

Oedo Line Station Design and Public Art

Toru Hiraide

Outline of Oedo Line

When the 41-km long Oedo Line was opened fully on 12 December 2000, it became Tokyo's first loop subway. Although it is now the twelfth of 13 subway lines in the Tokyo Metropolitan Area (Fig. 1), it is still a hot topic of discussion because the designers went far beyond traditional station concepts by introducing a full-scale architectural design including public art as described in this article.

The line runs through six of Tokyo's subcentres (Fig. 2) each characterized by different urban activities. The line has a 13-km radial section connecting the north-western residential area with the business area around the Shinjuku hub,

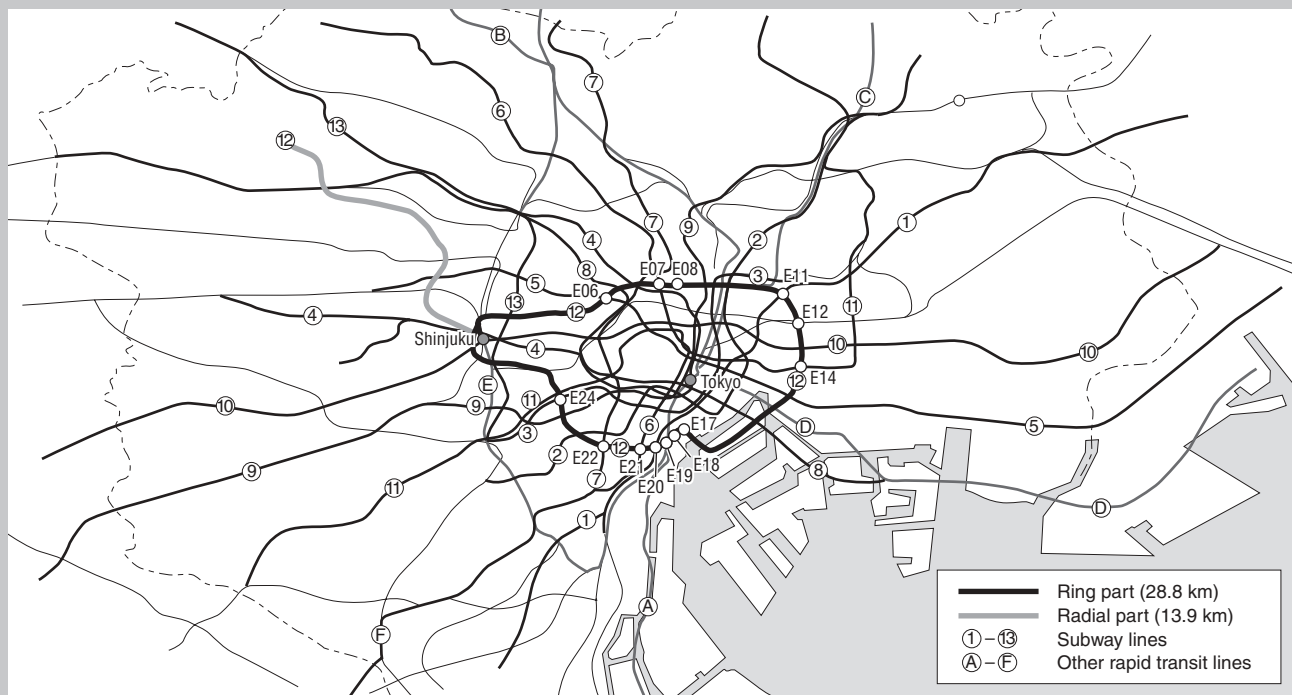
plus a 28-km loop encircling Tokyo's central business district (CBD) and connecting the western commercial, southern waterfront, eastern old downtown, and northern cultural areas. As a result, the architecture of each station and its public art largely reflects the local characteristics of each area.

Since the line consists of a large main loop with 'side handle,' its nature is somewhat different from Tokyo's predominantly radial lines carrying large numbers of commuters between the suburbs and central Tokyo during the morning and evening rush hours. As a result, to avoid the many underground obstructions along the route in central Tokyo, the specifications for conventional lines were modified to permit building of a smaller cross-section tunnel (Fig. 3) operating

smaller rolling stock. Furthermore, a linear motor drive (running on steel wheels) was used to negotiate the required sharp curves (100-m radius min.) and steep grades (55 per mill max.).

Construction took 8 years from 1992 until December 2000 and there are 44 intersections with other railways including newly planned lines. No less than 200 large-scale urban facilities had to be protected during construction and the excavation depth went as deep as 47 m. The works were technically very difficult and pioneering techniques were used to shorten the construction period and overcome the difficult conditions, making the entire line an exhibit for underground engineering technologies.

Figure 1 Tokyo's Rapid Transit Network



1. Tokyo Metropolitan Government (TMG) Asakusa Line
2. Tokyo Metro Hibiya Line
3. Tokyo Metro Ginza Line
4. Tokyo Metro Marunouchi Line
5. Tokyo Metro Tozai Line

6. TMG Mita Line
7. Tokyo Metro Namboku Line
8. Tokyo Metro Yurakucho Line
9. Tokyo Metro Chiyoda Line
10. TMG Shinjuku Line
11. Tokyo Metro Hanzomon Line

12. TMG Oedo Line
13. Tokyo Metro No. 13 Line (under construction)

- A. Tokyo Monorail
- B. JR East Saikyo Line
- C. *Tsukuba Express*
- D. JR East Keiyo Line
- E. JR East Yamanote Line
- F. Tokyu Toyoko Line

Figure 2 Tokyo Subcentres Served by Oedo Line



Station Design and Public Art

Expanding the conventional transport role of subways, the Oedo Line stations were designed to enhance the culture and amenity of areas along the line and to stimulate citizens' creativity. In addition, each station space was designed to ameliorate passengers' feelings of confinement caused by the smaller size compared to conventional stations.

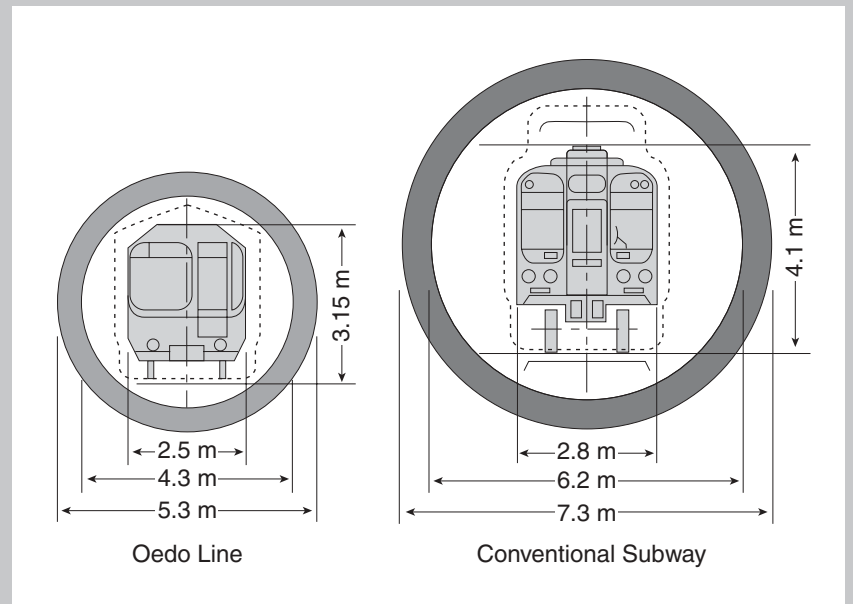
Fifteen private architects were selected by screening 77 proposals and each was required to reflect the area's characteristics in the station architecture as far as possible, while accounting for the basic functions needed by a subway station.

Furthermore, space for artworks (public art), or so-called 'space of ease,' was designed into each station as an attempt to create a cultural underground environment; displayed works were selected from a large number of proposals. The rest of this article describes representative station designs and public artworks based on these design elements.

Functionality

First priority was given to the essential requirement that passengers can use stations safely and comfortably. Spaces

Figure 3 Tunnel Sections of Oedo Line and Conventional Subway



Series 12000 for Oedo Line

(Author)

such as entrances, stairs, passages, platforms, etc., are segmented for easy recognition and visual impressiveness. Moreover, feelings of depth and width are increased in potentially monotonous and

boring spaces to give a sense of relief, peace and openness.

Shiodome Station (E19) is located in the centre of a redevelopment area for a large-scale business park. The area's



Concourse at Shiodome Station (E19)

(Author)



Exit at Azabu-Juban Station (E22)

(Author)

characteristics are symbolized by two colours: silver representing future prospects, and white representing an international, sophisticated image. Azabu-Juban Station (E22) is located in a stylish popular uptown area with many embassies and a high proportion of foreigners. The high-design-sense entrance using laminated glass for the ceiling and upper walls gives the impression of the area's future development.

Area Characteristics and Cultures

Areas with strong characteristics demand highly symbolic features. Area characteristics (history, culture, exchange

of information between people, future development, etc.) are incorporated into stations so that they can be cherished and used by citizens and passengers as part of the locality.

The enamel-panel trackside wall at Kuramae Station (E11) represent the facades of warehouses on the nearby Sumida River where there were many rice warehouses in the Edo period (1603–1867) when government taxes were levied in *koku* (about 5 bushels or 180 litres) of rice. This imagery presents a familiar station that passengers can recognize from the Kuramae symbology.

Ryogoku is the centre of sumo, Japan's national sport. The history and permanence of sumo, and the beauty and strength of the *yokozuna* grand

champions are expressed dynamically by the granite statues at Ryogoku Station (E12). The three stone objects represent the yokozuna's ceremonial entrance into the *dojo* ring.

Infrastructure (Iidabashi Station)

Although subways are gigantic, most of the structure cannot be seen directly. At Iidabashi Station (E06), the hardly visible station structure has been made as visible as possible. The intention was to build a station with exposed engineering structures that passengers would not normally see to expose the technologies and mechanisms of the modern subway. This design indicates the future



Trackside wall at Kuramae Station (E11)

(Author)



Abstract Statues at Ryogoku Station (E12)

(Author)



Platform at Iidabashi Station (E06)

(Author)



Station structure at Iidabashi Station (E06)

(Author)

possibilities of fusion between civil engineering and architectural techniques. The web-like framing called 'web-frame' serves both for illumination and ceiling where there is no finishing. It gives rhythm to monotonous sections like long stairs while its see-through structure is not oppressive. It also creates an image of the transport and information networks spreading across a city.

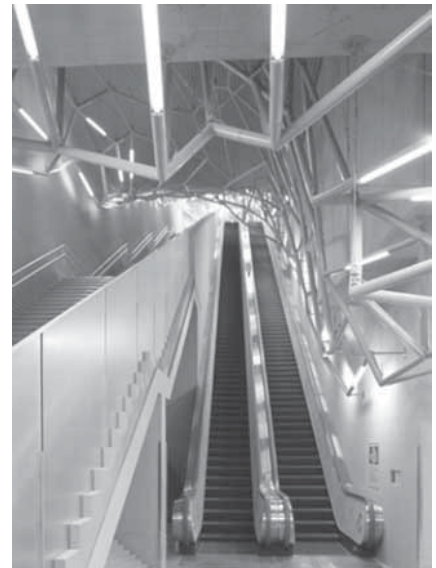
The design adopted a sense of space. For example, the platforms make direct use of the shield tunnel structure and highlighted arch, which also expresses the strong sense of a large and deep urban infrastructure. Improvements in construction accuracy and quality at Iidabashi Station made it possible to put underground civil engineering structures

ahead of architectural finishes. Most pillars have a concrete finish that emphasizes unity with surrounding space.

Colouring

To ameliorate any impressions of confinement inherent in underground spaces, basic colours are gentle monotonous. However, different colours and designs are used purposely to facilitate visual recognition and emphasize spatial characteristics.

For example, optical fibres and LEDs on the back of bronze glass blocks at Akabanebashi Station (E21) are switched on and off by sensors to allude to the fireflies that were abundant in this hilly area.



Escalator and stairs at Iidabashi Station (E06)

(Author)



Art wall at Akabanebashi Station (E21)

(Author)



Stairway at Kasuga Station (E07)

(Author)

The many entertainment and education facilities near Kasuga Station (E07) are symbolized by the red wavy ceilings full of liveliness.

Materials

One of the basic design specifications was that materials should be stainless and durable. Taking this together with design and cost effectiveness, a variety of materials were used, including metals, ceramics, concrete, stone, and glass. In particular, low-cost natural stone purchased overseas helps create a sense of massiveness and

calmness. Some materials were used as main design themes to create impressive spaces where the beauty and massiveness of materials are felt strongly. On the other hand, attempts were made to save resources and energy by using substantial amounts of recycled and minimum-maintenance materials.

Aoyama town has a high fashion sense and sophisticated foreign image, leading to a design convergence on glass materials at Aoyama-Itchome Station (E24). For example, pillars on all floors are encased in laminated glass.

Since Kiyosumi-Shirakawa Station (E14) is in an old industrial area, scraps from

various industrial products produced there during the high economic growth period were used to produce a work called *Fossils of 20th Century Culture*. Out of environmental consideration, images of public transportation, automobiles, industry, banking, computers, future prospects, etc., have been created by attaching recycled steel plates and scrap materials to the entire length of the platform trackside walls.

Lighting

Main, indirect, wall lighting, etc., are used



Platform at Aoyama-Itchome Station (E24)

(Author)



Trackside wall at Kiyosumi-Shirakawa Station (E14)

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Concourse at Hongo-sanchome Station (E08)

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Concourse at Daimon Station (E20)

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according to the space characteristics. Shading is achieved by contrasting line and down lighting for a spacious impression. Lighting emphasizes dead-end walls, while light walls or mirrors create depth in narrow joint-use spaces. The concourse at Hongo-Sanchome Station (E08) has a bright circular hall surrounded by internally lit glass walls. The optical performance of light walls (ground glass) and mirrors (tapetum glass) creates a distinctive impression in this narrow, long station.

The concourse at Daimon Station (E20) is finished entirely in monotoes (silver and black). Consideration was made to create a familiar space by illuminating the ceiling with soft indirect lighting from behind aluminium panels.

Artworks

The Oedo Line was also expected to contribute to revival of traditional crafts and local cultures. Artworks at each ticket gate help enhance the character and charm of each station, making the entire line almost an 'underground modern art gallery.' Each piece was sponsored by a private company, with no public funds used to create the art gallery.

Tsukiji is an old Edo area where *ukiyo-e* woodblock printing flourished, so a modern painting on the theme of an *ukiyo-e* painter at Tsukijishijo Station (E18) was redeveloped as a large mural that will endure long into the future.

A classic painting centred on Triton, the son of Poseidon (Greek god of the sea), and his wife Amphitrite, focusses Kachidoki Station (E17) as the gateway to Tokyo's waterfront.

Outcome and Future Expectations

What change has been achieved by abandoning the conventional station



Art wall at Tsukijishijo Station (E18)

(Author)



Art wall at Kachidoki Station (E17)

(Author)

design process? Certainly, the Oedo Line stations are no longer just points of passage, but are locations with characteristic identities. Talented architects applied their skills to the full, using colour and materials in space design. In addition, cost efficiency was pursued by spending more money on important parts, but by using economic materials elsewhere. As a result, some very notable station architectures have been completed at even lower cost than conventional stations.

At 20 to 40 m below ground level, the Oedo Line is the deepest underground

public art space in the world and presents a new subway that extends the concept of simple station design.

Most areas traversed by the Oedo loop are old towns with a long and rich history and construction of the line helped trigger many redevelopment projects, creating communities where people work, live, and relax while preserving traditions.

Hopefully, the Oedo Line will make a major contribution to Tokyo's rebirth in the 21st century in the same way that the first railways and subways stimulated the city's growth early last century. ■



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Mr Hiraide has been engaged in the consolidation of Tokyo's rapid transit system as an engineering official of the Tokyo Metropolitan Government for 40 years after graduating in civil engineering from Kyoto University in 1964. He is now the Technical Director of the Tokyo Metropolitan Subway Construction Corporation and also serves as a tunnelling expert at the Japan Society of Civil Engineers.