be modern light rail, operating largely on dedicated track with the latest in modern light rail vehicles (LRVs). The new system will join two other modern heavy rail systems already in operation. One, the 36-km (22.4-mi) metro, with three lines, is operated by the Mass Transit Railway Corp. (MTRC), while the other, the 34-km (21.1-mi) Kowloon-Canton Railway (KCR), provides commuter service between downtown Kowloon and the central New Territories, and international passenger and freight services with China. The KCR also operates through passenger trains to Guangzhou (Canton).

The KCR, a model of what electrification and modernization can do to a sleepy rural rail line (MT September 1984), has taken on the task of putting in the new LRT. How does a heavy rail operator like the KCR Corporation end up building a light rail system that will be separated physically from its present line by at least 20 km (12.4 mi)?

A survey of the history of this project will provide some idea of how planning works in Hong Kong.

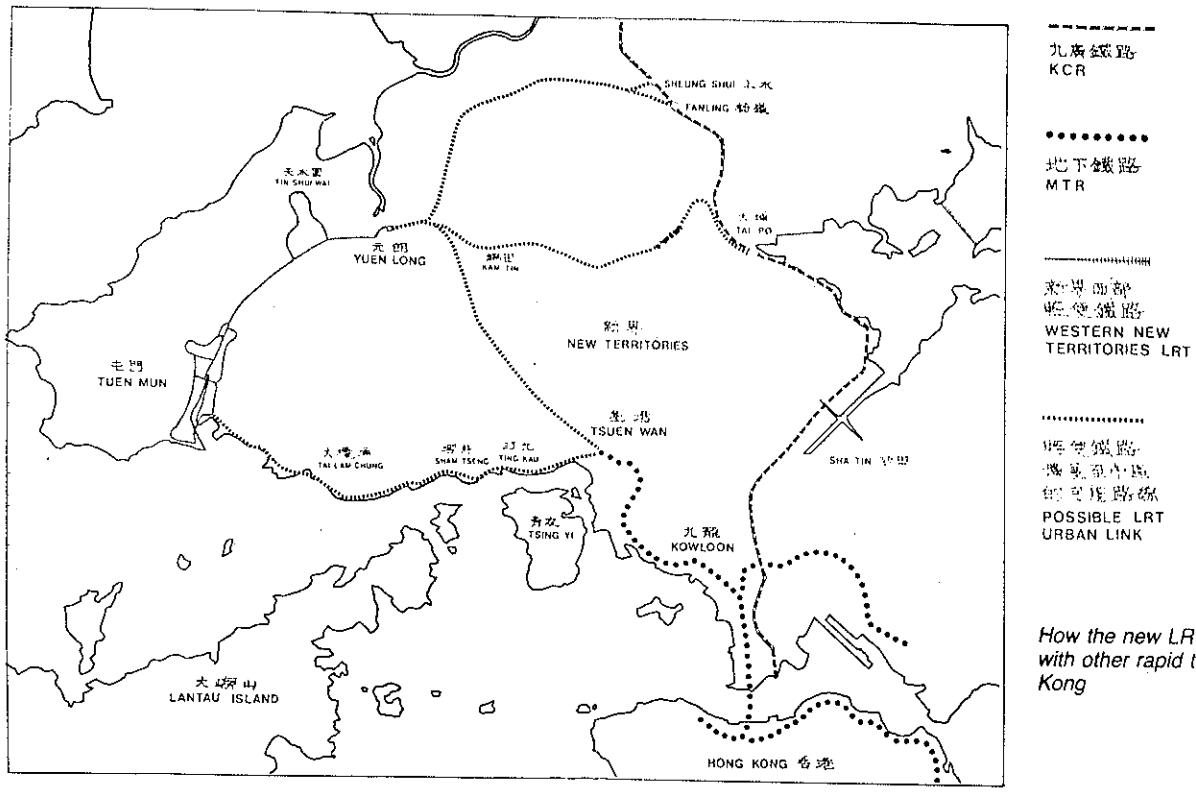
In 1972, Hongkong Tramways proposed building a circular LRT route in Tuen Mun. Its overture was premature, since the outline plan for the new town had not yet been determined. By 1974, however, the town plan was taking shape, and even included an "exclusive public transport right of way."

A transport study in 1977 and 1978 recommended a LRT system over conventional buses, despite the more expensive installation cost, because it would prove cheaper to the community than buses in the long run, and because it would be preferable environmentally and in terms of safety.

The Hong Kong Government accepted the consultant's recommendations and in 1979 began negotiations with the Hong Kong & Kowloon Wharf & Godown Co., the owner of Hongkong Tramways, which had expressed an interest in building and running the system. Negotiations became protracted, particularly over the issue of associated property development, and ended in early 1983 when the Wharf Co. withdrew, just as the Hong Kong property market declined.

The new town in Tuen Mun, however, had continued to develop and grow, and the physical layout of the LRT system had been decided and was already taking shape on the ground. During its negotiations with the Government, the Wharf Co. had invited prequalification tenders from six consortia comprising financial advisors, suppliers and contractors.

The consortia, all of which believed the project would be viable as a transport project alone, made informal presentations to the Secretary of Transport during 1983. The Government, in looking for a suitable owner/operator, asked the



How the new LRT will connect with other rapid transit in Hong Kong

KCRC, which had just completed its successful electrification and modernization project in November, to examine the LRT project. The Corporation, in turn, appointed Scott, Wilson, Kirkpatrick & Partners as its evaluation consultant. In July 1984, after eight months of study, the KCRC decided to go ahead.

To help it prepare detailed system standards and specifications for the project and to advise on tendering and implementation, the Corporation the next month again appointed Scott, Wilson, this time as technical consultant, with Switzerland's Electrowatt Engineering Services as electrical and mechanical (E&M) consultant. Citicorp Capital Markets Group was also selected as financial advisor, to assist in preparing a detailed budget, to assess funding requirements and sources and to advise on the most economical and efficient implementation of the project. The consultants completed their pretendering work by the end of 1984.

In January 1985, the KCRC invited tenders for Phase 1 from five prequalified consortia: ACEC of Belgium, GEC/Gammon of the U.K., Leighton/MTA of Australia, Mitsubishi of Japan and the Sino/Canadian consortium of China Road and Bridge Engineering/UTDC.

The tender, on a turnkey basis, was to cover the supply and commissioning of 70 LRVs, electrical plant and power supply systems, communications and control systems, ticketing/fare collection system, workshop equipment, permanent way works, civil structures including stops, terminuses, depot, workshop, substations and rectifier stations, and the training of KCRC staff and assistance in the commissioning and early stage of operating the system.

The bids were submitted in late April. In May, the Corporation announced that "detailed discussions and further in-depth evaluation would be held over the following two months with Belgium's ACEC and Britain's GEC/Gammon, leading many to believe that the two consortia had been shortlisted.

When the contract eventually was awarded to the Australian Leighton/MTA consortium last July 15, there was some surprise at what appeared to be a "dark horse" award. But as Peter Quick, KCRC's managing director, put it at the time, the Australians had provided "the best technical solutions at the cheapest cost."

In a recent interview with MT, Joe Wade, who was appointed light rail director in November 1984, went into the events behind the awarding of the contract to the Australians. "The KCRC Board decided to concentrate on the GEC/Gammon and ACEC consortia, but continued discussions with the other three. In these discussions, the Australian consortium clarified and elaborated on their offer on all fronts," he said—enough, obviously, to come from behind and win the contract.

Wade added that the only qualms the Corporation had about the winners were that they lacked "international railway expertise" and did not have as much "international experience" as other bidders.

Leighton and MTA need an introduction. Leighton Contractors (Asia) Ltd. is the Hong Kong subsidiary of a major Australian construction company. It has had extensive civil engineering experience in Hong Kong, and recently built the just-opened permanent Tai Wai Station for KCR. It was also involved in three different construction contracts on the MTR's Island Line, which went into service in May last year.

MTA (Metropolitan Transit Authority of Victoria) is the operator of Melbourne's extensive transit network, which includes, in addition to buses, 680 trams operating on 327 route/km (203 route/mi), with over 100 million passenger journeys on the trams alone.

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Artist rendering of Tuen Mun vehicle

hong kong

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As the main contractor, Leighton/MTA has overall responsibility for designing and constructing the turnkey project, but has subcontracted extensively for equipment and even construction.

The 70 LRVs, although being supplied by Comeng, the Australian rolling stock maker, will have largely European components. AEG propulsion equipment will power the cars, which will be controlled by Siemens technology. Duewag is supplying the bogies, while Knorr-Bremse will provide the gearboxes and transmissions. Each LRV will be 20 m (65.6 ft) long and 2.65 m (8.7 ft) wide, with room for 190 passengers, about 30% of them seated. The cars will be fully air-conditioned and have three sets of double doors along one side for easy entry and exit. The LRVs can operate singly or coupled together, and while they can travel at up to 80 kph (50 mph), average speeds will range from 22–27 kmh (14–17 mph).

The other E&M subcontractors, except for ticketing and fare collection equipment to be supplied by Autelca of Switzerland, make for an all-British effort. They include Balfour Beatty for all overline equipment; Cable & Wireless Systems for the communications and control systems, with Plessey the signalling supplier; Henry Boot for track laying (Boot has already supplied both the KCR and the MTR with all their track, and is also supplying Singapore's mass rapid transit project, now under construction); Hawker Siddeley Power Engineering for the power supply, heavy cabling and substations; and the Vickers PLC Design & Project Division for workshop equipment.

The main consultant for the project is Freeman Fox (Far East) and Belgium's Transurb, with Scott, Wilson as the civil engineering consultant. By choosing Transurb, the Corporation gets that consultant's experience with Manila's Metrorail LRT, among other light rail projects, and as part of the unsuccessful ACEC bid. Freeman Fox was involved in the unsuccessful GEC/Gammon bid, and has conducted studies and engineering consultancy for the MTR.

In the interview, Wade explained the rationale behind choosing different consultants for different aspects at different stages of the project. The choice of Transurb "reflects the importance attached to the railway works, rather than to the civil works," he said. Pointing out that the ratio of civil works to E&M in the LRT project is 25:75, compared to 75:25 for the heavy rail MTR, he stressed that a bias toward E&M was necessary. Evaluation (originally conducted by Scott, Wilson) and implementation, he noted, "reflect different situations," and thus require different consulting expertise.

Even before groundbreaking took place last November, the Government of Hong Kong was hard at work on the project. Under its agreement with the KCRC, the Government is responsible for acquiring and forming all land required for the LRT including all associated engineering works such as footbridges, road works and diversions, new structures to carry the LRT, relocation of utilities, etc.—all at a cost of HK$500 million (US$64 million) through 1988. This includes the cost of forming track beds and reserves in Tuen Mun, completed in conjunction with the development of the new town.

It is significant that, typical of Hong Kong transportation projects, there are *no* direct guarantees or financial input from the Government for the LRT. The KCRC will take full responsibility for its financial commitments.

At the moment, the depot is under construction on reclaimed land. Much of the construction is being done by Leighton's Australian parent company. The LRT Division has set up shop in downtown Tuen Mun, with some 45 personnel in house to date. This number will grow to 600 in mid 1988 when Phase 1 is completed, and to 1 000 when fully operational some years later.

(continued on page 67)

For more information on the financing of Tuen Mun, contact Erik H.S. Cheng, finance manager, KCRC—Light Rail Division, 13 Tat Yan Square, Tuen Mun, N.T., Hong Kong. Telex: 51618 LRT HX

hong kong

(continued from page 10)

A major concern throughout the concept and planning process has been access to Kowloon and other parts of "downtown" Hong Kong. There is a 17-km (10.6 mi) gap between Tuen Mun and Tsuen Wan, the northwestern terminus of the MTR. Commuters currently ride Kowloon Motor Bus (KMB) doubledeckers along this route for HK$2.10 (US$0.27), or take a 35-minute hoverferry ride for HK$9 (US$1.15) from Tuen Mun to Central on Hong Kong Island.

In response to this concern, the KCRC initiated studies in prospects of extending the LRT.

It is intended that the study will narrow the options within four months, and recommend a final choice by the end of this year. The KCRC is to decide whether to proceed with what would be its third major rail project by August of next year.

Meanwhile, the Corporation has already decided to develop the property over its southern terminus at Tuen Mun Pier Head, where a new hoverferry pier is being built. Six 32-story towers, comprising 1 450 apartments, will be built over the next three years at a cost of HK$400 million (US$51.2 million) by the developer—at no cost to the KCRC. The location, on top of the terminus and in front of the hoverferry, should not lack for tenants.

Wade suggests LRT development in the New Territories should be looked at, not in terms of 1997 and Hong Kong's reversion to Chinese sovereignty, but 15 years hence. By then, the adjoining Shenzhen Economic Zone (SEZ), already partially separated administratively from Guangdong Province, may well be fully linked economically and politically with Hong Kong.

SEZ authorities are already thinking of rail links in the Zone branching out from their section of the Guangzhou-Kowloon line. An obvious implication is that there will be north-south links between the New Territories and the SEZ, in addition to the east-west links to either or both the MTR and the KCR. And Tuen Mun-Shenzhen may offer a second north-south corridor to supplement the traditional one north from Kowloon to the border.

All these possibilities are in the future, but they say a great deal about "8/8/88" in Hong Kong, China, 1997 and beyond.□