

Through Service Between Tokyu Toyoko Line and Tokyo Metro Fukutoshin Line: Overview and Effects

Tokyu Corporation

Overview of Through Service

The Tokyu Toyoko Line started through service to and from the Tokyo Metro Fukutoshin Line on 16 March 2013, creating a new artery for the greater Tokyo area by linking to the Tobu Tojo Line and Seibu Yurakucho and Seibu Ikebukuro lines via the Tokyo Metro Fukutoshin Line from Shibuya. As a result, railway passengers in greater Tokyo now enjoy shorter travel times with no need to change trains at Shibuya.

The start of through services eliminated above-ground operations on the Toyoko Line at Shibuya Station, which had functioned as a second-story terminal since the line opened. All functions were moved underground to the Tokyo Metro Fukutoshin Line at Shibuya Station that was already in operation. The former Toyoko Line Shibuya Station had undergone major renovations ahead of the 1964 Tokyo Olympics and its impressive design featuring a cylindrical roof and eye-shaped wall panels was a popular Shibuya landmark. Many users regretted its closing and came to mark the last day of the station's operation on 15 March.

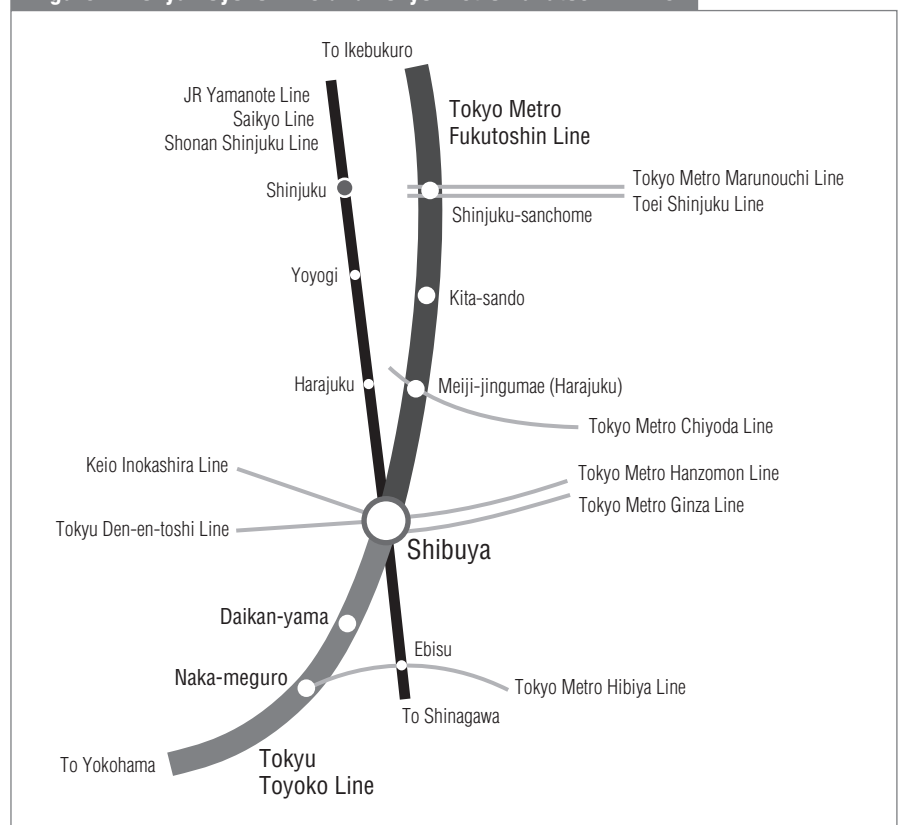
The switch involved more than just moving the station functions underground. The Toyoko Line tracks also had to be relocated underground and Tokyu Corporation conducted the relocation construction so as to continue uninterrupted train operations and not inconvenience passengers. The method had only ever been used for prior line switchovers by Tokyu Corporation and involved large-scale work in the Shibuya urban area. As a result, the switch was covered extensively by the media due to the unique conditions, and high technology level.

Promotional Activities Related to Start of Through Service

The huge project involving through services between five companies in Greater Tokyo and the relocation of the giant Shibuya terminal attracted great public interest and the participants—with Tokyu Corporation at the heart—held the following events to promote the project:

- Track bolt fastening ceremony (morning 15 March)—Tokyo Metro President Yoshimitsu Oku and Tokyu Corporation President Hirofumi Nomoto fastened bolt in track connected by through service.
- Press conference on through service (morning 15 March)—Presidents of Tokyo Metro and Tokyu Corporation outlined importance and objectives of through service.

Figure 1 Tokyu Toyoko Line and Tokyo Metro Fukutoshin Line





Track bolt fastening ceremony attended by Tokyo Metro President Yoshimitsu Oku and Tokyu Corporation President Hirofumi Nomoto (Tokyu Corporation)



Press conference on through service by Tokyo Metro President Yoshimitsu Oku (right) and Tokyu Corporation President Hirofumi Nomoto (left)

(Tokyu Corporation)



Last train arrival at the old Tokyu Toyoko line Shibuya Station

(Tokyu Corporation)



Greetings and salutes by stationmaster of Shibuya

(Tokyu Corporation)

- Ceremony commemorating through service (afternoon 15 March)—Events held by communities along connected lines, including stalls serving local delicacies, Yokohama Chinatown lion dance, Kawagoe drum performance, and exhibition of booths introducing communities.

- Greetings and salutes by stationmaster of Shibuya to users and media after closing former Toyoko Line Shibuya Station. (late evening 15 March)
- Construction to switch to underground track near Daikanyama Station (explained below).



Construction to switch to underground track near Daikanyama Station

(Tokyu Corporation)



Departure ceremony by presidents of five railway companies and stationmaster

(Tokyu Corporation)

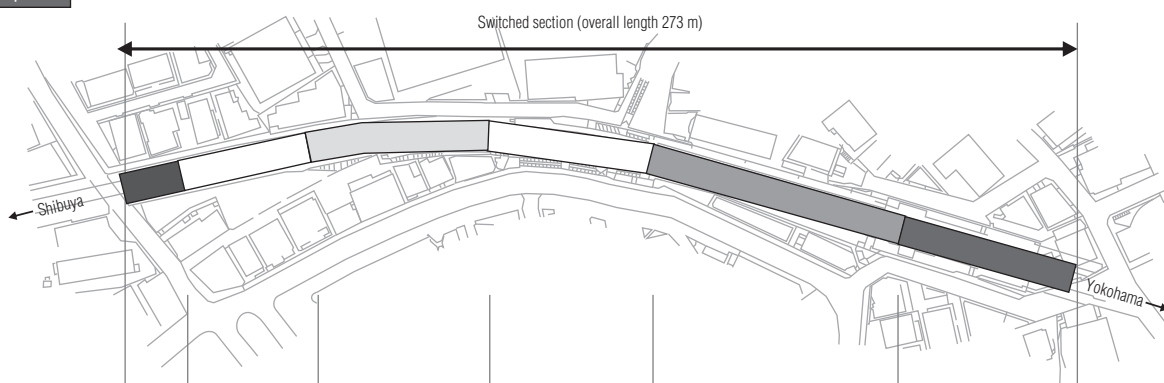
- Departure ceremony (early morning 16 March)— Presidents of five lines connected by through service held ribbon cutting ceremony in front of first outbound train from Toyoko Line Shibuya Station.

Construction to Switch to Underground Track Near Daikanyama Station

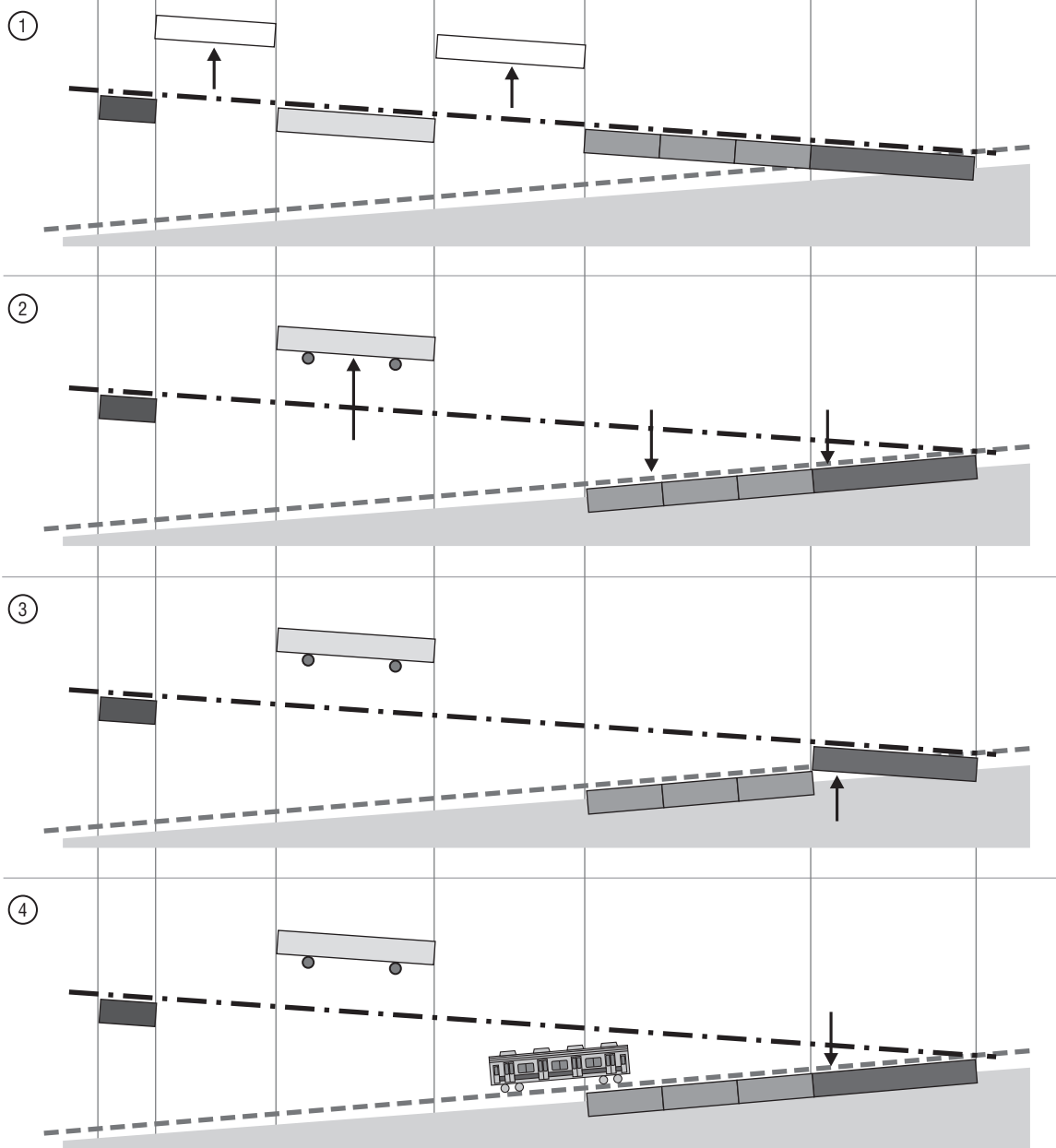
In the construction to switch to underground track at and near Daikanyama Station, about 1200 workers from Tokyu

Figure 2 Overview of Construction to Switch to Underground Track at and near Daikanyama Station

Ground plan



Profile



Corporation and partners worked to switch to track directly under the previous above-ground track for about 273 m from Shibuya level crossing No. 1 to Daikanyama Station platform. This was done in 3.5 hours between the last train on 15 March and the first train on 16 March. Switching to the underground track eliminated one level crossing on the Toyoko Line (Fig. 2).

Switch details

- ① 00:54 on 16 March—After last (outbound out-of-service) train passed, disconnection and removal of rails, overhead catenary and platforms started. Next, construction girders removed by large cranes positioned near station. (Removed section)
- ② Daikanyama Station surrounded by dense housing and shops, so construction girders lifted and lowered using jacks to secure passage for trains in locations where difficult to position cranes.
Raised construction girders removed gradually after start of through service. (Lifted section and lowered section)
- ③ Underground rails and overhead contact lines connected and platforms restored.
- ④ After inspections, inbound test-run train arrives at Daikanyama from direction of Nakameguro at 04:51 on 16 March. Test train runs safely, completing switch to underground track.

New Toyoko Line Shibuya Station

The new Toyoko Line Shibuya Station was built jointly by Tokyu Corporation and Tokyo Metro. Tokyu handled the design and actual construction with architect Tadao Ando commissioned for the design.

A variety of new techniques were used by this project to reduce environmental burdens with emphasis placed on creating the world's most environment-friendly station based on the catchphrase 'coexistence of people and nature'. Conventional stations are ventilated and air conditioned by fans forcing air through ducts but the new Toyoko Line Shibuya Station uses natural ventilation based on natural air movements without needing electrical power. As a result, the three-story oval atrium connects the station centre directly to Shibuya Hikarie building, providing an exhaust path for waste heat from trains and cooler flows. The impressive *chichusen* underground 'spaceship' object has more than just visual design aspects, reducing the environmental burden by means such as promoting natural ventilation by radiative cooling and by alleviating heat build-up.

This elliptical globe described by Tadao Ando as a 'base for creation of urban culture floating deep underground' is embedded in the station space and measures 80-m long by 24-m wide.



Three-story oval atrium connecting station center and Shibuya Hikarie

(Tokyu Corporation)



Image of future development around Shibuya Station

(Tokyu Corporation)



A view of of new Shibuya looking southeast from a large crossing in front of the station
(Tokyu Corporation)

Effect of Through Service

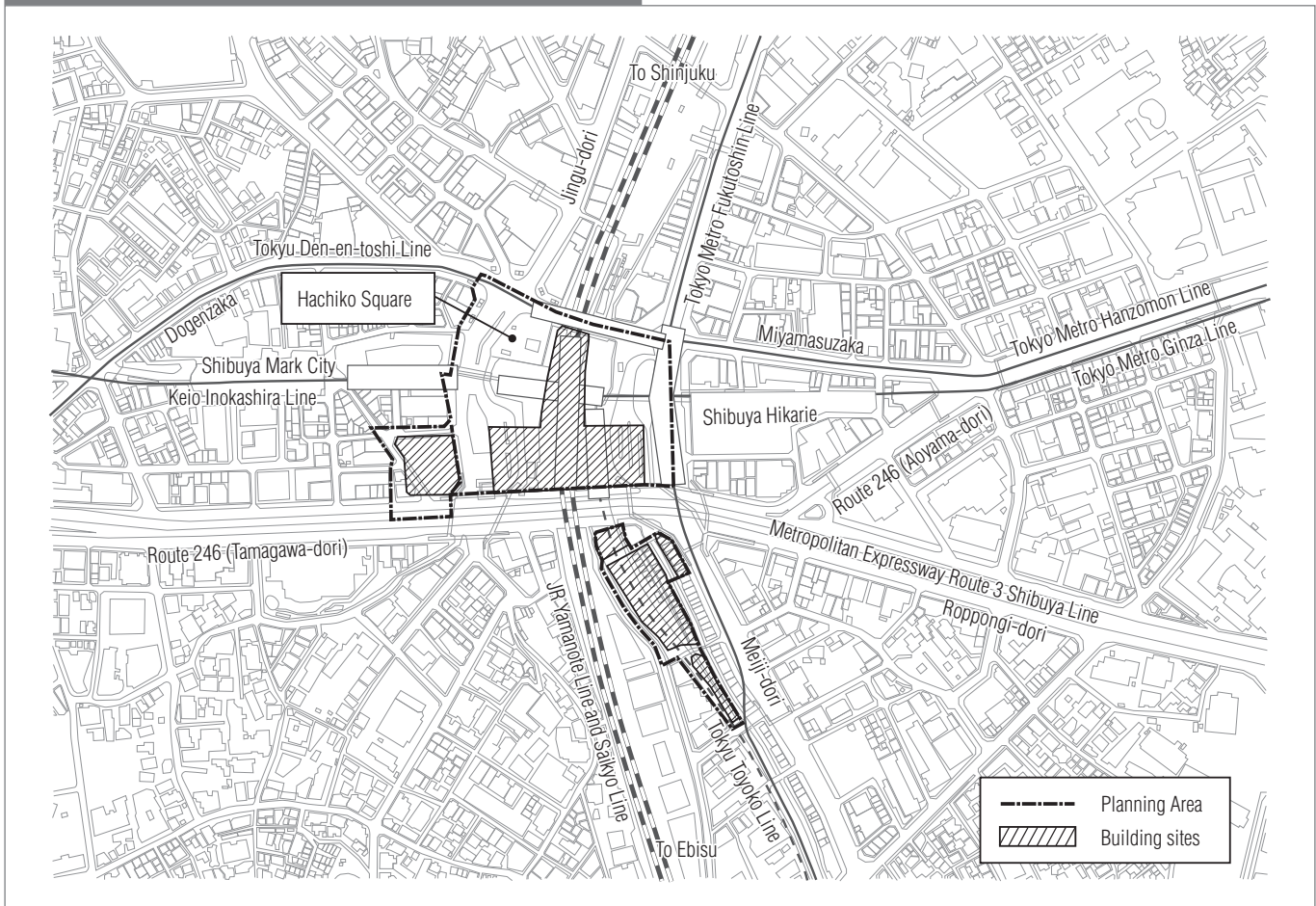
The start of through services has cut the weekday rush-hour travel time on the Toyoko Line (inbound trains from Yokohama to Shibuya) by about 2 minutes. Allowing

change-free travel to Shinjuku and Ikebukuro—where there are many offices and schools—has also increased the choice of routes for commuters. Direct trains on weekend and holiday mornings facilitate easy travel to leisure spots such as Kawagoe and Tokorozawa on the Tobu and Seibu lines.

With such increased convenience, Tokyu lines saw a 1.6% year-on-year increase in both commuter and non-commuter passengers from April to June 2013. The number of passengers travelling directly between Shibuya and Yokohama increased by a huge 13.1%. Popular tourist spots near Yokohama, Jiyugaoka, and Musashi-Kosugi stations, where a new commercial facility opened in April 2013, as well as other locations on the lines saw large increases in passenger numbers. The average increase for the Toyoko Line as a whole was 1.6%.

After the start of the through service, the Toyoko Line Shibuya Station was no longer viewed as a terminal, but

Figure 3 Shibuya Station Central Area Urban Development



even so the number of visitors to Shibuya has increased too. Sales in the underground floor of the Shibuya Hikarie building connected directly to the Tokyu Line Shibuya Station are good, and business in Shibuya is expected to be stimulated even more thanks to the through service.

As a result, Tokyu Corporation is expecting a ¥2 billion increase in fare revenues for all Tokyu lines in FY2013 compared to FY2012.

Development around Shibuya Station after Through Service Start

With the underground relocation of Shibuya Station, redevelopment of the Shibuya area including the site of the previous station is starting in earnest. Progress near Shibuya Station is based on the site designation as a 'Priority Development Area for Urban Renaissance' and on directives such as the 'Guidelines for Shibuya Station Central Area Urban Development'. The opening of Shibuya Hikarie in April 2012 was the first step in this redevelopment.

Tokyo Metropolitan Government accepted the urban planning proposals on 17 June 2013 for three projects in the special districts of Shibuya Station Area Development Plan,

Shibuya Station Dogenzaka Area Redevelopment Plan, and Shibuya Station South Area Development Project (district 21 in Shibuya 3-chome) designated for urban renaissance based on the Act on Special Measures Concerning Urban Renaissance. The building in the South Area Development Project is scheduled to open in FY2017 and that in the Dogenzaka Area Redevelopment Plan in FY2018. The former building is expected to become a new symbol for Shibuya following Shibuya Hikarie and is scheduled to open in stages with the east wing opening in 2020 and the central and south wings in 2027.

This redevelopment involves more than just large-scale buildings. It also includes passageways and multi-level pedestrian access to facilitate smooth movement of people through Shibuya and on to the railway lines. With this through-service enhancement of the network and redevelopment, Tokyu Corporation aims to make Shibuya the 'most attractive town in Japan'.

Acknowledgment

This article was contributed by Tokyu Corporation.