Feature

Minatomirai Line—Introduction to Stations

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Line, Stations and Mobility

Major features

The new 4.1-km Minatomirai Line runs from Yokohama Station—an existing rail hub—to Motomachi, entirely underground below central Yokohama (the existing Kannai business district and the Minato Mirai 21 district now being developed). There are six stations: Yokohama, Shin Takashima, Minatomirai, Bashamichi, Nihon-odori, and Motomachi-Chukagai (Fig. 1). During construction, the elevated platforms and station facilities for the Tokyu Toyoko Line at Yokohama Station were moved underground to allow the Tokyu and Minatomirai trains to use the same station and track.

The line construction had three main objectives:

- To create a rail transportation corridor for the Minato Mirai 21 district
- To connect the Yokohama Station district with the Minato Mirai 21 and Kannai districts, thereby consolidating central Yokohama, promoting new development in the area served by the new line, and strengthening Yokohama's business and commerce
- To permit through services with the Tokyu Toyoko Line, creating a transfer-free route from central Yokohama to central Tokyo as part of the expanding rail network of Greater Tokyo.

The operations company was established in 1989; construction began in November 1992 with commercial operations starting on 1 February 2004. Table 1 summarizes the line's main features.

Station design

After the start of Phase 1 in 1992, the architects were chosen based on their ability to design distinctive stations and to display a wide sensitivity for urban development. A Design Committee of these architects and designers with experience in signs and lighting was set up. The Committee met four times between June 1993 and March 1994, and sub-committees met eight times to discuss design implementation. They developed the following principles and design concepts to ensure imaginative stations.

- Each station to have own distinctive design
  For example, Yokohama was a gateway through which enlightened Western ideas entered Japan, and today, it is a gateway for information. Consequently, the station design should reflect this fact. Stations are more than places to board and alight from trains—they should also invite people to enjoy their ambience. This is intended to increase ridership.
- Stations designed to highest quality standards
  For example, to reflect Yokohama's position as a city of fashion, the station should harmonize with the aboveground surroundings and cityscape to create a public space that people will admire and view as an urban asset.
- Ideals to be met through refined designs not through use of expensive building materials

Each station design is based on the theme of originality and convenience to create a local asset. The features and ambience of the aboveground space continue into the underground station building, providing a continuum joining the city above with the transportation facility below. This concept became known as 'Urban Gallery Stations.'

Universal Design concepts were used to help all passengers, including disabled people, use the stations easily and in comfort and to ensure that the station buildings are easy to maintain and control. To achieve these design concepts, the Design Committee developed a consensus on common elements for all stations and

Figure 1 Route of Minatomirai Line

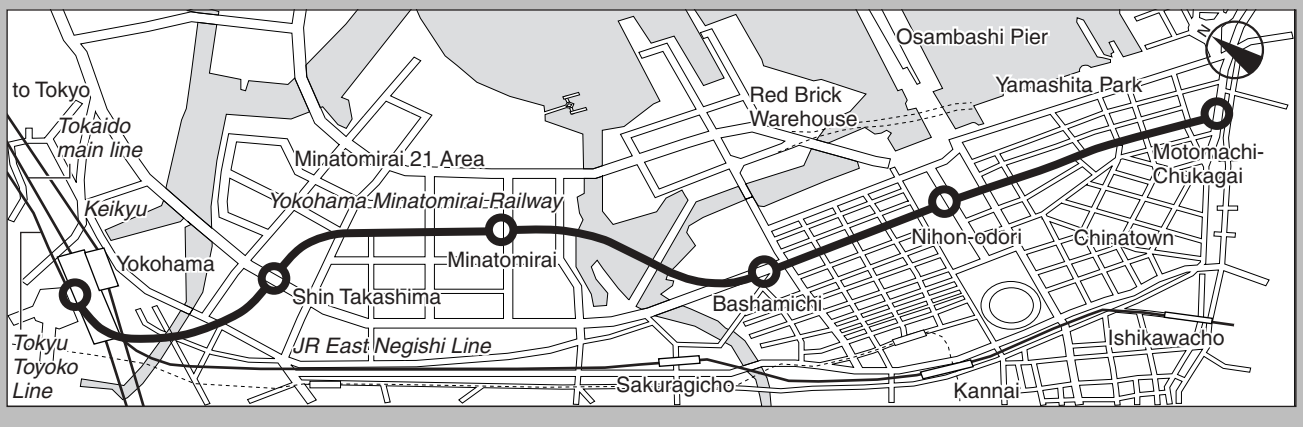


Table 1 Summary of Minatomirai Line

Operator	Yokohama Minatomirai Railway Company
Construction	JRTT (constructed as private railway line) Tokyu Corporation had control over operations and construction from the midpoint of Yokohama Station towards Shibuya (Tokyo). The Agency commissioned Tokyu to design and construct areas from the said midpoint to Motomachi-Chukagai.
Power supply	1,500 Vdc
Overhead system	Simple catenary
Control systems	Automatic Train Control (ATC) system, on-board signalling
Track gauge	1,067 mm, 50 N rail
Operations	8-car train sets; 302 operations on weekdays at 3-minute headway during rush hours

Station name (Centre-to-centre distance from Yokohama Station)		Yokohama (0 m)	Shin Takashima (840 m)	Minatomirai (1,680 m)		Bashamichi (2,580 m)		Nihon-odori (Prefectural government offices, Daisanbashi Wharf) (3,230 m)	Motomachi-Chukagai (Yamashita Park) (4,140 m)	
Projected daily number of passengers		136,000	4,000	37,000		44,000		33,000	26,000	
Station structure	Structural type	Box type; 5 underground levels	Box type; 5 underground levels	Arch type; 3 underground levels	Box type, 4 underground levels	Dome type; 3 underground levels	Box type, 4 underground levels	Box type; 3 underground levels	Arch type; 3 underground levels	Box type; 2 aboveground levels, 4 underground levels
	Platform depth below GL	Approx. 23.5 m	Approx. 27.5 m	Approx. 22.5 m		Approx. 22.0 m		Approx. 18.9 m	Approx. 24.3 m	
	Platform width and length	14.0 x 170 m	6.5 x 170 m	12.5 x 170 m		12.5 x 170 m		10.0 x 170 m	10.0 x 170 m	
Design		Tokyo Kyuko Electric Railway (Tokyu Architects and Engineers Inc.)	U.G. Toshi Kenchiku Co., Ltd.	Kunihiko Hayakawa Architect and Associates		Naito Architect and Associates		JRTT	Toyo Ito & Associates Architects	

station-specific elements as follows:

Common station elements

- The station design concept should express the personality of the area.
- The facilities and space should be user-friendly and offer convenience and security.
- The use of space should offer convenient functions.
- The atmosphere should be that of an 'urban gallery.'
- Signage should be common to all stations.
- Lighting should be functional and provide sufficient illumination.

Station-specific elements

- A distinctive message should be expressed through design.
- The 'urban gallery' concept should be interpreted variously.

Tactile tiles provide guidance to stations (JRTT)

- A unique ambience should created by lighting.
- The station furniture should be distinctive.
- The font for station names should be distinctive.

These elements were incorporated into the basic design to achieve the basic principles (design objectives).

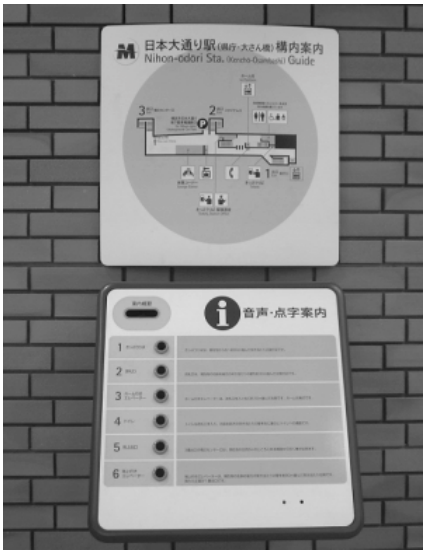
Facilities

The design of the Minatomirai Line followed the above-mentioned principles and the concepts established by the Design Committee, with barrier-free access—one of the common elements—providing mobility to the disabled and meeting the requirements of the Barrier-Free Transportation Law (November 2000). Even after construction contracts had been agreed, consultations with the constructors succeeded in introducing new developments meeting the mobility needs of passengers. For example, the 11-person elevators offer access to wheelchair users and at least one barrier-free route was constructed from ground level to platform at each station.

Escalators have an inverter variable-speed control system. Normally they move at 30 m per minute, but they can be adjusted without stopping to faster speeds of 40 or 45 m per minute. Since relatively few passengers are using Shin Takashima Station, to save energy, sensors were installed to reduce the escalator speed to 10 m per minute when there are no users.

Tactile tiles for the visually impaired were manufactured to new shape specifications and meet JIS standards. The tiles begin at the aboveground pedestrian area (which meets Yokohama municipal accessibility standards) and lead the visually impaired to the entrances, stairs, elevators, ticket machines, toilets and platforms. The tiles also lead past voice guidance devices. On the platforms, warning tactile tiles have newly designed raised ribs. Staircases are equipped with double handrails, and the Braille signs use stainless-steel materials.

The voice guidance uses chimes above entrances and exits, and at wickets. Bird songs provide further guidance at the bottom of platform staircases. The volume, interval between sounds and other specifications were determined by consultations and trials with visually impaired passengers.



Comprehensive voice guidance systems (JRTT)

Similar voice guidance is installed at the entrances to toilets and elevators also have voice guidance. Guidance at the

Voice guidance for toilet users (JRTT)


Multifunctional toilet (JRTT)

Ramp to eliminate gap and step for wheelchair users (JRTT)

escalators announces its direction up or down.

The Western-style toilets also have a built-in washlet bidet function and one booth has a handrail and baby chair. One multi-function booth in each male and each female toilet has a warm-water system for ostomates, as well as a fold-down cot large enough for an adult. A buzzer system to call for assistance is installed in each booth and individual toilets.

The second and seventh carriages in each train set have wheelchair space near a door. Platforms for both tracks have two places equipped with ramps to eliminate the gap and the level difference. Some wickets are constructed to a width of 900 mm, and some ticket vending machines have an open space under them for easier access by wheelchair users.

Minatomirai Station

Location

Minatomirai Station was constructed as a rail transit magnet for Minato Mirai 21, the most modern metropolitan centre in Yokohama. The centrally located station is near the Landmark Tower, Queen's Square, the National Convention Hall of Yokohama, hotels, a sightseeing boat dock, the Yokohama Museum of Art, an amusement park and other attractions. City planners envision a daytime working population of 190,000 and a residential population of 10,000. Many passengers come to the tourist attractions from outside the city. Facing Yokohama Bay, the district has the atmosphere and functions of a growing ultramodern urban centre.

Station design

The station's 'urban gallery' design brings the city's atmosphere and excitement into the transit facility below. Users are immediately aware they are in more than just a station—they are also in a place to stop a moment, pick up information, enjoy the ultramodern message, and perhaps interact with other people. They find it easy to orient themselves because structural components, though obviously functional and daringly beautiful, are arranged to provide open vistas and extend sight lines. The station location, close to the waterfront, is picked up by the design motif of ocean vessels—for example, the porthole windows for the season-ticket sales counter. The huge tube-enclosed underground space houses imaging and functional devices that add to the ultramodern design.


Bridge and illuminated wall at Minatomirai Station (JRTT)

Station core at Minatomirai Station (JRTT)

Bank of triple escalators at Minatomirai Station (JRTT)

Bashamichi Station

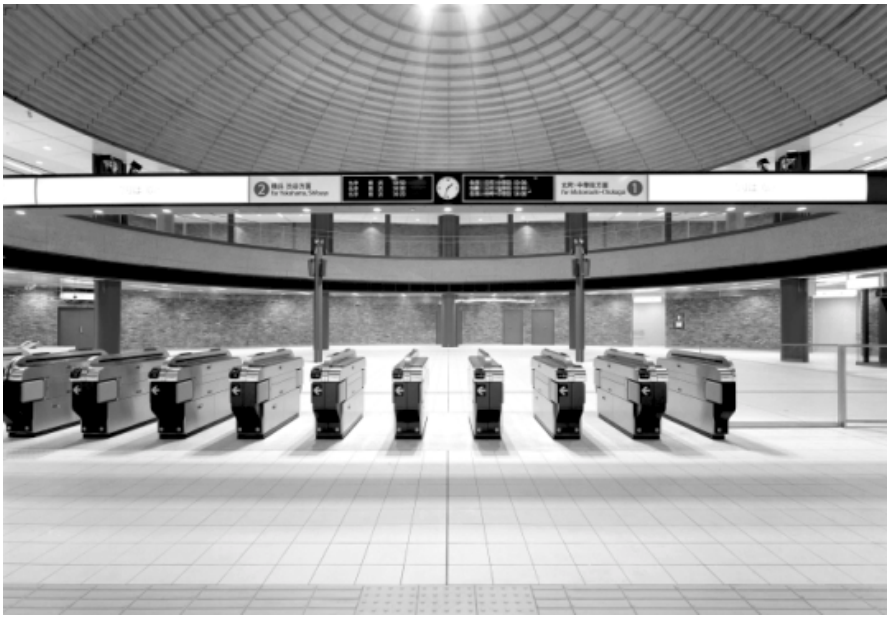
Location

Bashamichi Station is between the Shinko (New Port) district in Minato Mirai 21 and the historic Kannai-Bashamichi district now famous as the first place near Tokyo to open to foreign trade (mid-1800s). Attractions in the Shinko district's leisure centre include Yokohama World Porters, the import promotion and commerce/distribution facility, and the former redbrick warehouses refurbished as a shopping centre. Bashamichi and nearby streets have old buildings in the classic style, including the Kanagawa Prefectural Museum of Cultural History and the Teisan Warehouse. The area combines newly developed districts with historic old ones. The Bashamichi shopping district is noted for its many 'first in Japan' developments that still remain to this day, taking visitors back to when Japan opened up to the West.

Station design

The station has three underground levels. A domed atrium-like space rises in the central part of Lower Level 2 with other high spaces on either side. The part of the station closer to the Motomachi-Chukagai terminus was constructed in tandem with a project to build underground infrastructure traversing Yokohama. Near the other end of the station, Lower Level 1 is linked underground to the Yokohama I-Land Tower, a tall property associated with urban renewal.

The station's location suggested the main design theme—past contrasting and blending with future. The outer part of the underground structure glances back at the past, while the inner space looks to the future. For example, supporting walls



Ticket wicket at Bashamichi Station (JRTT)

along the outer side of the concourse and the façade around the central dome at Lower Level 2 are faced with real brick from the Meiji period (1868–1912).
The wall of one of the high concourses displays parts of the vault, banisters and other features of the headquarters of the former Bank of Yokohama that once stood in the area as *objets d'art*. The other airy concourse is ornamented by a massive 45-m long relief created by the late Jumpei Nakamura for the same bank. This work adds to the impressive atmosphere of the station and preserves a part of the city's cultural heritage. Its reuse in the station was made possible through joint efforts of a heritage conservation association, the Bank of Yokohama, and Yokohama City.

Wall from previous structure preserved for design purposes at Bashamichi Station (JRTT)

Old construction materials preserved for design purposes at Bashamichi Station (JRTT)

Motomachi-Chukagai Station

Location

The last station on the line—Motomachi-Chukagai Station—is between the old foreign residential district and the popular Motomachi shopping district. The first part of the station name comes from the shopping district and the second from the nearby Chinatown tourist attraction. The station is the closest to other Yokohama landmarks, including Yamashita Park, Minato no Mieru Oka Park and the foreigners' cemetery.
The Yokohama Minatomirai Railway Company HQ is above one of the station's entrances, giving it an even more prominent position on the line.
After Yokohama opened up to foreign trade in the mid-1800s, this area became a residential and business district for foreigners where foreign culture entered Japan, and Japanese culture was carried to other countries.

Station design

Due to its location, designers knew that the station would attract both large numbers of commuting workers and students as well as a relatively large number of casual passengers, especially shoppers, tourists, and people eating out and visiting other attractions. Consequently, they designed the space for users to 'read a story' as they pass from the aboveground entrance to the underground concourse and platform. The story is illustrated throughout the station, showing the history from when the port opened to foreign trade.
The illustrations—194 old photographs—were reproduced on 1-m^2 ceramic tiles under the direction of the Yokohama Archives of History, using their resources. The slightly tinted photographs blend well

with the white tones of the station interior, and the lighting adds to the feeling of unhurried, dignified space.

Tiles in the boarding concourse show the culture of the time and objects associated with the city's early beginnings, while the stairwell leading to Chinatown shows Chinese festivals and streetscapes of the nearby Yamashita district. Tiles in the alighting concourse show scenes of the Motomachi and Yamate districts before WWII.

An arched ceiling over the central part of the platform provides a large open space with a height of 10.5 m. The wall illustrations here consist of small dots forming just a mosaic when seen from close up, but reveal urban scenes when viewed from a distance. The illustrations on the Yokohama Bay side show port scenes, while the landward side shows scenes of Motomachi and Chinatown. The overhead high space has graphics too, offering subtle reminders of the local scene when facing that direction. Passengers on the down escalator descend through an airy space to a wide, white space below with tracks or waiting trains. ■

Concourse to first station platform on line at Motomachi-Chukagai Station (JRTT)

Space defined by dome over platform at Motomachi-Chukagai Station (JRTT)

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