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Tokyo Metro prepares for privatisation

Construction of Line 13 in 2007 will complete the publicly-funded metro network in Japan's capital, paving the way for shares in the restructured operating company to be floated on the stock market. Chris Jackson discussed developments with Tokyo Metro's Director, Corporate Planning & Administration, Toshikazu Saito and Director of International Affairs Hidemi Someya

APRIL 1 2004 was a milestone in the history of Tokyo's metropolitan railways. The former Teito Rapid Transit Authority was replaced by a new company, Tokyo Metro Co Ltd, as the first step in the process of returning the metro network to private ownership.

Tokyo Metro is structured as a 'special corporation', with a registered share capital of ¥58·1bn, but at present all the shares are still owned by public-sector bodies. The company is owned 53·4% by the Japanese government and 46·6% by Tokyo Metropolitan Government – the same proportions as their respective stakes in TRTA.

The company is the larger of the two metro operators in the Japanese capital, running eight lines compared to Toei's four. Tokyo Metro runs a network of 183·2 km and handles around 75% of all metro passengers in the capital.

Over the next few years, the government and TMG expect to transfer ownership of Tokyo Metro to the private sector by floating tranches of shares on the Tokyo Stock Exchange, in a similar process to that adopted for JR East, JR West and JR Central. This privatisation will, in fact, complete a circle in terms of ownership, as the TRTA network has its origins in the private sector.

The privatisation strategy was drawn up by the Doko Committee, formed in 1986 to consider the long-term development of the TRTA network, and enshrined in legislation passed in 2002.

Under the old structure, TRTA had to comply with the 'law on rapid transport' which meant that it could only invest in projects approved by government, and carried heavy responsibilities reflecting the high levels of state funding.

Toshikazu Saito (left) is Tokyo Metro's Director, Corporate Planning & Administration. Hidemi Someya (right) is Director of International Affairs

The new regulations and changed status give Tokyo Metro the freedom to manage its own business and powers to develop related activities where this is considered appropriate. In addition, the private corporation structure is more focused on the needs of customers and on the operation of the network – measured by factors such as safety, reliability and comfort.

In return for this freedom to manage, the government expects to see the value of its capital increase as the price of Tokyo Metro shares starts to rise in line with improved management performance. Both the national government and Tokyo Metropolitan Government will be able to realise a capital gain by selling their stakes at a good price, when the market conditions are right.

The timing of the sale is a matter for the owners, but will depend on stable management performance at Tokyo Metro and prevailing stock market conditions. However, the board does not expect to see any shares sold before the opening of Line 13 in 2007. This is an expensive project, and the level of patronage after it opens will have a major impact on the metro's profitability and commercial results.

Steady growth continues

The capital's oldest metro line, the 2·2 km section of the Ginza Line between Asakusa and Ueno, was opened

TOP: *Carrying a commemorative headboard to mark the first anniversary of Tokyo Metro, this Series 06 trainset on the Chiyoda Line is typical of the more recent generations of stock operated by the company.*

LEFT: *Series 08 cars are used on the Hanzomon Line*

by the private-sector Tokyo Underground Railway in 1927. The rate of construction was slow, and a second company, the Tokyo Rapid Railway, was formed before the whole 14·3 km line could be completed in 1939.

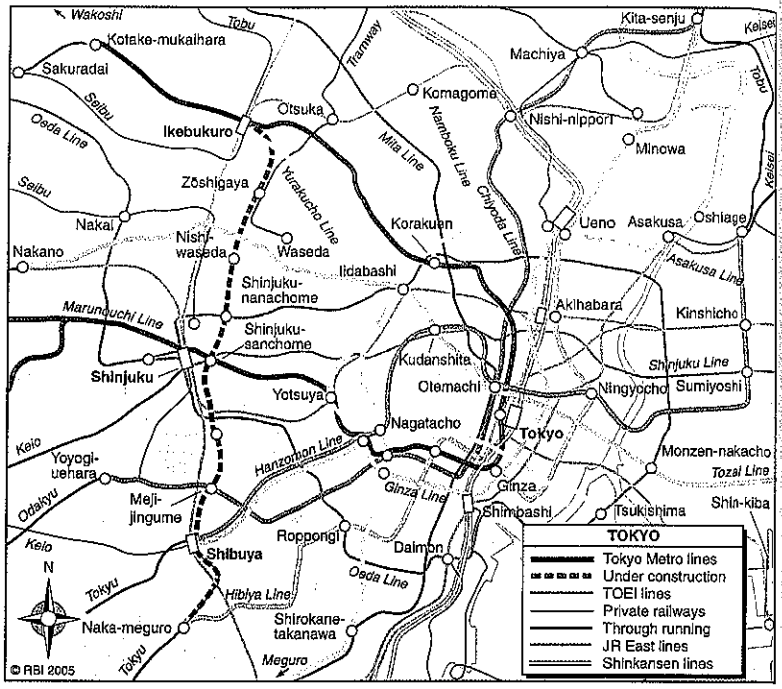
However, the cost of building new lines proved too great for the private sector to carry, which is why the network ended up in public ownership. In 1941 the city government decided that it would have to take the lead. The two companies were taken over and merged to form TRTA, which was given a remit to build and operate the growing metro network.

Over the next 63 years, TRTA completed a further seven lines totalling 168 km, funded by a mix of grants and loans from the national government. Of the total ¥1 883bn invested in new line construction between 1950 and 2002, 43·2% came in government funds and 12% in interest-free loans. Another 33·7% was raised from the private sector, including ¥535·9bn in public subscriptions to transport bonds.

The expansion process concluded with the opening of the last section of the Hanzomon Line in 2003, and today the network's 2 515 vehicles handle an average of 5·7 million passengers per day.

The newest route in the Tokyo Metro network is the Namboku Line, which was completed through to Meguro in September 2000. Fitted with platform screen doors throughout, this line is worked by Series 9000 trainsets equipped for Automatic Train Operation, although an attendant is still carried on each train. All the other lines are fitted with ATC, and cab signalling is provided on all lines except the Tozai Line.

The government now believes that only one more route remains to be completed before the network reaches a natural maturity. Once the construction phase ends, there will be no further need for capital grants. The operating business should be able to cover its day-to-day running costs from revenue, making it fit for transfer to private ownership.



Line 13 takes shape

Expected to cost around ¥251bn, the 8·9 km Line 13 due to open in 2007 will provide a north-south link between Ikebukuro and Shibuya. It is primarily intended to relieve the western side of JR East's Yamanote Loop, which today is the busiest railway in the capital.

Running under the busy thoroughfare of Meiji-Dori, Line 13 will also help to relieve traffic congestion on the roads around Shinjuku. In the longer term, through-running agreements with the private suburban railways at both ends of the line are expected to drive the development of cross-regional commuting between Saitama prefecture and Yokohama.

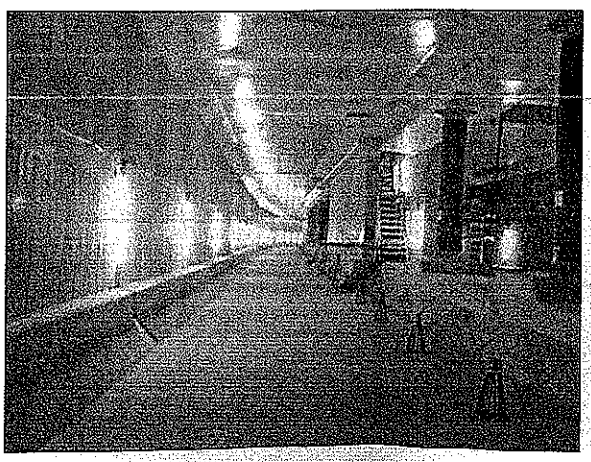
The basic concept for Line 13 was agreed by the Transportation Policy Council in 1985 and proposals for through running were endorsed in 2000. Responsibility for project planning, development and construction management of Line 13 was initially awarded to the TRTA Construction Bureau, although this was abolished and replaced by Tokyo Metro's Construction Department as part of the restructuring.

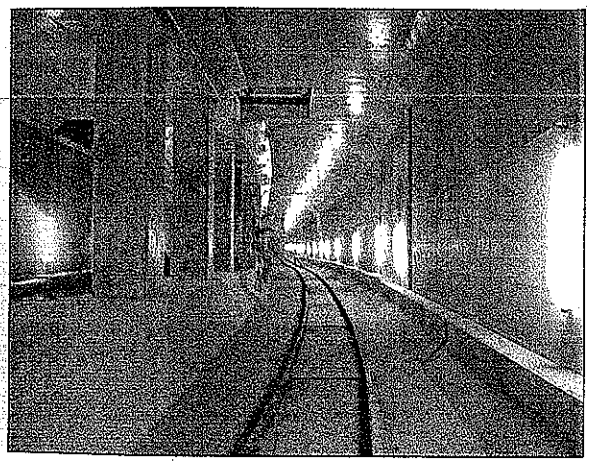
Five of the eight new stations are being built using cut-and-cover, with 15 m wide station boxes. At Zoshigaya and Nishi-Waseda, twin-bore station caverns are being dug using shield tunnelling methods, which are also being used for the running tunnels. At Shinjuku-nanachome there will be separate island platforms for each direction, located one above the other. At this point the lower running tunnel will be 25 m below ground level. The Shibuya station box is 36 m wide to accommodate four platform tracks on the lower level, 21 m below ground.

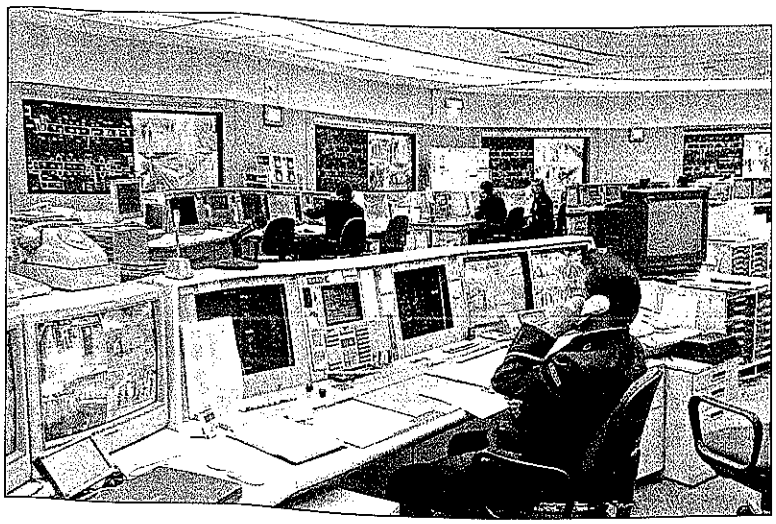
Through-running strategy

Tokyo Metro has extensive through-running arrangements with JR East and various private railways (Table 1), except for the Ginza and Marunouchi lines where the gauge and third-rail power supply are incompatible. Through running will also play a fundamental part in the Line 13 operating strategy.

Civil engineering work is well advanced on the 8·9 km first phase of Line 13 between Ikebukuro and Shibuya, which is expected to open in 2007







Tokyo Metro's integrated control centre brings together the teams responsible for train operations, passenger movements, power control, rolling stock and engineering facilities

Several railways feed into Ikebukuro, from where passengers transfer to the Yamanote Loop, or to the Marunouchi and Yurakucho lines. There are existing through services onto the metro's Yurakucho Line from Tobu Railway's Tojo Line at Wakoshi and from Seibu's Yurakucho Line at Kotake-mukaihara.

Between Kotake-mukaihara and Ikebukuro the metro's capacity has been doubled by the construction of two express tracks, the so-called Yurakucho New Line. These tracks will be transferred to Line 13 from 2007, after which the Tobu trains will run through to Shibuya and the Seibu trains will continue to serve the Yurakucho Line.

At the southern end of Line 13, a connection from Shibuya to meet Tokyu Railway's Toyoko Line at Daikanyama is due to be completed in 2012. Trains will continue over the Toyoko Line to Yokohama, where they will run through onto the recently-opened Minato-Mirai 21 metro line.

A special committee has been formed to draw up the specifications for the through services by the five railways involved – Tokyo Metro, Tokyu, Tobu, Seibu, and Minato-Mirai 21. A co-operation agreement has already been signed covering the basic specifications such as the 1 067 mm track gauge, tunnel profile, kinematic envelope and signalling system. To a large extent these specifications mirror those for the through services on the Yurakucho Line, because Line 13 will inherit some of the existing through services.

There are some difference between the trains used on the other routes, but all will meet the Line 13 tunnel standards. The biggest technical issues reflect the five different signalling systems now in use, which means that the through-running trainsets will have to be fitted with multiple sets of on-board equipment. Some other upgrading work will be needed on the Tokyu Toyoko Line, and this is due to be completed by the time that the Shibuya link opens in 2012.

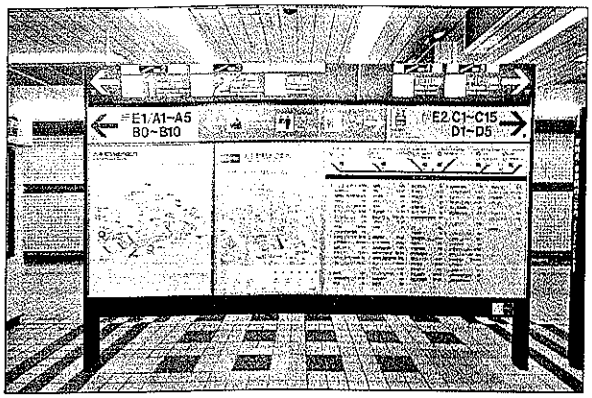
The through service committee is still discussing the details of the Line 13 operating plan, which have not yet been finalised. The intention is to equalise the train mileage operated by each partner. A more intensive service is expected to operate over the central section to augment the through trains, but it has not yet been decided where the extra services will start and finish at each end.

Tokyo Metro is planning to buy new rolling stock for its share of the operation, and unofficial discussions have started on the topic of design. At present the metro, Tobu and Seibu have standardised on 10-car formations, whilst Tokyu uses eight-car trains. The stations on Line 13 are all being built to accommodate 10-car formations,

Table I. Tokyo's metro network in figures

Line	Name	Route	Length km	Gauge mm	Power supply	Opened	Through services
Tokyo Metro lines							
3	Ginza	Asakusa – Shibuya	14·3	1 435	600 V DC *	1927-39	–
4	Marunouchi	Ikebukuro – Ogikubo	24·2	1 435	600 V DC *	1954-62	–
		Nakano-sakaue – Honancho	3·2				–
2	Hibiya	Kita-senju – Naka-meguro	20·3	1 067	1·5 kV DC †	1961-64	Tobu, Kita-senju – Tobu-dobutsukoen, 33·9 km; Tokyu, Naka-meguro – Kikuna, 16·6 km
5	Tozai	Nakano – Nishi-funabashi	30·8	1 067	1·5 kV DC †	1964-69	JR East, Nakano – Mitaka 9·4 km; JR East, Nishi-funabashi – Tsudanuma, 6·1 km; Toyokosoku, Nishi-funabashi – Toyo-katsutadai, 16·2 km
9	Chiyoda	Kita-ayase – Yoyogi-uehara	24·0	1 067	1·5 kV DC †	1969-79	Odakyu, Yoyogi-uehara – Hon-atsugi, Karakida, 52·5 km; JR East, Ayase – Tonde, 20·9 km
8	Yurakucho	Wakoshi – Shin-kiba	28·3	1 067	1·5 kV DC †	1974-88	Seibu, Kotake-mukaihara – Hanno, 40·3 km; Tobu, Wakashita – Shinrin-koen, 18·9 km (to Line 13 in 2007)
Yurakucho New		Kotake-mukaihara – Ikebukuro	3·2	1 067	1·5 kV DC †		(will be connected to Line 13 from 2007)
11	Hanzomon	Shibuya – Oshiage	16·8	1 067	1·5 kV DC †	1978-2003	Tokyu, Shibuya – Chuo-rinkan, 31·5 km; Tobu, Oshiage – Minami-kunhashi, 50·2 km
7	Namboku	Meguro – Akabane-iwabuchi	21·3	1 067	1·5 kV DC †	1991-2000	Tokyu, Meguro – Musashi-kosugi, 9·1 km Saitama Railway, Akabane-iwabushi – Urawa-Misono, 14·6 km
13	Line 13	Ikebukuro – Shibuya	8·9	1 067	1·5 kV DC †	2007	Tokyu, Shibuya – Yokohama (from 2012)
Toei lines							
1	Asakusa	Oshiage – Nishi-magome	18·3	1 435	1·5 kV DC †	1960-68	Keisei, Oshigae – Narota-kuko, Higashi-narita, 70·6 km; Hokuso, Kodan – Oshiage – Inba-nihon-ida, 32·3 km; Keikyu – Senhakuji – Misakiguchi, Shin-zushi, 73·4 km
6	Mita	Nishi-takashimadaira – Meguro	26·5	1 067	1·5 kV DC †	1968-2000	Tokyu, Meguro – Musashi-kosugi, 9·1 km
10	Shinjuku	Shinjuku – Motoyawata	23·5	1 372	1·5 kV DC †	1978-89	Keio, Shinjuku – Hashimoto, Takaosen-guchi, 67·3 km
12	Oedo	Hikarigaoka – Kiyosumi-shirakawa	40·7	1 435	1·5 kV DC †	1991-2000	(small-profile loop line)

* Third rail † Overhead bar conductor ‡ Overhead catenary



A programme of station enhancements is underway to make the complex network easier to use. This includes lifts giving disabled access to the platforms (left), new colour-coded signs and standardised station numbers (above left) and service managers to assist passengers at principal stations (above right)

although it has not yet been decided whether to use eight or 10-car trains or a mix of both.

Freedom to invest

The restructuring of Tokyo Metro has allowed the company to expand its business activities, and to branch out into commercial investment ventures beyond the metro network. The driving philosophy behind this strategy is 'efficient use of capital'.

Nevertheless, there are four major projects underway across the network to enhance the quality of services provided. The first of these is to provide barrier-free disabled access at all stations, including the installation of escalators, lifts and disabled toilets. The 'Restroom Clean-up Campaign' launched in February 2004 will see the cleaning and modernisation of 187 toilet facilities at 143 out of the 168 metro stations.

A related project launched in the light of the Taegu metro fire in South Korea is to improve fire prevention and suppression measures across the network.

A third programme covers the upgrading of ticket vending machines and gates at a cost of ¥15m. At present Tokyo Metro is part of the Passnet group, which operates a magnetic stored-value ticket valid on 27 railways across the Tokyo region. There is another grouping offering a magnetic stored value card for a similar number of bus companies, and both organisations have agreed that the two systems will be replaced by a common smart card.

JR East's Suica IC card is already being used by around six million commuters, so the other operators have reached agreement to share the technology. From the financial year beginning on April 1 2007, passengers will be able to use a single smart card on 57 rail and bus companies across the greater Tokyo region.

The fourth network-wide investment project is designed to improve passenger information facilities. With its very high-density network proving complicated for occasional users, Tokyo Metro is looking to simplify and clarify the information provided. As part of a city government initiative to boost tourism and sightseeing, Tokyo Metro and Toei have adopted a common policy to give all lines an identifying letter and each station an identifying number.

The letters and numbers shown on a new network map form the basis of colour-coded signs at all stations, together with international-standard pictograms for basic facilities. During 2004, the new signage was being evaluated at Ginza and Otemachi stations. By the end of the 2005 financial year, 83 stations will have been re-equipped at a cost of ¥17·7bn.

A related initiative is the introduction of roving 'service managers' at the busiest and most complex stations, able to assist unfamiliar passengers with questions about fares, interchanges and which exit to use to reach key places in the local neighbourhood. As of April 2005, 55 managers had been dispatched at 11 stations. Tokyo Metro is also introducing pre-recorded English-language announcements on its trains.

Combining passenger benefits with commercial investment is a programme to enhance station services through the provision of space for third-party retailers. By the end of February 2005, Tokyo Metro had opened 61 stores at 23 stations, with tenants ranging from convenience stores to coffee shops, café-restaurants, florists, and other services.

Another profitable venture is the construction of business hotels, offering economically-priced accommodation in the heart of the capital. In 2004 Tokyo Metro started work on the first of two pilot projects where it owned convenient plots of land. The first at Kiyosumi-shirakawa opened in March 2005, built on a former construction site for Line 11. The second will be at Toyocho on the Tozai Line, where land has been released by the demolition of a former substation which has been relocated underground. ■

Full platform screen doors were fitted on the ATO-equipped Namboku Line opened in 2000, and Tokyo Metro is testing half-height barriers and gates to improve platform safety on the Marunouchi Line