Subways have almost 150 years tradition in Europe and a little bit more than 80 years in Japan. They are one of the most popular and most efficient means of urban transportation. Connected with other railways and extending out from the inner city, they are basic infrastructure of the rapid transit. Like railway stations above the ground, underground subway stations are important elements of the urbanscape that are determining the image of the city. Therefore already in the past, aesthetic design of subway stations has been recognized at historical European stations. However, only recently subway station design has been getting more challenging and totally-oriented.

Station form depends on several aesthetic visual and image-based factors. These factors include space, light, color, scale, and details, as well as image-based elements related to design context, landmarks features, representation of the image of subways, of a brand of train operators, inclusion of artistic elements, relation of station design to commercial function and advertisements.

Nowadays, subway stations are being renovated and also new stations are being built. This paper examines current trends in design of subway stations in Japan and Europe on the example of Tokyo, Paris, London and Berlin. The conclusion is that design depends very much on the circumstances such as natural conditions, organization and funding of subways, design process, tradition and culture. While in Japan subway stations tend to be economical with only some design elements, in Europe design is more holistic and involves world famous architects. Many stations in Japan have been renovated and design has improved but there is still need to develop a total approach to station architecture and design.

1. BACKGROUND

Underground rapid transit system is usually called “metro”, although in English speaking countries the terms subway and underground are used. The rapid transit system varies greatly between cities but has usually common feature that in larger metropolitan areas the underground system extend only to the limits of the inner city, or to its inner ring of suburbs with trains making frequent station stops. The outer suburbs may then be reached by a separate commuter rail network, where more widely spaced stations allow higher speeds. Rapid transit systems are often supplemented by other systems, either buses, trams including LRT (Light Rail System) or commuter rail.

Underground stations are part of the infrastructure that allow passengers to board and disembark from trains. They need to be functional – well accessible and easy to understand – and at the same time – comfortable and aesthetical – reflecting the heritage and modernity of engineering and architecture.

Subway stations have had the tradition of good design in the past, and at the present railway companies are trying to renovate historical stations and to design splendid new ones. This paper analyzes trends and compares aesthetic design of Japanese and European subway stations.

1.1 DEVELOPMENT OF SUBWAYS

Rapid transit evolved from railways during the late 19th century. First underground railway lines were constructed in Britain. The introduction of subways was seen as a big achievement: some
called it a great engineering triumph of the day. The first underground railway in London, opened in 1863 by the Metropolitan Underground Railway, was the Metropolitan Line, which ran on the distance of 6 km from Paddington to Farrington. The four contemporary London’s lines have developed from Metropolitan and District Lines, which were built using the “cut and cover” tunnels. Later, since 1890, lines were built deeper in circular tunnels. First deep lines were built for the City (1890) and South London Railway (1890).

The second oldest underground after Britain (London and Glasgow) in the world was the Budapest Metro, which is a metro system in the Hungarian capital. Its Line 1 was built in 1894-1896. The technology swiftly spread to other European cities, and then to the United States, where a number of elevated systems were built, starting in New York in 1868.

In France, underground railways in Paris were intended to improve public transport, particularly on the eve of Great Exhibition, which was to be held in 1900. The work, for which mostly responsible was French engineer Fugence Bienvenüe, began in 1898 on Line 1 that ran from Ponte de Vicennes to Port Maillot on east-west axis through the city. Unfortunately Paris Métro (Chemin de fer Métropolitaine), at that time known as Metropolitan, did not open before the exposition but few months later in 1900. In the early years the tunnels were excavated using the flying arch method and crossings through the River Seine were on viaducts. Later the network was extended using conventional methods and tunnels were built under the river. Paris Métro was fifth in the world, having followed London, Glasgow, Budapest, and Boston.

Berlin has got its first U-Bahn line mostly elevated in 1902. Subsequent development was in 1923-30, when Berlin received basic subway network of 76 km.

In Japan, the history of subways began in Tokyo in 1927, when a 2.2 km stretch of line was opened between Asakusa and Ueno (current Ginza Line). Tokyo Metro (Tōkyō Metoro) was launched in 2004 after the privatization of the Teito Rapid Transit Authority (TRTA, Eidan chikatetsu) that was established in 1941, as a descendant of private operator - Tokyo Underground Railway Company (1920), Tokyo Metro is operating and managing underground railways in Tokyo and it is also profiting from other activities, such as real estate, commerce at the stations and media businesses.

1.2 AESTHETIC CONSIDERATIONS IN THE PAST

Subways in Britain were from the beginning designed with aesthetic thoughts. The architect of London’s stations - Charles Holden (1875-1960) - was the master of traditional classical forms. He has an excellent knowledge of new constructions and materials. Instead of superficial decoration, he was concerned with functional problems. Therefore the design for London’s underground stations features simple and functional Modernist forms. The aesthetics that reflected this consciously modern design was the Art Deco (Fig.1.2/1, Fig. 1.2/2).

Paris Métro was always considered the most elegant, particularly because of its Art Deco entrances designed by architect Hector Guimard (1867-1942), who was influenced by Art Nouveau architecture and developed his own style significant for fluid, curvilinear lines, called the “Style Guimard”, which was in opposition to ruling taste of French Neo-Classical architecture. His entrance gates of 1899-1905 were made of iron cast into elegant, flower-like forms with hooded light fittings and glazed canopies (Fig.1.2/3). Paris Metro had established its distinguished style using white tiles for the walls, white letters for station names on blue background, fixed size for advertisement panels and designed lamps, luminaries and other detail (Fig.2.1/4).

In Berlin, Swedish architect Alfred Grenander has designed between 1902 and 1930 more than seventy underground and elevated stations. His style evolved from decorative to modernist. Another
architect, Peter Behrens, designed the Moritzplatz Station. The buildings designed by well-known architects were perfectly functional from a technical and transportation points of view and at the same time featured architectural designs which in all their formal reductionism represented outstanding examples of so-called “Neues Bauen” (the new style of building). In design terms some of the stations have been very simple extended rectangles while others, for example Hermannplatz, had lofty halls with imposing stairways. The Alexanderplatz Station has been a model for the organization of a number crossing lines. The first part of the station was opened in 1913 along with an extension of today’s U2 line. In the 1920s Alexanderplatz itself was completely redesigned, both above and below ground. The U-Bahn station was expanded to provide access to the new D (today’s U8) and E (today’s U5) lines, then under construction. The result was a station with a restrained blue-grey tiled color-scheme and Berlin’s first underground shopping facilities, designed by Alfred Grenander (Fig.4.1/3).

Fig.1.2/1 Baker Street Station, Circle Line, 1865, London   Fig.1.2/2 Charing Cross Station, Bakerloo Line, London   Fig.1.2/3 Abbesses Station, 1900, Paris, arch. Hector Guimard

Fig.1.2/4 Pyramides Station, Line 7, Paris Fig.2/1 Canary Wharf Station, Jubilee Line Extension 1999, London, arch. Sir Norman Foster Fig.2/2 Bibliotheque Station, Line 14, 1998, Paris

In Japan, first subway stations were designed as utilitarian structures without much thought about appearance. Their distinctive features were station-front shopping districts - shōtengai, which developed around the railway tracks and also at the intersections of railways and subways, like for example, Nishiki Shōtengai in Kyoto.

2. AESTHETIC FACTORS OF SUBWAY STATION DESIGN

“Aesthetics of Railways” refers to aesthetics of railway stations and railway facilities. It includes station buildings, which are the entrance and departure points, as well as the circulation areas – concourses, railway tracks, platforms, and other functional spaces, containing retail, hotels, etc. It also refers to railway lines, station plazas and train cars.

“Aesthetics of Railways”, like aesthetics of other built forms, can be defined, as the balance between building architecture, engineering structure and transportation function in consideration of planning, layout, details and design context (Holgate 1992, Kido 1995, Kido 1997). Aesthetics requires that also other station functions need to be sensitively distributed and clearly distinguished from
those purely transportation. Aesthetic station has to be clear, easy approachable and easy to understand, but at the same time it needs to provide rich environment.

Aesthetic factors of station design include: space, light, color, scale, and details. There are also image-based elements related to design context, landmarks features, representation of the image of subways, as well as the representation of a brand of train operators and inclusion of artistic elements. Aesthetic factors are also related to distribution of commercial role of the station and treatment of advertisements.

- **Space** is an essential factor for a station because it must provide a room for many people using it every day. Station space serves to move through it, to wait, to purchase tickets, to prepare before embarking for a travel and after arriving at the destination. Appropriate and well-designed space provides security and well-being. Recently glass is often used in architecture. Glass elevators decrease the feeling of confinement, and as a part of universal design provide convenient access for physically challenged passengers. Transparency of glass creates station more spacious and understandable. Well-designed barrier-free space provides feelings of spaciousness, lightness, security and well-being.

- **Light** is also essential for a station to perform its function. At large stations, where the role of architecture and structure is paramount, the admission of daylight can increase the expression of structure which can even become a landmark. Daylight in daytime is preferable; therefore a provision of glazing increases the possibility of natural light’s penetration inside the station (Bibliotheque Station, 1998; Fig.2/2). Visual connection between platforms and concourses increases the amount of a daylight passed on the platforms. Admission of daylight through the sophisticated subway entrances highlights their architectural expression. It also improves the clarity of station layout because passengers can easily notice distinguished by light entrances and exits (e.g. Canary Wharf Station).

Artificial lighting is functional as well, and can increase visual expression of the station. Top lights create secure environment and enhance architectural features of the interior. Lighting has also informative function – properly lit signs, information posters, stations names, etc., enable passengers to move in right direction easily and safely. Successful lighting depends on combination of lighting levels and types of lighting fixtures. Design of lighting may create desirable atmosphere. Attractive luminaries applied at the Magenta Station (1999; Fig.2/3) in Paris, reduce the impression of underground enclosure and greatly enrich interior space. SNCF design was based on fundamental components: form and scale, structure, light, materials and colors. With most railway stations, the combination of architecture, light and space can be achieved but it is more difficult to realize
interesting reflection of light on architecture at the underground stations without daylight. At some stations, daylight has been deflected down by using glass walls or reflective shafts of translucent materials. Sometimes an opening in the ceiling or tunnel has been used to provide daylight coming down from higher levels.

- **Color** can be created by using colorful materials and colorful artificial lighting. Bright colors visually increase space; warm colors increase the feelings of safety. Colors are also used to express the design concept such as blue to create image of sea (Fig.2/4). Colors can be also used as a guiding or safety tool – for example by emphasizing railings or elevators by particular color. Colors combined with light can be used for aesthetic and functional arrangement at the station, to underline particular functional elements or show directions (Fig.2/5, Fig.2/6).

Fig.2/6 Iidabashi Station, Ōedo Line, 2000, arch. Makoto Watanabe  
Fig.2/7 Waterloo Station, JLE, 1999, London, arch. JLE Team  
Fig.2/8 Akihabara Station, Tsukuba Express, 2005, Tokyo

- **Scale** depends on the size of the station and on how many passengers use it. The scale of station building determinates also the meaning the station. In case of railways, large European railway terminals, like London’s St. Pancras or Paddington, were designed not only to provide adequate space for passengers but also to impress. Such stations like Gothic cathedrals had many meanings – political, social and urban. Smaller stations were designed more in relation to human scale. Large underground stations like in Moscow reflected the power of their builders. The light contributes to the perception of scale – even if the station is small, good lighting design can make station visually more spacious (Fig.2/7). Large scale of recent European stations is accompanied by human-scale elements. These stations respond to different objectives than in the past; they have been built with spacious spaces designated for various functions connected with a chain of a “seamless journey”.

- **Details** should be designed with particular purpose in mind – to provide direction, information, guidance, barrier-free access and to fulfill numerous other station functions. Such well coordinated and recognizable details should be integrated with the structure, space and light, and distinguished by colors and materials (Fig.2/8). Also, all the information and details should be readable for visually impaired people and understood by domestic and foreign travelers. The quality of design at such stations as Heron Quays on the Docklands Light Rail (DRL) has a big impact on well-being of passengers and their safety (Fig.2/5). The aesthetic design at the station helps also to control flow of passengers – by employing guiding lights at platforms and concourses. If elements like elevators are colorful and modern, they can be attractive as well (Fig.2/9). Thus aesthetic design based on the concept involving of elements, improves the efficiency of station – passengers can leave the platform more quickly and in more comfortable way, if they are provided with attractive and clear guiding information, escalators and elevators.

- Stations are perceived as **landmarks**, if their image-based elements are strongly related to their urban, historical, cultural, and social context and if they are harmonized with urban surrounding.
Image-based elements give the station the value of an urban landmark. Historically, main railway stations in Europe were distinguished by their large form and by a prominent location, since they were often facing the main street and had a plaza in front of the main entrance. Subway stations with impressive forms can be also conceived as urban gateways and landmarks through interesting frontages, entrances and open frontal spaces (Fig. 2/10).

- How the station represents rail companies is reflected in aesthetic design that contains a particular image of railways. **Image-based elements** include design expressing the image the subways or the image of train operators. Image of subways has been for example created through marking station entrances with original Hector Guimard’s Art Deco design at the Metropolitan entrances at Abbesses and at many other locations in Paris (Fig. 1.2/3). Also London’s Underground’s roundel is the most widely recognized transportation “brand”: LUL entrances have been always streetscape landmarks, along with double-deck buses (Fig. 2/11). The company logo, which is a part of a corporate design concept, has been redefined by many European operators. Similar metamorphosis has undergone in Japan the logo of Tokyo Metro. The company, after transforming itself in 2004 from the Teito Rapid Transit Authority – has changed former logo into a blue “M” sign, which has more direct association with company’s name and is easier to comprehend by Japanese and foreign passengers. New subway entrances emphasize the subway’s trademark sign (Fig. 2/12).

- **Public art** plays a significant role in enhancing image of railways. Railway companies understand the importance of introducing a design and culture into the stations. Art has become a part of cultural value of the rail brand design. It has been acknowledged that customers’ satisfaction increases with better designed stations, with comfortable waiting areas, with clear information signs, and additionally – with public artworks, cultural and community events and with other activities that can enrich the modern concept of the experience of travel. In Europe, some transport agencies have introduced a “percent for the art” policy, based on a fixed percentage (from 0.5% to about 1%) of all budgets for new developments allocated to the purposes of art. The issue of the art and design at
public transportation has been discussed for the first time at the International Union of Public Transport (Union Internationale des Transport Publics - UITP) Congress in 2001. At that congress John Meagher of Nexus, the Newcastle-upon-Tyne Metropolitan Transport Authority said, that the quality of the environment of public transport can be well reflected by its relationship with public art (Allen 2001). In Newcastle, the initiative of introducing public art in transportation came from the arts sector. In the effect of collaboration, the city developed a “percent for art” policy which gives up to 1% of their annual capital construction program on arts projects. In the course of the program which has been running for 26 years, at the beginning mostly permanent art works were installed at the stations but later more often temporary works such as lighting installations and live art events were installed and organized. Art works were also part of renovation projects of Paris Metro and London Underground. At Paris, RATP design applying arts has been described as “in favor sensitivity”, where the transportation network is a theater for the “scenarios” creating urban culture (Kaminagai 2001). Such cultural stages have been created at subway stations in form of “station–galleries”, such as Louvre-Rivoli in Paris (Fig.2/13) displaying an art from the Louvre Museum, and in form of “thematic stations”, such as Tuileries showing the theme of “Heritage” (Fig.2/14). There are also live artistic events and live music, which have already become part of Paris and London underground environment.

Public art can also serve practical purposes, such as helping passengers to identify the place where they are: e.g. the murals at the Victoria Station or at the Baker Street Station featuring Sherlock Holmes. In Europe, public art projects are often financed by government; for example the art program run in Brussels is financed by a government body set up in 1990 by the Public Works Ministry and it is related to artworks at all transit facilities.

Art has been also applied at Japanese stations – e.g. wall sculptures at TMG Ōedo Line, Tokyo Metro and Minato Mirai Line. At Kinshicho Station (2003; Fig.2/15), murals featuring replica of famous ukiyō-e have been installed in front of automatic gate. Exposition of public art in Japan has been supported by municipality and private organizations – for example Tokyo Metro received 100% subsidies for public art. The art has been installed at Ginza Station’s space for entertainment events. TM received also donations from Japanese and American artists for an “art station” at the Tameike-Sannō on the Ginza Line (1997, Fig.2/16). At the Tameike-Sannō on the Namboku Line (2000) there are artworks on the walls behind the safety doors. At some stations, such as Kiyosumi-Shirakawa on Hanzōmon Line, art has been accommodated into station walls at the platform level. At the Bashamichi Station on the Minato Mirai Line (2004, Fig.2/17), artistic mural by Junpei Nakamura from old building of the Bank of Yokohama has been exposed as a one of the works of art.

- Distribution of commercial function at the stations and clear arrangement of station space in regard to its function is the factor of relation between form and function. Along with the process of evolution of railway stations, more functions have been added, such as retail, hotels, restaurants, leisure, etc. Ross (2000) has listed forms of retails that include: small shops, small size walk-in units, kiosks often located at the platforms, trade stands, vending machines, public telephones, auto-teller machines (ATMs), promotional activities and internet facilities. Intermodal stations became interchanges providing access for air, other rails, bus, underground and LRT services, and a part of a new urban and commercial center accommodating businesses, hotels, and shopping centers. Shopping malls and convenience stores have been often installed around stations concourses. Stations including subways have become transportation nodes offering many attractions and experiences as a part of efforts of changing railway companies trying to improve their products to reflect their corporate prestige. The development of many functions at railway and subway stations caused problems with their proper arrangement. In Japan, more functions has led to confusion at some stations, where the
priority was put on commercial facilities over rail travel activities. Retail is important but secondary function at the railway stations. It attracts passengers and makes station multifunctional but it also needs to be properly distributed to prevent the station to become a “department store” or a maze through which passengers can not easy find their ways. The problem of separation of transportation and commercial function and at the same time making commercial facilities easily available is very difficult, particularly at historical stations, which need to be modernized to nowadays standards.

Fig.2/15 Kinshichō Station, Tokyo Metro Hanzōmon Line, 2003  Fig.2/16 Tameike-Sannō Station, Tokyo Metro Ginza Line, 1997  Fig.2/17 Bashamichi Station, Minato Mirai Line, 2004, Yokohama

Commercial developments can be designed as “concentrated shopping malls” integrated with public areas of the station and distinguished from other services for passengers or as “lines of shops” usually developed in the form of corridors of retail surrounding the main operation areas. If a separate mall approach is impossible, shops line in the areas bordering the platforms. In Japan at large stations, retail is often located in the main operational areas (e.g. Ikebukuro Station) filling the station spaces as much as possible. The piecemeal approach is incoherent, resulting in adverse affect of commercialization of stations. These adverse effects of retail that may occur at any ill-conceived stations include clutter and congestion, clashing with architectural style and interior design, and obstruction in passenger operation. When installed at the main concourse, the retail has to be balanced and include many kinds of services, such as small shops and restaurants. A new approach is to design separate commercial facilities with easy access from subway stations. The newest commercial facility by Tokyo Metro - “Esola Ikebukuro” (2009) – is a 10-storey (with basement) building, featuring restaurants, cafes and various shops. The concept is to connect subway users from the underground with the space under the sky.

- Treatment of advertisement reflects approach to aesthetics in public spaces. Currently a wide range of advertising media is available, such as different kinds of posters – traditional, illuminated, back-lit posters in illuminated casing which are often applied at the subway platforms, moving displays, TV and plasma displays, messages at the stair cases and along escalators, on the train bodies, inside the trains, branding the entire stations to one advertiser, various sales and campaigns installations.

The advertisement can be a part of aesthetic design, if it is a part of the design concept. In such design, it is important to maintain the balance between the size of the station and the amount and sizes of advertisements. At Paris Metro, advertisements are incorporated into design of the station walls at the platforms (Fig.2/18). Advertisements should be associated, if possible, with the context of the station environment, may have a reference to healthy lifestyle products, culture, etc. – to enhance the value of the station image (e.g. Embankment Station, Fig.2/19). Particularly sensitively should be handled the advertisements at historical stations, where they should be well integrated with station architecture.
In Japan the trend to place many advertisements is stronger than in Europe. It is maybe because the recognition of aesthetics of public facilities has been weak here since the post-war economic development, followed by the destruction of landscape since 1970s, when stations displayed lack of architecture, and “despite their public character, station buildings are literally covered with so much commercial advertising that it is often difficult to tell whether they are station facilities or commercial buildings” (Ashihara 1998). Railway stations have been often virtually covered by advertisements. Even modernized elevation of Shibuya Station, designed by arch. Kengo Kuma (2003), is always being covered with advertisements (Fig.2/20).

3. RENOVATED AND NEW SUBWAY STATIONS IN JAPAN

3.1 REVITALIZING OF TOKYO METRO STATIONS

Tokyo Metro has been operating nine lines: Ginza, Marunouchi, Hibiya, Tōzai, Chiyoda, Yūrakuchō, Hanzōmon, Namboku and a new line completed in 2008 - Fukutoshin. Tokyo Metro has 203.4 km, 168 stations and average number of passengers is 5.59 million per day. Currently, together with four lines of the Transportation Bureau of the Tokyo Metropolitan Government (TBTMG) there is a network in the capital consisting of thirteen subway lines. Through services with private railways started in 1962 with the Tōbu-Iseaki Line and expanded with many other lines.

Tokyo Metro has been completely renovating its stations after 40 years in use. Partial renovations are carried out more often. Some stations have been refurbished as “thematic stations” – e.g. Kōrakuen Station on Marunouchi Line (Fig.3.1/1) and Myōgadani. Toilets have been improved at many stations and installed facilities for physically challenged persons, including elevators (Fig.3.1/2). In April 2004, two pilot stations at Ginza and Otemachi have been furnished with new information designs based on two colors – yellow and blue (Fig.3.1/3, Fig.3.1/4). Now these new signs and new information boards are also at other stations. Also, to improve information, each station on each line in Tokyo network received a number, for example “G 09” is a Ginza Station on Ginza Line. Safety has been improving through the installation platform doors not only at the new stations (Fig.3.1/5) but also at the stations previously without guarding doors, e.g. on the Marunouchi Line. Although function and engineering soundness seem to be the priorities of station design at the Tokyo Metro, there is also attention put on aesthetic design. Four stations have been chosen as “Top 100 stations in Kantō Area: Asakusa Station on Ginza Line, Tameike-Sannō Station on the Ginza (Fig.2/16) and Namboku Lines (Fig.3.1/4), Kōrakuen Station on Marunouchi (Fig.3.1/2 and Namboku Lines and Ginza Station on the Ginza, Marunouchi (Fig.3.1/3) and Hibiya Lines.

Tokyo Metro has been expanding its non-operational businesses, such as retailing and station building. As a part of revitalization, new retailing spaces have been arranged at the stations. “Metropia” convenience stores have been installed at the stations since 1988. Small kiosks “Metro’s”Coffee shops
and other small shops have been also installed at many platforms and concourses (Fig.3.1/2). Commercial business on the larger scale is developing at the station buildings, which are designed to attract people. Among newest ones are: “Shibuya Mark City” (2000) at Shibuya Station, “M’av Myōden” (2000) at the Myōden Station on Tōzai Line, and “M’av Ayase Lieta” (2002) at Ayase Station. “Shibuya Mark City” consists of east and a west high-rise building located next to JR Shibuya Station and contains a wide range of stores and restaurants, the Shibuya Excel Hotel Tokyū, office space, a bus terminal and the terminal station of the Keiō-Inokashira Line. Another form of getting customers is design of attractive underground shopping malls. In 2005, a new shopping mall was opened at Omotesandō Station – “Marche de Metro”, with 26 shops and total floor space of about 1,300 m², as a part of new Echika complex (Fig.3.1/6). Design details, such as white tiles and French shops resemble Paris Métro; symbolic columns had a map of Paris Métro. Along with commercial developments, Omotesandō Station was refurbished in 2006: the surface of the platforms, walls and columns was renovated and made more attractive, new furniture was installed (Fig.3.1/7). Following the success of Omotesandō, another - Echika Ikebukuro was opened in 2009 (Fig.3.1/8). These places have been designed as a quality spaces with high quality foods and designed products.

Revitalization efforts include also development and renewal of underground corridors, which have been renovated and widened at many places, for example at the Mitsukoshi-mae Station, in collaboration with Mitsukoshi department store (Fig.3.1/9), and at the Shinjuku sann-chōme Station, in
collaboration with Isetan department store. Underground corridors have been made wider and more
elegant, reflecting upscale fashion character of the stores. Also concourses near new urban
development such as Tokyo Midtown (2007) have been also extended and designed with a good sense of
style harmonized with architecture (Fig.3.1/10).

Although there have been many efforts to improve existing stations, there are still matters that
should be improved, for example arrangement of the walls (Fig.3.1/11), sizes of advertising panels
along the platforms, and better design of various details.

In Tokyo, there are many subway entrances to each station. Very often the entrances lead
through an office or commercial buildings or through a separate staircases with canopies that are
located on the sidewalks. Most of such entrances are typical. Only several entrances in Tokyo have
original design in form of a separate building or a glass canopy (Fig.3.1/12). Also only a handful of
entrances have a plaza in front of them. New trends in design have been reflected also at the subway
entrances, among which some have undergone complete makeover. At the Omotesandō, entrances have
been designed in glass, reflecting trends in modern architecture (Fig.2/12).

![Fig.3.1/10 Corridor between Roppongi Station and Tokyo Midtown (2007)](image)
![Fig. 3.1/11Mitsukoshi-mae Staion, Ginza Line](image)
![Fig.3.1/12 Yūrakuchō Station entrance, 1996, Tokyo, arch. Rafael Vinoly](image)

### 3.2 NEW STATIONS OF TOKYO METRO

While many older stations are lacking aesthetic concept, better and nicer stations are on
relatively newer lines or their extensions, such as Namboku (2000) or Hanzōmon (2003). Completely
new Tokyo Metro stations are on the Fukutoshin Line (2008).


  On Namboku Line, Komagome–Akabane–Iwabuchi section was opened in 1991 with platform
doors at all stations. In 2000 was completed the Meguro – Tameiko–Sannō section and the connection
from Meguro to Akabane–Iwabuchi. In the same year began reciprocal service with Tōkū Meguro Line
(to Musashi-Kosugi). In 2001 started a reciprocal through-service on the north, with Saitama Kōsoku
Line to Urawa–Misono Station. Namboku Line no.7 was designed according to the concept of “high
quality, amenity and totality”. Automatic doors have been adopted at the platform. The doors are
painted in each station in different color – the theme color according to station design concept
(Fig.3.2/1, Fig.3.1/4). Each platform design was intended to express station identity through the use of
motifs on the walls, combination of colors with one dominating “station color” (six colors have been
applied in sequence), design motif at the “media wall”, and the "art wall". For example red color was
selected for Azabu–Jūban Station and therefore doors and benches have been designed in red
(Fig.3.2/1). The pictures on the walls have been designed as the art gallery with different motifs at
different stations (Fig.3.1/4). Such “art walls” were sponsored by various companies, for example wall
with “Sport” motif was sponsored by JT and Nikkei Shimbun. Each station has a basic concept: an
architect Kengo Kuma was consulted in regard to architectural design. Other concepts for attractive
new stations at include media walls – panels indicating local characteristics, symbolic columns at the
entrances and lights (Fig.3.2/2), “fureai corners” – featuring art and symbolic elements. The designers attempted to achieve a total design by a combination of station color with signs and graphic design, through coordination with product design (doors, arrangement of ticket vending machines and ceiling above the entrance), with furniture design, and with station environment. Some sense of design has been achieved but rather through the decoration and finishes and not through the total engineering design.

- **Hanzōmon Line (2003)**
  On Hanzōmon Line, new stations were opened in 2003 on the section from Suitengumae to Ohashi, providing direct connection between Shibuya and Ohashi. On the other end Hanzōmon Line, the through services have been provided since 1978 with Tōkyū–Shin-Tamagawa Line to Futako-Tamagawa and extended to Chūō-Rinkan via Tōkyū-Den'en-Toshi Line. Stations on Den'en-Toshi Line have been modernized: some have been newly constructed underground, such as Meguro and Den'en-Toshi stations. In 2003 started reciprocal through-service with the Tōbu-Iseizaki and Nikkō Lines (to Minami-Kuribashi). One of the stations, Kinshichō, has been located on the stretch of line completed in 2003. The walls at the station platforms (Fig.3.2/3) and in front of the automatic entrance gates (kaisatsu-guchi) have the panels with Japanese traditional wood-block prints (ukiyo-e). Stations on this line also show design rather on the surface, than a symbiotic architectural-engineering design.

- **Fukutoshin Line (2008)**
  The newest line of the Tokyo subway network, was opened in stages between 1994 and 2008. It consists of an older 3.2 km segment from Kotake-Mukaihara to Ikebukuro, running parallel to the Yūrakuchō Line on separate tracks that began operation in 1994. This segment was initially known as the Yūrakuchō New Line. The newest segment connecting Shinjuku and Shibuya via Ōsishigaya, Sendagaya and Meiji-jingū-mae, opened for service in 2008, officially completing the Fukutoshin Line. Service to the Senkawa and Kanamechō stations, which had been bypassed by the Yūrakuchō New Line, also has also started. The entire Fukutoshin Line runs 20.2 km between Shibuya and Wako in Saitama Prefecture. Through services to Kawagoe-shi station on the Tōbu Tōjō Line and Hannō station on the Seibu Ikebukuro Line are offered.

  Design of each of eight new stations – Ikebukuro, Ōsishigaya, Nishi-Waseda, Higashi-Shinjuku, Shinjuku San-chōme, Kita-Sandō, Meiji-jingū-mae and Shibuya on the newest line - has been by no means also economically-oriented, but aesthetic considerations have been taken into account as well. The space has been restricted for a new line in the center of congested Tokyo but still some larger spaces at the concourses and higher ceilings above the escalator have been constructed. At some stations, like for example Meiji Jingū-mae, larger space have been achieved through the rising of the height at some points at the platform (Fig.3.2/4). Shibuya Station has also been creating a buzz when it comes to design. The station is actually operated by Tokyu Co. and called Tokyu Toyoko Line–Tokyo
Metro Fukutoshin Line Shibuya Station. Part of the new Shibuya Station is designed by renowned architect Tadao Ando with an oval-shaped "underground spaceship" that lies beneath the site of the now-razed Tokyu Bunka Kaikan building (Fig.3.2/5). The oval space stretches 80 meters and is about 24 meters wide. The middle is an open oval space between the third to fifth underground levels. The escalator has also original design – the ceiling has been raised and shaped in waves to make passengers descending to the trains less confined (Fig.3.2/6). The station is part of Tokyu's development plan for the surrounding area. Shibuya is the world's first large underground station to have natural ventilation. The sides of the oval walls are vaulted and let air flow in and out from the outside. The station also features cooling tubes containing water that run along the ceiling and under the floor. Aside from saving energy, the station is innovative in sense of architectural design. New technological features blend with architecture giving the station sophisticated modern image.

Other features on Fukutoshin stations design are color coordination for each station, design theme and art walls installed near the automatic gates, and transparent modern platform furniture. Modern stations have been constructed on the Minato Mirai Line in Yokohama but in Tokyo so far, Shibuya is the most modern looking subway station that can be compared with European and American stations.

4. RENOVATED AND NEW SUBWAY STATIONS IN EUROPE
4.1 REVITALIZING OF EUROPEAN METRO STATIONS

Along with railway stations, which required renewal of worn-out facilities and upgrading, also European subway networks, which have been more than one hundred years old, were in a need for modernization and refurbishment. London Underground and Paris Métro had reputation for design excellence and recent past have seen renaissance of station architecture on its new stations and renovation of old ones. Berlin's U-Bahn has been more restrained in design but distinguished by features derived directly from its structure, such of 1920s iron work of columns and beams.

Renewal of subway stations focused on enhancement of cultural values and on brand design of particular subway operators. Design features tended to link stations with local communities through
collaboration with local residents, promotion of cultural activities - organizing various events, concerts and through design competitions, and linking current stations with rich historical heritage. For example, London Bridge Station, which was first opened in 1836, has been renovated (Fig.4.1/1). New design features old brick vaults, interesting lights, partitions made of glass, clear and aesthetic information signs and nice public spaces and shops. In London, starting with Hillingdon and Hammersmith, rebuilding of which were completed in 1994, the renewal found its extraordinary means of expression in the new stations built on the Jubilee Line Extension at the end of 1990s.

London and Paris subway design has been harmonized through the network by maintaining consistent design rules in general (e.g. position of fittings, schedules, size of advertising panels, etc.) since long time ago. As a part of revitalizations, the designed code has been maintained and developed, with individual design for particular stations. For example, the main public transport operator in Paris RATP (*Régie Autonome des Transports Parisiens*) has introduced thematic stations with design featuring particular themes (e.g. Europe, Sport, Pasteur, etc.). For example, at the Europe Station – the theme “Europe” has been reflected in display of daily life in the EU countries – in video images, posters and sound and colorscape (Fig.4.1/2). Another type of the stations included “stations-galleries”, which display the art from famous museums, such as Louvre-Rivoli Station with the exposition from the Louvre Museum (Fig.2/13).

In Berlin, historical stations have got renovated after unification and adjustment of subway system in Berlin (Fig.4.1/3; Fig.4.1/4). Structural elements have been painted in various colors, old furniture revalorized but in some cases architectural elements have been lost due to negligence or lack of respect. One of renovated stations has been Alexanderplatz Station (Fig.4.1/3). Historical blue-grey tiles have been maintained, and station with painted structural elements in red has received a new fresh look.

### 4.2 NEW EUROPEAN SUBWAY STATIONS

Subway networks in big European cities have been still developing because very often some parts of cities - “transport islands” - were not connected well with city centers. In Paris subways have been developing outward to connect more distant locations with the city center. In London the Jubilee Line Extension was connected with the development of waterfront at the Docklands. In Berlin after unifications, the urban development has been parallel with the transportation development, including new railway stations and subway stations on new lines.

- **Jubilee Line Extension (1991)**

  London’s Underground has been very progressive since first “Tube” line opened in 1863 but still some parts of London (e.g. south London and East End) were not linked well. The need for subway extension was particularly visible in late 1980s and 1990s, after the redevelopment projects changed neglected dockland areas in London into sophisticated business and residential centers. The development of Canary Wharf stimulated eastward extension of existing (completed in 1977) Jubilee Line, linking Charing Cross with Stanmore in the northwest suburbs. The project included renovation of six stations, maintenance depot and a control center and construction of five new stations on the Jubilee Line Extension (JLE) in 1999. The new extension with the total length of 12.2 km begins at Green Park Station and runs out to Stratford in the east. Italian architect Roland Paleotti who was commissioned for the JLE project, assigned well-known architects for the design of each nine stations with two stations handled by his own JLE design team. Newly designed stations included: Westminster (arch. Sir Michael Hopkins), Waterloo (arch. JLE Team), Southwark (arch. MacCormac Jamieson Prichard), London Bridge (arch. Weston Williamson), Bermondsey (arch. Ian Ritchie; Fig.),
Canada Water (arch. JLE Team), Canary Wharf (arch. Sir Norman Foster), North Greenwich (arch. Alsop, Lyall and Stomer), Canning Town (arch. John McAslan), West Ham (arch. Van Heyningen & Haward), and Stratford (arch. Chris Wilkinson). As a result, each station displays high architectural and structural qualities.

The common feature of station on JLE is elegance reflecting tradition of London’s subway design led in the 1930s by Charles Holden, and nowadays high technology. Even though each station designed by different architect is different, all of them have large interior spaces, concrete finish, metal details, and original lighting. Each space is defined and the need for signs is reduced to minimum. Total design considers stations from their entrances at the ground level, through the large escalators grouped in sets of at least three, and concourses down to the deep platform level (Fig.4.2/1; Fig.4.2/2). The project achieved the symbiosis of architecture and engineering – with daylight used as a structuring and directional device. The design priorities were to provide generous and easily to understand space, clear passenger routing, comfortable access by escalators and elevator.

![Fig.4.1/3 Alexanderplatz Station, 2007, Berlin](image1)  ![Fig.4.1/4 Zinnowitzer Station, Berlin](image2)  ![Fig.4.2/1 Canary Wharf Station, 1991, London, arch. Sir Norman Foster](image3)

![Fig.4.2/2 Canary Wharf Station](image4)  ![Fig.4.2/3 Biblioteque-François-Mitterrand Station, 1998, Paris](image5)  ![Fig.4.2/4 Berlin Hauptbahnhof, 2009, Berlin](image6)

**Line 14 in Paris (2003)**

Similarly, in Paris there was a need to connect East Paris with West Paris by a subway. New subway line – Line 14 (M 14) completed in 1998 crosses the center of Paris and runs from Madeleine to St-Lazare (extended in 2003) and in opposite direction to Biblioteque François Mitterrand via Pyramides, Châtelet, Gare de Lyon, Bercy and Cour St-Émilion. The line called “Météor” (acronym of *Métro Est-Quest Rapide*) was the first automated line of Paris Métro. Météor Line 14 (M14) was designed in a unique fashion, with elegant and modern materials and landing doors on the platforms preventing passengers falling onto tracks (Fig.4.2/3). Regarding its architecture, the stations are brightly lit, spacious and uplifting. Instead of circulation paths, like at old Métro stations, there are mezzanines from which people can look down on the platform before descending to them. The Météor Line is unique in that its stations are not merely decorated spaces but rather they present a holistic architecture of great visual quality.

**Berlin Line U5 (2009)**

In Berlin station design ranges from 1960s Minimalist style and colorful 1970s Pop Art design to
Postmodernism. In Post-Modern style has been designed Rathaus Spandau Station (1984) by architect Rainer G. Rümmler. In 2009, Berlin’s U-Bahn opened its newest segment of subway, a 1.4 km three-station line connecting the main rail station Berlin Hauptbahnhof to the Brandenburger Tor (Brandenburg Gate). It’s temporarily called the U55, but it will ultimately become part of the expanded U5. From the Gate, the line will continue east under Unter den Linden, Berlin’s main processional boulevard, to Alexanderplatz, the former East Berlin downtown and one of Berlin’s most important hubs. Berlin Hauptbahnhof is a spacious station with white walls and historical pictures on the walls showing Berlin famous stations (Fig.4.2/4; Fig.4.2/5). Another station, Brandenburger Tor, has been designed also as a “station-gallery” with a series of lighted panels describing the whole history of the gate from the time of Napoleon (Fig.4.2/6). While descending from the platform, one is greeted with a series of quotations from historical events surrounding the Berlin Wall (Fig.4.2/7).

Fig.4.2/5 Berlin Hauptbahnhof  Fig.4.2/6 Brandenburger Tor Station, 2009, Berlin  Fig.4.2/7 Brandenburger Tor Station

5. CONCLUSION

Rapid transit stations in Japan have shorter history than stations in Europe. Although relatively young, in last 80 years subway networks in Japan have been developed extensively. Comparing with Europe, in Japan first subway stations had less aesthetic appeal. In Europe there has been a long tradition of architects’ involvement in station design. In Japan subway companies have been developing their in-house designs.

Currently both in Japan and in Europe, the implementation of aesthetics is being realized by railway companies - through their policies, amenity improvement programs, by focus on their corporate design, by involvement of architects (particularly in Europe), and appointment of design committees (in Japan). Japanese stations are distinguished by their cleanliness, accessibility, good toilets, bilingual information signs and safety. However, comparing with European, Japanese stations are less spacious and there is less space for waiting. Aesthetic design has been often realized mainly as a decoration. At key places there are designed spaces with special lights, works of art, etc. At the Ōedo Line, a care has been taken to make stations visually interesting but there is not a total design consistent from the station entrance to the platform. However the Ōedo Line project have been seen as a milestone linking the concepts of design with large-scale government development projects.

In Europe, aesthetic design has been more comprehensive and totally applied, starting from the arrangement of the space and structure and ending on the finishes, furniture, materials and colors. For example, stations on the Jubilee Line Extension display a cutting-edge design which is characterized by the symbiosis of architecture and engineering – that is difficult to achieve in Japan. In Europe stations are often designed by well-known architects. Collaboration between architects and structural engineers has been very successful, resulting in splendid new stations, which beauty relies on innovative structures and well-designed details. Canary Wharf Station is a model station showing the unity of architecture and engineering at its best. Shibuya Station has only one “moment” of
architectural beauty – an opening in the ceiling at the end of the platform and otherwise it is very typical and functionally-oriented station. In London, daylight and artificial lighting are used as structuring and directional devices. The design priorities are to provide generous and easily to understand space, clear passenger routing, comfortable access by escalators and elevator. In Japan, the access by escalators and elevators has been greatly improved but the routes are often complicated and sizes less generous.

There is a trend in Japan to improve aesthetic design and overall there have been a lot of achievements in station renewal and design of new stations. The newest Fukutoshin Line in Tokyo shows that Tokyo Metro has aesthetic concern but the resources are limited. Subways in metropolitan area are facing also strong constrains due to lack of space and large number of users. New designs show that the designers try to increase the station space but due to limitations, it has been achieved only at some designed places.

In Japan railway companies are responsible for design while in Europe design process is different and there is a stronger influence of government, local communities and public. One of attempts of private company to relate to public is Tokyo Metro’s "Power to make Tokyo run" – idea of a group involved in station design and producing together a station design guideline. The realization of aesthetics in transportation is more likely to advance in the case of public operators owned by the municipality, when railway authorities and urban planners work together on planning and design of railways; such is the case of RATP – public operator of subways, buses and LRT in Paris.

The aesthetics of subway stations in Japan and Europe in future depends on philosophy of railway corporations, on their attitude towards how to achieve a proper balance between aesthetics and cost, and above all – on the spreading of popular perception of railways as public realm - that should provide public with amenities and rich environment. The future belongs also to more active than before involvement of public in planning and design process.

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