

AESTHETIC ASPECTS OF RAILWAY STATIONS IN JAPAN AND EUROPE, AS A PART OF “CONTEXT SENSITIVE DESIGN FOR RAILWAYS”

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Abstract: Railway stations are viewed, as a part of Railway Landscape (RL) – a railway infrastructure considered in terms of visual amenity and functional efficiency. Perception of RL and its deterioration in Japan are discussed, with focus on railway stations that became to uniform and rationalized, with too many commercial advertisements, and their comparison with European ones. The purpose of the comparison is to identify problems of Japanese stations, and find out what lies behind a successful design of many European ones. The paper describes the objectives of “Station Renaissance” - a rediscovering railways trend that was initiated by railway operators in Europe - and indicates different approaches in Europe and Japan. “Context Sensitive Design” (CSD) is introduced, as a new comprehensive method of transportation planning and design, which among other considerations includes aesthetics of transportation infrastructure. It is suggested, that while CSD in USA and much the same concepts in Europe generally refer to planning and design of highways, similar concept – “Context Sensitive Design for Railways” (CSDR) - can be applied for railways. The paper concludes that CSDR approach can successfully improve aesthetics of Japanese stations.

Key Words: Aesthetics, Railway Landscape, Railway Station, Context Sensitive Design

1. INTRODUCTION

Since 1980s in Europe and 1990s in Japan, railways have been at the stage of recuperating their previous glory, particularly due to the development of high-speed trains, greatly improving travel by train. Sophisticated trains required modern stations, thus originating new trends in station design. “Station Renaissance”, promoted by railway operators to enliven railways, included wide range of activities and policies related not only to new railway lines and stations, but also to station refurbishments and to introduction of new images of railway travel, station and rail operators. In Europe, new railways have focused considerably on customers’ expectations, particularly in regard to aesthetic and functional station spaces. In Japan “Station Renaissance” has produced some splendid stations, however majority of stations, particularly at large metropolitan areas are still problematic and need to be improved. The purpose of the comparison between the Japanese and European stations is to indicate the problems of Japanese stations, the qualities of European ones, to examine the context of successful European design, and to determine which approaches can be also relevant for Japan. While in Europe sensitive station planning and design have been often complied with participation of urban authorities, private developers and local communities - in Japan central government has had a long tradition of solely decision making and public participation has been largely limited. In late 1990s in USA emerged a new trend in transportation planning and

design, known as the “Context Sensitive Design” (CSD). Among various objectives of the CSD are aesthetics of transport facilities and environmentally sensitive design, realized through the efforts to increase understanding of environmental and aesthetic issues within the engineering community, and to enforce practical involvement of local residents. In such way, the CSD seems to be a universal tool for all kinds of public transport, including railways.

2. RAILWAY LANDSCAPE AND AESTHETICS OF RAILWAYS

2.1 Railway Landscape

Transportation infrastructure is one of the most dominating elements in the cities and in the open landscape, which has the power to redefine an urbanscape and a natural surrounding. In the city railways are part of so called “planned landscape”, which is based on the set of cultural patterns and developed through planning (Rackham 1986). Railway Landscape (RL) is a landscape filled with rail infrastructure that is perceived in the context of visual amenity and functional efficiency. RL consists of three-dimensional network of railways, subways, and LRT, which contains three basic elements of rail infrastructure – railroads, stations and train cars. In the course of history and along with technological development, town and city layouts, in which transportation facilities have played important role as communication corridors, underwent various changes. Bell (1999) observed that eco-systems and human patterns, as well as the processes of landscape, have been disturbed not only naturally but also that landscape has been diverted by a human planning – which has especially affected the beauty of natural landscapes. Elevated railroads have had particularly negative impact but it could be mitigated through the adjustment of their design, layout and alignment. The influence can be also positive, as in the case of LRT tracks, which can make streetscape even more attractive.

Railway stations are important public buildings, which besides giving an access to trains, perform a variety of functions – of meeting places, shopping centers and very often – of urban landmarks. How the station affects the landscape depends on its functional type. In theory there are several types, such as suburban station, city center terminal, interchange, small station, airport station, and LRT station but as some writers note (Edwards 1997), currently the station has become more complex and fulfills more than one functional role. Complexity of contemporary stations is reflected in their spatial conception, which is a combination of a building with a train shed or canopies, concourses, and an outdoor environment. Obviously for a station the transportation function is the most essential one. Although the function of a building is mainly transportation, in Japan station spaces designed for passenger transit have been transformed into multifunctional spaces serving a variety of purposes (Tsuchihashi 2003). They have a tradition of multiple functions and even some writers observed that combination of various functions at the station was a unique feature, not to be found in other countries (Takeyama 1997). Recently also European stations have acquired this multifunctional image; they do not only provide links with other modes but also serve as commercial centers.

2.2 Perception of Landscape

To understand visual impact of railways it is necessary to clarify what affects the perception – that of nature and of built form. Response to nature varies from country to country and particularly in Japan many people believe in their unique way of perception. Some authors (Shinohara 1887, Ashihara 1983) see climate, topography, natural phenomena, and vegetation, as playing fundamental roles in determining Japanese view of nature. Perception is however a

part of complex aesthetic experience that is profoundly attached to the history and culture. Japanese appreciation of nature has been affected by natural phenomena, such as rainfall, strong wind, seasonal changes in colors, etc. (Shinohara 1987). Traditionally, it was reflected in extraction of natural phenomena as key landscapes, in stylization of a landscape experience (*hakkei*), in selection of scenic spots (*meisho*), and in contemplation of a landscape in terms of transience and ephemerality. However by the middle Edo period (1603-1867), landscape perception was somehow liberated from the convention of *meisho* towards observation of a broader environment. Real-world perception became the foundation of a new aesthetics associated with new technologies, among which railways became the subject of national fascination and pride – and it was with these new technologies that *meisho* of modern Japan became associated (Traganou 2004). Aesthetical preferences in traditional architecture and gardens favored asymmetry, arrangement of parts, and contents more than context (Ashihara 1998, Shelton 1999). Built forms were planned sensitively and additionally incorporated surrounding scenery into their gardens, through a technique known as a “borrowed landscape” (*shakkei*). While traditional architecture depended on nature, contemporary one has such relation weaker. Modern landscape has been completely changed and in many cases altered into commercial product rather than sustained as cultural landscape (*fukei*). Ancient Western philosophies also embodied appreciation of nature. Although originally the human’s attitude towards nature was either submissive like in Japan or reverential, gradually gaining technological power, human sought control over the nature. Today environmental concern is not confined to the natural world but it also includes built environment - physical structures, cities with all social, intellectual, and cultural interactions. In Western world there has always been a greater emphasis on form and context than on contents, and stronger appreciation of unchanged natural landscape and of long-lasting solid structures. Today Japanese aesthetics still reflects more temporary values than permanent, flexible than fixed, decentralized than centralized, shifting and “cloud-like” order than fixed and “clock-like”, content - against physical context, and vague - as opposed to clear boundaries between an object and its surrounding (Maki 1988). These qualities are reflected in Japanese cities and architecture, and that legacy plays also important role in aesthetics of Japanese stations.

As it was said, railways have a tremendous visual impact on the landscape. In general, perception of railway landscape can be categorized, as static and transitional. Some authors (Carpenter 1994) distinguish ways, in which railways can give a visual pleasure or displeasure. These ways include reactions, which arise from the sight of trains, obstruction of views by railway structures, clash or blend of railway structures and trains in the landscape, and attractiveness or lack of attractiveness of the view from the train. While first three categories apply for the static landscape, the fourth is related to a transitional one. Elements of static landscape include infrastructure perceived by standing or walking people: railroads (structures, tracks, line side accessories, and earthwork), railway stations (buildings and structures), and trains. Lack of visual intrusion is important in perception of such landscape. It is particularly significant in case of scenic landscapes because scenic views have always been an attraction of railway journeys. Landscape is transitional, when it is viewed from a moving train. Such spectacle is defined by speed, restriction of vehicle, and distant interaction with the landscape that is perceived in transit. High-speed affects the experience because it distorts perception of details. As Motloch (2001) pointed out, “*spatial perception decreases with speed, as does our understanding of the landscape*”. “Moving landscape” seen from a conventional train consists more of separate pictures. Because passengers more likely would watch the outside scenery - lack of visual obstructions, such as cables and billboards is desirable. “Moving landscape” seen from a high-speed train is flowing like a movie. In such case the passengers would likely focus on the inside of the train car, which gives an importance to interior design. The role of

designers is to avoid visual intrusions, and while preserving views that give the most pleasure, to mitigate the negative impact of railways on people and resources. It can be achieved through alignment of the routes, transparent barriers, appropriate design of structures and architecture, planting of vegetation, and landscaping.

2.3 Aesthetics of Railways

In general, aesthetics means beautiful and showing refined taste objects. Aesthetic qualities of built forms depend upon their design and are examined through a perception. The concept of aesthetics is a broad one - not only limited to purely visual qualities based on well-established principles of formal analysis, such as size, shape, texture, color, etc. - but it also includes more subjective aspects, such as utility, intentions of designer, visual and mental impressions, context, invention of structural forms, sense of place, etc. (Holgate 1992). Aesthetics depends on the relation between form, function and beauty. These relations have been changing in time along with architectural styles. For engineers, function was always important because their structures always had an explicit function. Railroad station was invented for travel and it always had to fulfill a number of purposes, including its main transportation function. Station design was a completely new task for 19th century engineers, because they had to find for it a new architectural form: *“There was no functional precedent for the [first] depot; every solution had to be invented. The station was an essential part of the system of transportation; it reflected the impact of the technology and mobility of the masses”* (Meeks 1995). In the past, the European and American train depots reflected qualities of architectural styles, later became more standardized until recent revival, when station buildings have again become structurally, formally and functionally innovative.

Aesthetics of railways can be defined as a balance between exterior and interior of station, between building architecture, engineering structure and transportation function - in consideration of its planning, layout, details and context. 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 a rich environment. Aesthetic factors of station design include: space (provides security and well-feeling); light (preferably daylight and top light - create secure environment, enhance architectural features); scale (preferably large spaces with human-scale elements); and details. Among image-based elements related to design context are: local landmark; image of railway or subway (e.g. marking station entrances, such as the Art Deco entrances at Paris Metro); and image of a train operator (reflected in signs, colors, heritage, public art). Currently the implementation of aesthetics is being realized by railway companies - through their policies, including amenity improvement programs, new concept of corporate design, and modern architectural design achieved through involvement of well-known architects. Aesthetics and economy have been often seen, as contradicting each other. Since the separation of architectural and engineering professions, some engineers thought that satisfying of aesthetic requirements involves additional cost. However there are many examples of structures and buildings being beautiful and economical at the same time.

3. PROBLEMS OF JAPANESE STATIONS AND THEIR REASONS

Despite recent positive examples, railways in Japan display variety of problems, such as:

- Elevated railroads are obstructive in natural and urban environment.
- Stations, which are not only transportation facilities but also commercial complexes have

many functions mixed; are congested and noisy; structures are complicated; underground concourses have multiple levels and are not easily accessible.

- There is a lack of distinguished station architecture; few station which would communicate the community' identity; rare involvement of outside architects.
- Stations often lack appropriate station plazas and surrounding buildings do not harmonize with urban context of neither station nor plaza.
- Internal space of buildings and concourses is limited; standard dimensions are small.
- Too many objects are located on the platforms. Platforms and walls display a lack of composition and proper arrangement of furniture, information signs, etc.
- There are many types of information, station posters and paid advertisements but there is no clear physical separation between them; the method of displaying advertisements and signs is not standardized in terms of size, shape, color and they are not harmonized.
- There is a proliferation of signs and advertisements, which are located inside the train cars, on the platforms, and along the tracks (11-car JR Yamanote line train has 2,500 ads).

As is has been already emphasized, railway infrastructure took its part in deterioration of urban and natural scenery. The reasons can be perhaps attributed to difficult natural conditions. Because Japan is a mountainous country, it is difficult to construct high-speed railways without tunnels and elevated railroads. In spite of technological success of shinkansen trains, visual impact of elevated tracks obstructing view is particularly negative. Weak public awareness of aesthetics of engineering structures and existing preference towards aesthetics associated with technologies, have resulted in chaotic and disintegrated stations. As Japanese stations were descendants of post stations from Edo period, they have functioned as modern-day places of urban attraction and pleasure (*sakariba*) - being border-sites between performance and spectacle (Traganou 2004, Sorensen 2002). With the decline of railways since 1970s, and due to increasing motorization, majority of stations have also declined in their importance and appearance. Since then, stations have displayed lack of architectural form and excessive commercial orientation - "*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). Station structures are complicated also because of building improvements, the addition of floors and railway lines of different companies. That image, coupled with lack of architectural design (Fig.1, 2) and inadequate space, can be also attributed to lack of interest of railway companies to involve outside architects in station design. Since 1950s, standard rail structures and buildings have been usually in-house designed. Design competitions have been very rare and only recently along with the concept of "Station Renaissance" there has been some involvement of architects in public-private sector stations. However the collaboration between architects and rail engineers has been very difficult because of lack of mutual understanding.

Also, as many authors noted (Ashihara 1998, Sorensen 2002, at al.), ambiguous urban planning policy resulted in ambiguity of outline in urban architecture and in chaotic cities, which greatly contrast with European clarity of architecture and defined urbanscape. Problems of station space and station plaza can be related to weakness of land-use planning system, which specify only basic standards and which has been not used as a tool enhancing better townscape. In late Meiji (1867-1912) and Taisho (1912-1926) there was a strong concern about planning and aesthetics, which was reflected in planning ideas for Tokyo - "Tokyo City Improvement Ordinance" (*Tokyo shiku kasei jorei*, 1888) and Osaka. But, as Sorensen (2002) emphasized, there has not been effective system for securing land for public uses, such as roads, parks, and plazas. The very basis of planning has been founded on strong popular perception of real property rights-usage - that is up to landowner. Planning has been

driven by specific development projects rather than by the regulatory system that would control private development activity. Widely used Land Readjustment (LR) method has not been effective to achieve a comprehensive development. There were efforts to control urban planning, such as introduction of development permit system (*kaihatsu kyoka*) in 1968. District Plans (1980) allowed local governments to have an influence on detailed planning and enabled them to develop new methods of community-based planning, which has been generally referred as *machizukuri*. Despite these efforts city planning in Japan has been very much centralized and local government powers were limited by central government's development manuals. On the other hand, measures of deregulations have been effective in Special District Plan for Redevelopment – a practice introduced in 1988, which has stimulated urban redevelopment projects permitting private investment and compensating public facilities, such as roads and plazas. Lack of CSD can be related to the LR method and to weak basis of public support because the government always imposed planning. The amendments to City Planning Law of 1999 and 2000 finally granted independent legal authority for city planning to local governments, which could legally specify *machizukuri* ordinances in regard to District Plan, Land Use Control and Historical Protection. Decentralization of authorities is likely to promote more sensitive planning and better station design. However, as Sorensen (2004) has suggested, without improved local financial resources it may be difficult for local governments to implement planning and for *machizukuri* to have a significant influence on the improvement of stations. Its real impact will depend on the agenda of their councils, ways of their selection and on presence of democratic methods of decision-making on local level.



Figure 1. Shibuya Station, Tokyo



Figure 2. Aomori Station, Aomori Pref.

Comparing with European, Japanese planning system is less strict in control of imposed development and zoning is light in restrictions. Lower, than in Europe interiors can be seen, not only as a legacy from traditional architecture and life style concentrated on the floor (Shelton 1999) but also, as a result of inadequate modern building standards. Weak regulatory framework is also reflected in lack of control of advertising. The non-aesthetical appearance of stations depends also on the station management. Lack of aesthetic awareness among the public and loose urban control are reflected in simplistic and comics-oriented public design.

4. STATION RENAISSANCE

4. 1 Objectives and Practice of “Station Renaissance” in Europe

“Station Renaissance” was initiated for the first time by railway companies in Europe in 1980s, as their response to various challenges of railway sector and respectively as a result of technological potential of high-speed trains and as a factor of urban renewal, reflecting

growing environmental concern. As Thorne (2001) noted: *“It has been commonly observed that railway architecture has been experiencing a “renaissance” since the 1980s”* and as a result station architecture has very much improved. French SNCF, German DB, and other European operators put a “renaissance” of the stations along with technological improvements of trains and tracks on the top of their policies. Because today railway planners see trains as a part of broad transportation network and stations are often connected with airports, bus stations and parking lots - they must respond to different requirements than before. In the past station was designed more for trains than for passengers. Today, according to the concept of “seamless journey”, designers try to make travel experience more efficient by planning sophisticated stations, which include facilities arranged for ticketing, waiting, transfer and shopping. Railway architecture has become structurally, formally and functionally innovative and often reflects modern character of air terminals. To increase the appeal of railways, rail operators are shifting the public perception about the role of railways to culture, sustainable environment, urban renewal, safety and efficiency. European approach has been close to the USA-invented CSD transportation planning method, which although mainly related to highways, considers putting together a transportation system that takes into account a quality of life, and which according to Department of Transportation (DOT) is *“a collaborative, interdisciplinary approach that involves all stakeholders to develop a transportation facility that fits its physical setting, and preserves scenic, aesthetic, historic and environmental resources, while maintaining safety and mobility”*. In the USA, the development of CSD based on the awareness of the social and environmental impacts of infrastructure construction has been a gradual process (Otto 2000). Subsequently, these environmental and aesthetic considerations were put into law. Inclusions of public aware of aesthetics in comprehensive planning and design process, and pursuance of aesthetics in guidelines, have been also important features of European CSD approach, in relation to roads, railroads and stations. The scope of “Station Renaissance” includes construction of new stations conceived as a part of urban development projects and station renewal. The objectives comprise: aesthetics (ecological, simple forms, harmony of materials and colors); architectural quality; integration with surrounding; railway brand-design; access and interaction between platforms, building and street; safety; and respect for past values (Edwards 1997). Operators are trying to streamline their management by outsourcing maintenance and infrastructure with related business, and to specialize in operation business, the very core business for rail companies.

In Germany, DB Stations & Service, a part of German Railways (*Deutsche Bahn AG*), which has been divided and privatized in 1994, manages passenger operations and stations. Development and improvement of railway infrastructure is subsidized by EU, federal government, states and urban districts. “Station Renaissance” polices has been reflected in DB comprehensive station development program - the “Emergency Program” (2002), which has three goals - quality, economy and branded product - realized through modernization and refurbishment of station buildings, concourses and facilities; adjustment of platforms for high-speed trains; and implementation of new corporate design (in graphics, platform furniture). The concept of corporate design is realized through the reliance on aesthetics, overall unity and diversity of elements (Steguweit 1997). Immediate measures include the “3 S Program” that pursues “safety”, “super cleanness” and “service” (consumer-oriented information system, various provisions for children, travel and service centers). Through the concept of “Forum Station”, a station fulfills a function of a stage for public life and attraction. DB emphasizes importance of offering the customer aesthetic experience – something that previously was disregarded – through architecture and interior design. Due to decentralization of planning system and railways - private initiatives and local communities can practice CSD by being involved in station projects. One of successful projects was the renovation of

Leipzig Hbf (1997). The design was selected through the competition, a practice that is rare in Japan. Competitions reflect public awareness of aesthetics, stimulate the competitiveness among in-house and outside designers and allow selection of best projects. Leipzig Hbf was realized through the collaboration between DB, private investors and local government. Design concept relied on the combination of tradition with modern architecture, openness of station hall and provision of daylight in the manner of airport terminals. New vertical development was conceived as a 3-floor market place “Promenaden” (Fig.3). Ross (2000) and Tenner (2001) observed that this spectacular project brought a revitalization of the inner city of Leipzig and was a stimulus for further railway station projects in Koln and Hanover. New airport stations, such as Frankfurt Airport ICE Station (2000) or Koln/Bonn Airport Station (2000, Fig.4) represent new type of European air terminal railway station, which design is selected through a competition and is characterized by impressive architecture, inclusion of day-light at the platforms, use of lightweight steel and glass, and colorful lighting.



Figure 3. Leipzig Hbf “Promenaden”



Figure 4. Koln/Bonn Airport Station

In France the railways are also decentralized and local authorities have the capacity and control over the planning and financing of local rail transport. State subsidies are not given directly to railway operators but to regions and regional transportation organizations, such as STIF (*Syndicat des Transports d’Ile-de-France*) in the Ile-de-France. One of public operators – RATP (*Regie Autonome des Transports Parisiens*) responsible for public transport in Paris - has been a successful urban player concerned about an influence of stations on urban culture, working with urban planners and local residents (Kaminagai 2001). RATP’s CSD-like approach has been reflected in “renaissance” policies, such as station planning and renewal in accordance to urban planning; harmonization of transportation network, according to unified basic concept and individual design for particular station; “Cultural Program” for “cultural stations” - consideration of cultural heritage at “station-galleries”, cultural events, installation of public art and transformation of selected stations according to popular theme, such as “Europe”, “Sport”, etc. At Paris Metro, RATP has shown consideration for form and scale, based on the conviction that generous underground space and aesthetic arrangement allow for visual continuity from entrance to platform, and achieved through provision of large central distribution halls, natural light and huge colored luminaries (Fig.5). Design has been integrated throughout the network, based on precise rules for stations names, colors of walls, signs, and advertisements that have been regulated in terms of fixed size (3.0m x 4.0m).

French National Railways SNCF (*Societe Nationale des Chemins de Fer Francais*) have expanded their “Station Renaissance” policies since 1990s, through strengthened corporate design, vigorous station renewal, introduction of a new type of amenity combining transportation function with city services, such as recreation and retail. SNCF introduced

certification for stations, which comprise of 45 criteria, including aesthetics. New CSD approach along with new design based on “Station Organization Plan” – a comprehensive plan for intermodal transport and commercial development - has been implemented at new and modernized stations designed by the SNCF’s Station Design Office. While station renewal was based on careful studies on historical architecture, new stations, such as Satolas TGV (1994) at Lyon airport (Fig.6) or Lille-Europe (1994) at Lille, have been designed as innovative buildings with an airport terminal-like image. The Lille-Europe Station was conceived as a part of a larger urban project of a new city business district Euralille, which was realized through the collaboration on the basis of Public-Private Partnerships (PPP), comprising of local government, private developers, SNCF, and implemented by organizations, in which *communes* were major stakeholders. The public-private study partnership suggested a diversified program, on the basis of which was held a competition. The contest for a master plan, held among eight internationally known architects who were invited to present their ideas, was won by R. Koolhaas. The project combined a series of individual projects for business, retail and cultural facilities designed by renowned architects - C. de Portzamparc, C. Vasconi, J. Nouvel and R. Koolhaas - with a new transportation center. At the phase of public consultations important amendments were made to reinforce the physical integration of the complex with the surrounding area. The Euralille redevelopment project has been very successful, enhancing transportation links and bringing revitalization to the region (Bertolini at al. 1998). The TGV Lille-Europe Station designed by the SNCF architect J.M. Duthilleul resembles a classical train shed made of modern transparent and light structure with curved roof and glass walls. The winner of the competition for the new central hall of the TGV Satolas Station was an architect S. Calatrava. The design accomplished through the collaboration with Station Design Office has been composed of a concrete roof structure covering platforms, the central part of which comprised a “glass and steel bird” framework rising over the station hall. These and many other new station projects based on new guidelines have reflected a new “renaissance” approach of the railway operator.



Figure 5. Haussmann-St-Lazare Station, Paris



Figure 6. Satolas TGV Station, Lyon

In the United Kingdom like in Germany, national railways have been divided and privatized in 1994. Infrastructure has been separated from operation and currently, since 2002, Network Rail has owned and managed railway facilities, while passenger operations have been franchised under the Private Finance Initiative (PFI) and have been operated by twenty-five operating companies (TOCs). In London, Transport for London (TFL) manages subway, Light Docklands Rail (DLR) and bus services, which are operated by eleven TOCs. One of them is London Underground Ltd. (LUL). By using PPP, LUL could enhance and modernize stations and introduce new rolling stock. Railways are also subsidized; for example LUL and other TOCs receive subsidies through the public organization – Strategic Rail Authority (SRA).

Throughout the history of Britain's railways, there has been presumption against them being involved in commercial land development and other non-railway activities. Majority of purely commercial developments has been realized through either partnership with private sector or sale of the freehold. Thus railways lost many development sites and many stations have been closed. Since privatization, "Station Renaissance" has been reflected in diversification and expansion of station trading and in new commercial developments in newly created station spaces. Stations also have been better prepared to match their social context – through provision of parking lots for cars and bicycles, better accessibility, provision of services in accordance to local needs, and through better quality of operations, services and design that includes CSD principles, such as public involvement, competitions, and aesthetic guidelines.

Network Rail (NR), in order to achieve new station image – safe, configured to seamless process, comfortable and enjoyable, as well as preserving historical heritage - has promoted new railway station's goals, such as: quality (improvement and renewal); operation (balanced services; and access (provision of interchanges, barriers-free). Policies boosting new image of railway have been reflected in NR guidelines, such as "Developing modern facilities at stations", "NR heritage guidance", "Way finding and signing guidance", and "Advertising design strategy". Implementation of the "Station Renaissance" policies has been reflected in realization of new stations (e.g. Stratford Regional, 1999; Manchester Piccadilly, 2002), and in refurbishment of historical ones, according to major stations renewal program - "Station 2000". Fourteen historical terminals in London have been modernized in collaboration with TOCs and municipal government, as a part of urban development projects. Newly constructed and rebuilt railway stations have shown CSD approach through the integration with other public and environmentally benign transportation modes. In spite of retail, new functions such as multi-screen complexes, fitness clubs, bowling centers have been introduced at the stations. One of London's successfully modernized historical terminals – Paddington (1999), among many improvements of main concourse, platforms, shed and building's facades - has been also equipped with new multileveled shopping, eating and waiting area – The Lawn, which design was selected through competition won by architect N. Grimshaw. Historical terminals have been also modernized to accommodate platforms for high-speed trains. At the Waterloo Station, new Eurostar terminal - Waterloo International (1994, competition won by N. Grimshaw), has been designed as a multileveled facility that includes platforms under steel and glass-400m-long arched roof, which provides airport-quality accommodation.

London Underground (LUL), which has a history of over 140 years, has had a tradition of appointing leading architects for its architecture. Since 2002, the constructions of new stations and renovations have been conducted through PPP. Station renewal and new stations projects, such as at the Jubilee Line Extension (JLE) or Docklands Light Rail (DLR), have been conducted according to CSD principles - consulted with local authorities, communities, English Heritage, and subsidized by the government. The scope of modernization included new decoration, modern CCTV network, more help points, improved platform information system, new coordinated signs, and better and more accessible facilities. The fact that different architects were appointed for each JLE station, resulted in diversity of designs. Common considerations included provision of large and clear underground spaces, where a need for signs has been reduced to a minimum. New stations, with original lighting and impressive large entrances with curved glass and steel roofs, display sophisticated high-tech look in sense of design (Fig.7), and user-friendly facilities in terms of function. Canary Wharf Station (1999) on the JLE has become a landmark and a symbol of the underground station of the future (Fig.8). In Europe since 1980s, a renewed interest in urban renewal assisted by decentralization of planning and privatization of railways had a strong impact on station

design that has reflected a CSD approach and qualities. Station projects, realized as a part of urban development through collaboration with communities and in consideration of landscape and aesthetics, have greatly improved urban amenities, as well as efficiency and attractiveness of rail travel.



Figure 7. Heron Quays, DRL, London



Figure 8. Canary Wharf, JLE, London

4. 2 Objectives and Practice of “Station Renaissance” in Japan

While railways are popular mode of land transportation in Japan and their role is greater than in Europe (in 2001 the Japanese traveled 3034 km per person per year, while Europeans only 810 km/p), the majority of existing “convenient stations” satisfy basic needs but not aesthetic. In most European countries, train operation and management of stations has been separated from track business (management and development of rail infrastructure). The priority has been put on reducing operation costs. In Japan the Japan National Railways was divided in 1987 into six regional operators. JNR did not divide the train operators and infrastructure like some European countries did. Unlike in Europe, new private railways – JR – have been in charge of all components of railway operation – all infrastructure including rolling stock, railroad tracks, maintenance facilities, train operation, station maintenance, as well as for other businesses (kiosks, shops, restaurants) at the stations. Therefore they have been willing to expand their business fields and to profit from related businesses. Currently JR companies have been promoting a rail travel through the “Stations Renaissance”, focusing on improving railways through better services and attractive stations. They may have more difficulties in improving their stations than their European counterparts due to financial constrains – lack of subsidies for railroads and less subsidies for stations, than in Europe.

The scope of “Station Renaissance” included planning and construction of new stations on new lines accompanying the growth of cities, on existing lines - as a response to local needs, and refurbishment of existing major terminal stations - as an initiative of privatized JRs and other railway companies. Refurbishment has been based on amenity improvement programs, which from one side enhanced aesthetics through barrier-free design, inclusion of amenities (new entrances, toilets), better information signs, new facilities, and commercial developments – and from the other side promoted attractiveness of rail to increase a revenue. Among these initiatives have been JR East’s “Sunflower” and “Cosmos” programs, Tokyo Metro’s – “Metro Refresh “S” program, “Good Station – Good Metro” program (since 2004), etc. “Cosmos Plan” has subjected to renovation major JR East (JRE) terminal stations with more than 200,000p/d. At Ueno (2002), the purpose of renewal was to raise convenience of rail travel and to remove barriers, as well as to build pleasant station by incorporating lifestyle

service facilities. Station space has been upgraded (Fig.9) and sophisticated commercial space at the “Atrium Ueno” with total floor area of 6,000 m² has been included. Renewal of another station - Shinagawa (2004) - contained also development and upgrading of station space, construction of shinkansen platforms and facilities, and introduction of an attractive commercial space at the “Atrium Shinagawa”. Projects have been successful (Ishikawa 2003), however not comprehensive – in case of Ueno it has not included platforms and underground concourses (Fig.10), which are low and inconvenient. In case of Shinagawa, a shinkansen station is rather typical, although equipped with up-to-date information facilities.



Figure 9. Ueno Station Hall, Tokyo



Figure 10. Ueno Station Concourse



Figure 11. Shinjo Station, Yamagata Pref.



Figure 12. Kodenmachi Station Platform, Tokyo

Renewal and construction of more than 360 urban stations serving more than 30,000 p/d has been realized under the “Sunflower Plan”. Some new station buildings with office space and shopping centers, such as Meguro Station housing JRE and Toukyu Corporation lines, have been constructed as a result of joint ventures between railway operators. JRE has been continuously modernizing its station spaces and putting a lot of attention on development and restructuring of retailing and restaurants. On the top of company’s activities is promotion of cultural events, such as exhibitions and concerts held at Tokyo station. Some stations, such as on Yamagata shinkansen (1999), have been designed in cooperation with local governments in regard to their location and use. Akayu Station (1993, arch. E. Suzuki) has been designed under the concept of association with nature and with airport terminal. Station was realized in line with practice of *machizukuri*, which was based on JRE project “Silver Stream 21 Wing” tying up with local government’s guidance and local community’s initiative. Station provided a city hall spaces, plaza, and barrier-free access. Yamagata shinkansen terminal at Shinjo Station (1999, arch. K. Yamashita, Fig.11) featured also distinctive design, which was unusual

for the majority of Japanese high-speed train stations. Some currently planned stations, such as Asahikawa in Hokkaido, show even more comprehensive and inclusive planning approach.

One of the problems of Japanese stations, which JRE and other operators, such Tokyo Metro (TM) wanted to address through their “Station Renaissance” policies, is associated with prevailing ambiguous information signs, which are confusing particularly in light of increasing demand for the “barrier-free” and “universal design”. After privatization, JRE has revised the “JR East Sign Manual” created in 1990 and has been improving in-station signs since then. Since 2002, JRE has started a survey to obtain the clues for solutions in order to materialize “*comprehensive station design for improved amenity*” (Yanagiwa et al., 2004), in which station amenity has been understood as a combination of three elements: smooth flow, dissemination of appropriate information, and comfortable environment. Such surveys conducted by railways, help to improve station environment. At first, signs were improved at Ueno in 2002, and then in 2003, JRE has created plans for improvement of in-station signs at major metropolitan stations. Signs improvement by all JR operators played significant role not only in terms of support of smooth flow of passengers, but also in terms of creation of station environment and establishment of corporate identity of each of JR companies. However still many Japanese stations have a large number of supplemental, old, and handmade signs, therefore there is a need to implement truly integrated sign system.

At old lines of TM, such as Ginza, Marunouchi or Hibiya (Fig.12), signs and posters have not been organized yet very well. City Planning Law stipulates that concourses under, or above streets, have to be coordinated with municipal government. Thus it is difficult in many cases to implement total design. Though TM has its “Renaissance” policies for better design aiming for “high-quality, amenity, totality”, and it is gradually improving its stations, there has been still lack of really bold approach. Better and nicer stations are on new lines, such as Namboku, where the art walls can be seen through the platform doors. Other concepts for attractive stations include media walls – panels indicating local characteristics, symbolic columns at the entrances, “*fureai* corners” – featuring some local themes, etc. New pilot signs appeared so far only at Ginza and Otemachi Stations. At TM, in-house architects are responsible of station design; there are no competitions and there is lack of public involvement.

Particularly successful are stations on the Minato Mirai Line in Yokohama (2004), which feature good details and express conceptual links with aboveground environment through provision of large spaces designed with local context. Since in Japan design control is weak, in reality aesthetics of each station depends on stationmaster and it reflects his aesthetic taste. In general, though there are examples of good stations designed by JRE, TM and other operators, there is need to popularize aesthetics of railways more, and to undertake new policies incorporating CSD, to enable the majority of stations to accomplish aesthetic design.

5. APPLICATION OF CONTEXT SENSITIVE DESIGN FOR RAILWAYS IN JAPAN

Many approaches of European railway companies, their awareness of social and environmental impacts of transportation, and their collaboration with local authorities and communities on environmentally sensitive design, can be considered similar to the USA approach of Context Sensitive Design. CSD, which incorporates public involvement and inclusive planning process, has been so far mainly applied for streets and highways but its scope includes also, as a part of landscaping and scenic beautifications - restoration and preservation of railway stations. In consideration to European stations, similarity with CSD

includes democratic planning process that involves local communities, careful considerations of aesthetics, landscape and environmental impacts in all phases of projects, as well as consideration of station space as it interfaces with adjusted land uses. In such context, CSD that strengthens community character and is related to railway stations can be applied as the “Context Sensitive Design for Railways” (CSDR) - in order to realize future better stations.

CSD is built on interactive relationship between land-use and transportation to make transportation facilities more functional and beneficial for mobility, area livability, land-use viability, and for active and attractive cities. It serves variety of users, including the aged and handicapped. In the USA, the efforts to increase understanding within engineering community of CSD include training for transportation designers and workshops. Otto (2000) emphasized, that designing for environmental or social characteristics of an area, in consideration of landscape and aesthetics, rather than mitigating the effects of design, requires more flexible standards than have traditionally been used. CSD does not attempt to create new standards but it explores opportunities to use flexible design and broad-thinking methods, beyond fixed procedures, structures, and traditional determining factors. In Europe and USA, the CSD criteria include input from local stakeholders, from the area landowners, from businesses and residents, who provide essential design objectives.

In case of railways, in most of EU countries and in Japan railways are private-owned. In Germany and England they are subsidized by public authorities, in France railways are national and they are controlled and subsidized by the government through regional organizations. In Japan government controls infrastructure development and issues guidelines but station design depends on railway companies, which prepare their own guidelines. It is difficult to expect that railway companies will prepare strict guidelines on sensitive design because their policies are mainly profit-oriented. They try to solve some aesthetic problems knowing that better stations will attract more customers but since public does not strongly demand aesthetics, their approach is limited. Japan needs more rigid standards in regard to aesthetics and protection of environment. The country also needs CSDR and enforcement of planning, which would allow interactive relationship between land-use and railways. It is necessary to introduce some sort of control by local governments and local communities on private owners - in sense of building permits approving aesthetic quality of architecture, and urban planning permits approving spatial relations between station and surrounding. Improvement of RL should be achieved by improving general standards, rather than by concentrating on particular development projects. The efforts should also focus on better understanding of necessity and contents of the CSDR, through education of practitioners and public on various seminars and workshops. Railway stations in Japan have to be widely understood as public facilities, which have to respond to high public standards.

6. CONCLUSIONS

Generally in most cases stations in Japan have been designed by rail companies, without exchange of ideas with local communities and without local context. The applicable concept of CSDR - in consideration of aesthetics, public involvement and interdisciplinary approach - has not been popular in Japan. Stations conceived in typical way have been standard, based on rail company interests, such as efficiency of passenger flow and economy of construction and maintenance. Facing competitions Japanese rail operators started to promote “Station Renaissance”, as a tool for improvement of existing stations and for construction of more attractive new ones. Some recent stations, which have been built with local subsidies, have

reflected better quality of design due to careful planning by committees comprising of rail companies, municipal governments, related consultants and residents. The major features of CSDR, such as interdisciplinary collaboration that involves public and private organizations, aesthetic, environmental and landscape considerations, station planning coordinated with urban planning, involvement of urban planners and architects, and active involvement of local residents - have proved on the example of some new projects (Asahikawa and Obihiro Stations in Hokkaido, Hyuga Station in Miyazaki, Kochi Station) - to be an effective way for planning and design and good strategic way for the future. However such planning process is very long and requires many improvements. It is also difficult to realize comprehensive planning and design because there is a strong division in professions and laws in regard to structures and architecture. New Landscape Law (2004) has allowed local governments to designate areas for special protection, where buildings have to be approved for scenery aspects and where special measures apply for communal facilities – to preserve scenic and historic features of urbanscape and countryside. Local governments have been empowered to set up groups with local residents and railway companies to discuss policies in scenic beauty. Such approach, which comes close to CSDR method, would be a good tool for better stations, if stations will be strongly perceived as communal facilities, which should be accountable for their beauty. Stations should continue tradition of Japanese aesthetics and be designed with consideration of the concept of *meisho* - in the spirit of traditional places of Japanese scenic beauty and community identity. Design principles should be shifted from technology-centered design to human-centered, to include RL. Local resident should have an opportunity to participate in decision-making and these decisions should reflect independent public opinion. Designs should be often selected through competitions and a collaborative, interdisciplinary approach should be practiced at all phases of the projects. In such process of Context Sensitive Design for Railways future station will become a combination of functional efficiency and aesthetics – to bring transport and services together.

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