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MASTERTHESIS

TOKYO'S URBAN REDEVELOPMENT BY MEANS OF PRESERVATION ON THE EXAMPLE OF TOKYO STATION

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-

Graz on 02. Jänner 2015

Picture 1 – JR East Press Release, May 8th, 2007

Picture 2 – JR East Press Release, March 2nd, 2004

Picture 3 – JR East Press Release, November 6th, 2003

Picture 4 – JR East Press Release, November 6th, 2003

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„Ever downward water flows,

But mirrors lofty mountains;

How fitting that our heart also

Be humble, but reflect high aims."

Empress Shoken

(Ort), am (Datum)

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(Unterschrift des Studenten)

Abstract

During the mid-1850's Edo, nowadays Tokyo, was already a prosperous city with a population of about one million, however social and political changes during Meiji era awoke the city and shaped it into the modern capital of an industrialized nation. Despite the Great Kanto earthquake in 1923 and vast destruction during WW II Tokyo's population increased rapidly and the city grew out of its boundaries due to population growth and building activities. Experiencing and being constantly exposed to the threat of a major earthquake, Japanese society did not develop strong relations with modern architecture. Western experts helping establishing modern day Japan brought this concept with them and it was slowly adopted by Japanese society resulting in a relatively late preservation movement and in the loss of the majority of historic structures. Moreover safety regards and increasing demand often caused the replacement of ancient structures.

Today matters regarding preservation are carried out by the Agency for Cultural Affairs, which is a special divison of the Ministry of Education, Culture, Sports and Science and Technology (MEXT). The Japanese Cultural Properties Law defines six types of preservation categories including historic buildings. Additionally Tokyo created "Guidelines for the protection of historical scenic sites" including a 100 meters boundary around historic sites in which is required to design and construction with respect for historical structures.

Greater Tokyo Area, home to more than a quarter of Japan's population and generating more than a third of Japan's GDP, is the biggest real estate market and responsible for most redevelopment projects. Thereby the Bureau of Urban Development is responsible for urban development and functions such as building administration and development control. In order to stimulate development the Bureau can make use of several instruments, most effectively used are the Floor Area Ratio Bonus System and the Urban Renaissance Emergency Areas which permit exceptions of regulations. Most regulations regarding redevelopment were enacted after 2000 and applied on the Tokyo Station City Project for the first time. Tokyo Station represents a perfect example of Japanese approach towards building in an existing environment. Collaboration of all stakeholders, intensive cooperation with authorities and sensitive planning made it possible to merge futuristic design with a historical structure revitalizing surrounding area and representing sustainable utilization of architectural substance.

Despite stimulation of development, future population estimates predicting a decrease by approximately one third until 2040 inevitably will result in decreased demand. Moreover, real estate prices sharply decreased after the asset bubble burst and are stagnating since.

Furthermore the majority of inner-city buildings older than 30 years have to be modernized within the next two decades.

Outdated building substance, shrinking population, and short-time investment by international real estate trusts make it necessary to rethink Japan’s approach towards building. Utilization by modernizing dated structures may offer a possibility for sustainable urban development.

Kurzfassung

Bereits Mitte des neunzehnten Jahrhunderts war Edo, heute bekannt als Tokyo, eine florierende Stadt mit über einer Million Einwohner. Gesellschaftliche und politische Veränderungen während der Meiji Periode formten die Stadt zu einem modernen Zentrum einer industrialisierten Nation um. Trotz Zerstörungen durch das Große Kanto Erdbeben und während des 2. Weltkrieges wuchs die Stadt rasant. Durch oftmalige Zerstörung und andauernder Erdbebengefahr entwickelte die japanische Gesellschaft keine starken Bindungen zu moderner Architektur. Erst mit Hilfe westlicher Experten, die beim Aufbau Japans zu einer modernen Industrienation halfen, gelangte die Idee der Bewahrung historischer Gebäude nach Japan und wurde langsam von der Bevölkerung akzeptiert. Dies führte zu einem recht spät betriebenen Objektschutz und Restaurierung und damit zum Verlust eines Großteils des architektonischen Erbes dieser Kultur. Darüber hinaus führten ein erhöhter Bedarf und Sicherheitsbedenken zum Abriss bestehender Bauten.

Als eigenständige Abteilung des Ministeriums für Bildung, Kultur, Sport und Wissenschaft (MEXT) fungiert die Agentur für Kulturelle Angelegenheiten als Behörde für Denkmalschutz und –pflege. Dabei fungiert das Gesetz betreffend Kulturelles Eigentum als wichtigste Maxime und definiert schützenswerte Objekte. Zusätzlich erließ die Tokioter Stadtregierung Richtlinien zum Schutz von historischen Anlagen, darin ist festgelegt im Umkreis von 100 Metern um schützenswerte Objekt mit Rücksicht auf deren historische Bedeutung zu planen und zu bebauen.

Der Großraum Tokio ist Heimat von mehr als einem Viertel der Gesamtbevölkerung Japans, mehr als ein Drittel des Gesamtbruttoinlandsproduktes wird dort geschaffen und ist gleichzeitig auch der größte Immobilienmarkt und damit verantwortlich für die meisten Neubauten. Das Büro für Stadtentwicklung ist zuständig für Stadtplanung und übt auch regulierende Funktion wie Gebäudeverwaltung und Entwicklungskontrolle aus. Zur Stimulierung von Projekten kann das Büro deregulierend in den Markt eingreifen. Dabei dürfen Ausnahmen von Regelungen vorgenommen werden und auch erhöhte Bebauungsdichten gewährt werden. Gesetzliche Basis dafür schufen mehrere Gesetze welche nach 2000 in Kraft traten. Die meisten wurden im Zuge der Modernisierung des Hauptbahnhofes Tokio zum Ersten Mal angewandt. Dabei repräsentiert der Umbau des Bahnhofs ein ideales Beispiel für den derzeitigen japanischen Zugang zu Bauen im Bestand. Die gute Zusammenarbeit zwischen allen Interessensvertretern und den Behörden ermöglichten eine Modernisierung der Anlage und eine nachhaltige Nutzung des bestehenden Gebäudes.

Trotz der Möglichkeit stimulierend in den Markt einzugreifen zeigen Prognosen eine erwartete Bevölkerungsreduktion um mehr als ein Drittel bis 2040, damit einhergehend einen starken Einbruch der Nachfrage. Zusätzlich stagnieren die Immobilienpreise seit dem Platzen der Immobilienblase in den 1990ern auf relativ niedrigem Niveau. Hinzu kommt noch die langsame Überalterung des Bestands. Überalterter Bestand, eine schrumpfende Bevölkerung und nur kurzfristig gebundenes Kapital internationaler Investoren machen es nötig, dass Japan seine Strategien hinsichtlich seines Immobilienmarktes überdenkt. Eine langfristige Nutzbarmachung von bestehenden Bauten durch nachhaltige Modernisierung bietet die Möglichkeit zukünftigen negativen Entwicklungen entgegenzuwirken.

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Table of Abbreviation

JR East	East-Japan Railway Company
TSC	Tokyo Station City
R&E	Research and Education
US	United States of America
EU	European Union
TMG	Tokyo Metropolitan Government
MLIT	Ministry of Land, Infrastructure, Transport and Tourism
O-M-Y	Otemachi-Marunouchi-Yurakuchou
FAR	Floor Area Ratio
GTA	Greater Tokyo Area
GDP	Gross Domestic Product
UN	United Nations
UNESCO	United Nations Educational, Scientific and Cultural Organization
ACHP	Advisory Council on Historic Preservation
FP	Framework Programme
MEXT	Ministry of Education, Culture, Sports and Science and Technology
Corp.	Corporation
Ltd.	Limited
JACIC	Japan Construction Information Center
JSCE	Japan Society for Civil Engineers
OCAJ	Overseas Construction Association of Japan
EIA	Environmental Impact Assessment
UPA	Urbanization Promotion Area
UCA	Urbanization Control Area
UUA	Undivided Urban Area
WW II	Second World War
JP	Japan Post
J-REIT	Japan Real Estate Investment Trust

0 Introduction

During the post-world-war II era developing countries experienced rapid urbanization. Major cities in Europe, the US and Japan expanded quickly and density increased sharply. Still having moderate population growth rates, future population estimates conclude a reversal of trends. Consequently cities in developed countries will have to face resulting upcoming problems. Therefore buildings constructed mainly during the 1960's and 1970's often do not meet modern needs or fulfill modern standards need and have to undergo modernization, making immense investment necessary. On the one hand urban space will face decreasing population on the other hand a massive number of outdated buildings has to be modernized. While in EU and partly in US the trend is construction in existing environments in other words modernization of existing structures, it is still state of the art in Japan to demolish old buildings and replace them by new structures. Preservation and modernization may be more cost and resource efficient and can be seen as optimum of utilizing existing architectural substance. On the other hand after recent economic crises inner-city estates proved to be safe investment leading to increased demand and higher market prices causing a boost of new development projects, a trend also occurring in Japan. This results in partly replacing existing structures to increase supply. Especially liberal regulations in Japan tend to support new structures instead of enhancing modernization of existing buildings. Nevertheless the public is becoming more and more aware of the cultural importance of historic buildings and their contribution to the attractiveness of urban space. An increased number of public initiatives to save old structures throughout developed countries were observed in the past decades and the Japanese public opinion slowly changed to taking action to rescue ancient buildings from demolition.

Aim of this thesis is to analyze Japanese approach towards redevelopment and building in existing environments regarding preservation and creating a base for a debate about utilization of dated structures in Japan.

Starting with a general discussion about preservation in the US, Europe and Japan helping to understand the difference of Japanese approach towards building heritage the thesis introduces institutions and regulations regarding preservation followed by an analysis of various architectural concepts of preservation and public awareness of specific historic structures. To narrow down the area of observation Tokyo and its concept of urban planning and instruments supporting redevelopment is focused on helping to understand market conditions, as well as negative impacts on urban landscape. Examples illustrating redevelopment instruments in combination with modernizing historic structures will be used to demonstrate Japanese public and private effort to preserve

architectural heritage. Specially a detailed description of Tokyo Station City Project representing an optimum utilization of a historic site by merging modern-day design and technology with the landmark historic station building is presented. This widely-known project demonstrates the possibilities of modernizing historic buildings with the aim of sustainable utilization. Additionally current and future trends of the real estate market in Tokyo are analyzed to examine effects of modernizing structures. Finally by using estimates, real estate market data and governmental strategies proposals for future actions regarding building in existing environments are defined.

1 Building preservation

In order to be recognized as a particularity in our modern, globalized world for many countries preservation has become more important than ever to define themselves through their cultural heritage. Preservation also enriches diversity and strengthens communities within our modern society. In this chapter a general discussion about preservation is intended. So different points of view will be analyzed, historical and current developments in the US, EU and Japan preservation will be explained.

1.1 Preservation in general

The architectural landscape of a country has always been greatly influenced by authorities and their subsidiaries resulting in a great stock of historically important structures owned by public institutions. In this paragraph public approach towards preservation is explained. Also a general introduction to preservation schemes in the US, EU, Japan and the role of the UNESCO is added.

1.1.1 The Preservation discussion at UNESCO and its role in supporting Preservation

United Nations
Educational, Scientific and
Cultural Organization

> *„ [1] The purpose of the Organization is to contribute to peace and security by promoting collaboration among the nations through education, science and culture in order to further universal respect for justice, for the rule of law and for the human rights and fundamental freedoms which are affirmed for the peoples of the world, without distinction of race, sex, language or religion, by the Charter of the United Nations. [2] To realize this purpose the Organization will (c) Maintain, increase and diffuse knowledge: By assuring the conservation and protection of the world's inheritance of books, works of art and monuments of history and science…"*[1]

Founded as part of the UN in 1945 UNESCO pursues to establish peace on the basis of humanity's moral and intellectual solidarity. Among several missions "Building intercultural understanding through protection of heritage and support for cultural diversity"[2] including the "World Heritage"-Program is probably the most common known project. UNESCO defines heritage as our legacy from the past, which is an irreplaceable source of life and inspiration and should be preserved to pass it on to future generations. World heritage declared by UNESCO is

[1] Constitution of the United Nations Educational, Scientific and Cultural Organization

[2] https://en.unesco.org/about-us/introducing-unesco, on January 2nd, 2014

considered as internationally important and should belong to all the people around the world. It is unquestionable that sights like Pyramids, Stonehenge, Angkor Wat and countless other monuments of human history should be protected and preserved supported by the international community. It is the ability to create, which built breathtaking and astonishing monuments lasting for millennia and it is their history, we can learn from and our duty to pass on our legacy. The UNESCO convention of 1972 represents the beginning of international protection of heritage containing duties for States Parties, committing them to protect what is defined within the convention as world heritage and also to establish national heritage protection laws. Furthermore the World Heritage Fund, which supports States Parties to carry out their protection and preservation plans as well as giving funds for urgent cases, was created and its purpose explained by the convention.

1.1.2 Situation in the US

> *„The preservation of this irreplaceable heritage is in the public interest so that its vital legacy of cultural, educational, aesthetic, inspirational, economic, and energy benefits will be maintained and enriched for future generations..."* [3]

So written in the US National Historic Preservation Act enacted in 1966. America with its ethnical and cultural diversity defines itself strongly through its recent history, including built heritage. Skyscrapers such as the Flat Iron Building, the Empire State Building or the Chrysler Building, the era of Art Deco and modern architecture, with famous representatives like Mies van der Rohe, Frank Llyod Wright, Sullivan and so on, played an important part in creating urban landscape of US cities.

[3] Title 1, Section 1(b)(4) of the National Historic Preservation Act of 1966

Figure 1.1 The groundbreaking skyscraper “Flat Iron Building”. [4]

The ACHP, the Advisory Council on Historic Preservation, advising the President and Congress on national historic preservation policy, has been established through the enactment of the Preservation Act in 1966. Furthermore several federal, state agencies, local government sections and private organizations are enhancing and observing preservation. Despite these organizations the ACHP is the only entity with legal responsibility to encourage federal agencies to factor historic preservation into federal project requirements.

Research done in 1997 and 1998 analyzing the impact of investment in preservation found that preservation creates more jobs and generates higher income than investing in new structures. The National Historic Rehabilitation Tax Credit certified investment of about $688 million in 1997[5], which generated income of $762 million[6] and $319 million[7] in taxes. Also it was proven that $1 million invested in preservation created on average 2 jobs[8] more and generates $100,000[9] more income than the same amount invested in new construction. Based on the data by Listokin and Lahr preservation initiatives by the US government proved as successful and efforts have been intensified ever since. Furthermore the Rutgers University, New Jersey established a preservation economic impact model for the US, forecasting total economic impact of

[4] http://michaelminn.net/newyork/buildings/downtown/flatiron_building/, on January, 9th, 2013

[5] The Contribution of Historic Preservation to Housing and Economic Development, Listokin and Lahr, 1997, page 456

[6] The Contribution of Historic Preservation to Housing and Economic Development, Listokin and Lahr, 1997, page 456

[7] The Contribution of Historic Preservation to Housing and Economic Development, Listokin and Lahr, 1997, page 456

[8] The Contribution of Historic Preservation to Housing and Economic Development, Listokin and Lahr, 1997, page 459

[9] The Contribution of Historic Preservation to Housing and Economic Development, Listokin and Lahr, 1997, page 459

preservation projects by calculating job creation, employee wages, state and local tax creation based on project characteristics.

1.1.3 Situation in EU

Not only is the Preservation Act presenting a good example favoring historic preservation. Most European countries enacted preservation laws with similar definitions. Preservation in Europe can look back on a long history and tradition. Cultural diversity and high density of historical monuments enhanced preservation movement. For the ruling monarchs it was necessary to preserve historic structures. Many rulers supported and financed vast restoration projects throughout Europe, such as the French Emperor Napoleon III or the Kings of Bavaria. Their castles and palaces were adapted and preserved over centuries. Not only have they been used for living in, they also were centers of reign. Preservation was prestigious, restoring and preserving historic structures and opening them to the public allowed people to get in touch with history helping to establish national pride. Furthermore the Catholic Church with its historically grown hierarchical system showed great interest in preserving their heritage. The desire for divinity created outstanding structures such as the colossal Gothic cathedrals, dominating the scenery of European cities for over 600 years created to mesmerize the crowds. During centuries these historic monuments suffered from wars, revolutions and pollution, among many examples there is Notre Dame de Paris, damaged severely during the French Revolution. In 1845 restoration started under the supervision of the famous French architect Eugenè Viollet le Duc. Le Duc, probably the most prominent preservation architect during the 19th century, also renovated Carcassonne and Mont Saint Michele. Nowadays these three monuments are the most visited sights in France.

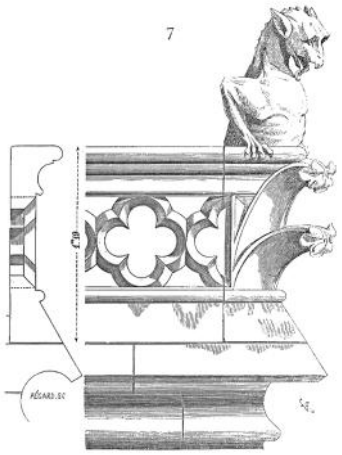


Figure 1.2 Sketch of a Balustrade in the Dictionary of French Architecture from 11th to 16th Century by Eugenè Viollet le Duc. [10]

The enactment of Preservation laws for EU member states is lying within the domain of national governments. Preservation is however considered as of important economic and cultural value by the EU. The first resolution of the European Parliament concerning protection of architectural heritage was enacted in 1974, including a wide range of programs supporting member states to carry out protection programs as well as funding research on the field of preservation. Seven EU Framework Programs (FP), subsidizing multiple research fields, financed most preservation research programs and is being extended until 2020, with an expected budget of around € 80 billion[11]. Nowadays millions of tourists visiting Europe's cultural heritage every year, directly and indirectly create 8 million jobs.[12] Due to increased interest in EU the European Commission adopted the European agenda for culture in 2007 and three main objectives were defined:

- Promoting cultural diversity and intercultural dialogue
- Promoting culture as a catalyst for creativity in the framework of the Lisbon Strategy for growth and jobs
- Promoting culture as a vital element in EU external relations

EU defines cultural heritage as a valuable store of knowledge and treasure of significant historical and socio-economic importance.

[10] http://fr.wikisource.org/wiki/Fichier:Balustrade.cathedrale.Paris.2.png, on January, 9th, 2014

[11] http://ec.europa.eu/programmes/horizon2020/en/what-horizon-2020, on January, 9th, 2014

[12] Preserving our heritage, Improving our environment, Volume I, European Commission

1.1.4 Situation in Japan

Japan developed a different approach towards architectural heritage due to constant threat of natural disasters, especially earthquakes. Traditional Japanese architecture was designed for fast rebuilding. Japanese got used to losing and rebuilding their homes several times during their lives, resulting in little emotional relation towards architectural heritage. Furthermore in Shinto religion natural places such as trees, mountains and rivers are more related to gods and spirits than buildings. Nevertheless by its richness in details and complex wooden structures Japanese architecture became well known all over the world. However due to modernization in the Meiji era and developing into a global player Japan considered architectural heritage in a different way. In recent years a broad public movement favoring preservation of this heritage was established and pre-modern Japanese architecture as well as preservation of Meiji era structures is increasingly appreciated by the international community.

Figure 1.3 The Hōryūji's Five-story Pagoda, part of the oldest remaining wooden structure on earth.[13]

The first law enacted in Japan regarding cultural property was the Historic Objects Preservation Proclamation in 1871. This especially regulated the protection of Shinto shrines and was strongly related to the Emperor's function as Shinto priest. However, the most important step

[13] What is Japanese Architecture

creating legal framework regarding preservation was set with the enactment of the Law for the Protection of Cultural Properties in 1950. Currently matters regarding preservation are carried out by the Agency for Cultural Affairs, which is a special division of the Ministry of Education, Culture, Sports, Science and Technology (MEXT). The Agency was established in 1968 to promote Japanese culture and international cultural exchange. In 1975 the Cultural Properties Law was enacted, creating six types of preservation categories. [14]

1. Tangible cultural property including buildings, paintings and sculptures
2. Intangible cultural property including theater, music and applied arts
3. Tangible and intangible folk property including houses, clothes, manners and customs
4. Monuments including man-made and natural sites, plants and animals
5. Cultural Landscapes including terraced rice fields and mountain villages
6. Traditional building groups

In 2012 more than 2,300[15] structures regarded as cultural properties, more than 1,600[16] historical sites and over 18,600[17] traditional buildings were listed by the Agency. These buildings are subject to the Law for the Protection of Cultural Properties, enacted in 1950, last amendment in 2007. Furthermore local government and private organizations enhance preservation. TMG for example constituted in 1997 the Tokyo Metropolitan Government Scenic Regulation and released a list of important structures and gardens in Tokyo, extended in 2004. Beside Preservation Laws Tokyo enacted “Guidelines for the protection of historical scenic sites”. By means of these guidelines redevelopment of historic buildings and constructions within a 100 [18] meters boundary around historic sites respect to historic importance is required.

[14] Preservation and Utilization of Cultural Properties, MEXT, 2012, Page 34

[15] Preservation and Utilization of Cultural Properties, MEXT, 2012, Page 34

[16] Preservation and Utilization of Cultural Properties, MEXT, 2012, Page 34

[17] Preservation and Utilization of Cultural Properties, MEXT, 2012, Page 34

[18] Urban Development in Tokyo, Bureau of Urban Development TMG, 2011, page 21

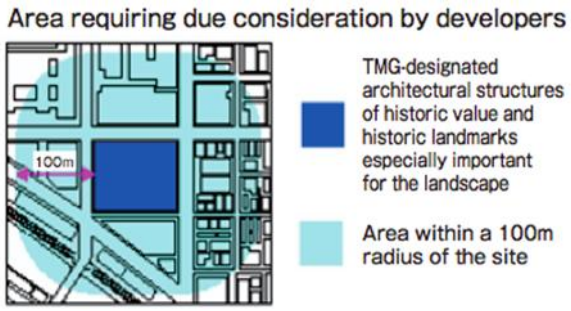


Figure 1.4 100 meter boundary around historical structures.[19]

Japanese authorities have a rather liberal approach towards developing new projects. Nevertheless this recently led to strong public participation, which can be seen at Machizukuri, representing a Japanese community development movement relying on voluntary participation. Its overall goal is to protect and preserve historically grown neighborhoods and increase safety and quality of life within these areas.

1.1.5 Promotion of preservation in Japan

According to the Law for the Protection of Cultural Properties a designation of historic structures can be approved by the Ministry of Education, Culture, Sports, Science and Technology, which may provide technical and financial support in order to preserve and maintain the designated structure. The Ministry requests through investigation regarding particular historic buildings or building complexes. The Council for Cultural Affairs, by installing an Investigative Commission carries out inquiries. After the council hands in a final report a decision based on research findings is taken by the Ministry and may result in designation of the structure. In order to be selected as “object of selection” an architectural or civil engineering structure is to present certain characteristics. [20]

- Built 50 years or more ago
- Contributing to national historic landscape
- A model of formative art
- Not readily reproducible

[19] Urban Development in Tokyo, Bureau of Urban Development TMG, 2011, page 21

[20] Conservation and Repair Projects: Their Systems and Project Planning, Nobuo Kamei, 2009, Page 8

Figure 1.5 Process of Designation, Registration ad Selection of Cultural Properties. [21]

In accordance with the Law for the Protection of Cultural Properties any alteration of Designated Cultural Property has to be permitted by the Commissioner for Cultural Affairs, also maintenance work is frequently requested. Repair work is to be carried out by the owner of any designated cultural property, technical and financial support may be provided by the government. If subsidy is granted usually guidance regarding supervision and design by the national and/or prefectural government is provided, approved design supervisor has to be commissioned by the Cultural Agency. The role of the appointed design supervisor permanently stationed on site thereby is to advise the owner.

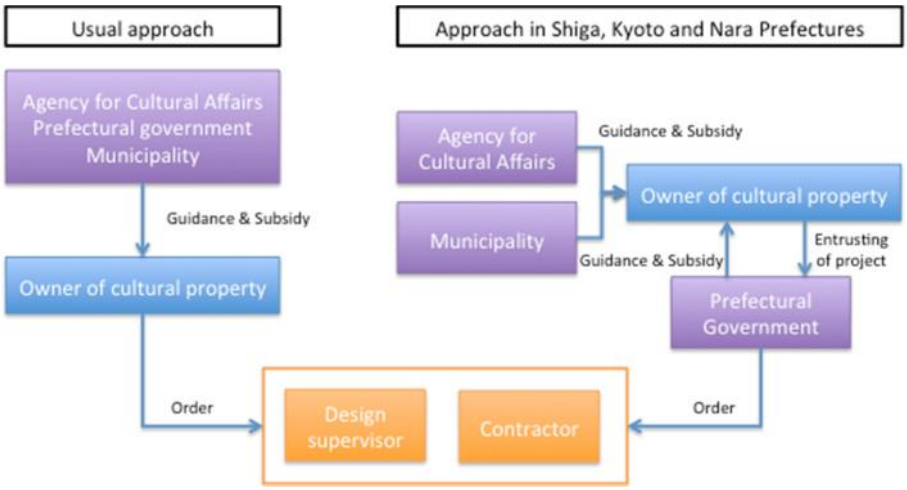


Figure 1.6 System for conservation and repair projects. [22]

There are two different systems for guidance and subsidy. Usually governmental entities grant subsidy in correspondence to each other and directly communicate with the owner. However in prefectures with high cultural importance, particularly Shiga, Kyoto and Nara Prefectures, use a different scheme, in which each entity independently offers guidance

[21] Preservation and Utilization of Cultural Properties, MEXT, 2012, Page 35

[22] Own Figure, Source: Conservation and Repair Projects: Their Systems and Project Planning, Nobuo Kamei, 2009, Page 17

and subsidy. Additionally the prefectural government usually orders and supervises repair work.

In order to promote Cultural Property and making it visible to the public a campaign was started in 1966 resulting in the creation of a “Protection of Cultural Properties” logo based on the pattern of a *Tokyo* – a wooden joint usually placed on top of a pillar.

Figure 1.7 “Protection of Cultural Properties” Logo. [23]

Regulating protection of historically important structures and establishing legal framework for authorities in order to enhance preservation the Law for the Protection of Cultural Properties became insufficient to combine modern urban planning needs and heritage protection so adjustment was necessary. Noticeable amendments have been passed in 1975 and 1996. Due to an increasing number of urban development projects it was necessary to prevent historic settlements from partial or full destruction. To mitigate the impact of urban development the amendment of 1975 included Groups of Historic Buildings, Preservation Districts for Groups of Historic Buildings and Important Preservation Districts for Groups of Historic Buildings. To be recognized as a Preservation District one of three following requirements have to be fulfilled. [24]

- The group of historic buildings is of outstanding overall design.
- The group of historic buildings, and the grounds on which it is situated favourably retain their original state.
- The group of historic buildings and its surrounding environment markedly demonstrate regional characteristics.

As an effective respond tool was still missing, this was finally included in the 1996 amendment providing the Minister of Education, Culture, Sports, Science and Technology with efficient instruments. Now the Ministry is enabled to register Cultural Property, in particular need of preservation. They are also to prevent structures from demolition without adequate identification and evaluation of their cultural value.

[23] Preservation and Utilization of Cultural Properties, MEXT, 2012, Page 38

[24] Conservation and Repair Projects: Their Systems and Project Planning, Nobuo Kamei, 2009, Page 10

1.1.6 Economic Impact of Preservation

In recent years growing interest in economic aspects of historic preservation caused by a vast amount of aging structures in developed countries could be observed. The complex decision-taking-process for building in existing environments requires detailed information regarding technical and social aspects. Therefore deeper understanding of economic advantages of preservation is essential. In order to generate such an understanding it is necessary to obtain and maintain data from executed projects. The data allow planners to establish estimating schemes evaluating advantages of future projects. Consequently several factors have to be considered. Currently there are several programs obtaining such data in order to measure the economic impact of historic preservation. The US Main Street Program and the European Livable Cities Project are to be mentioned. Most programs make use of five basic factors for calculating economic impact of preservation.[25]

- Jobs
- Property values
- Heritage tourism
- Environmental measurements
- Downtown revitalization

However there exists no standardized methodology to define these factors. Data inquiry is carried out differently with each of the programs. Outcome Results depend on diverse requirements of different programs and various types of structures dealt with.

1.2 Conceptual Design for existing structures

Four different types of conceptual design for existing structures are to be determined. Each design type is defined by two factors, cultural importance and possibility of adaptation. Cultural importance includes historic and architectural criteria. Possibility of adaption considers technical and economic criteria.

- Type I: Tearing down existing structure and replacing it by a new construction
- Type II: Restoring and preserving original design
- Type III: Rebuilding and modernizing inner structure, exterior structure is maintained in its original design

[25] Measuring Economic Impacts of Historic Preservation, Rypkema and Cheong, 2011

- Type IV: A symbiosis between Type II and Type III, existing structure is partly preserved and modern structure integrated

By determining four different types a two-dimensional diagram regarding conceptual design can be created. In Figure 1.4 the four basic types are being categorized according to cultural importance and possibility of adaption.

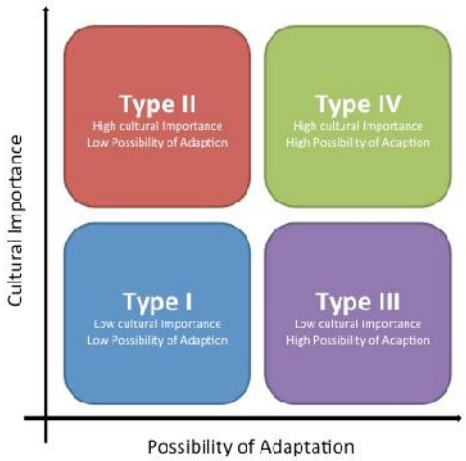


Figure 1.8 Conceptual Design for existing structures.

The diagram display the complexity of decision taking in a project with existing structure. Who defines what is culturally important and which economic conditions would be beneficial for modernizing existing structures? Only technical feasibility of preservation or modernization and/or public interest in preserving a particular structure does not imply that it will be preserved.

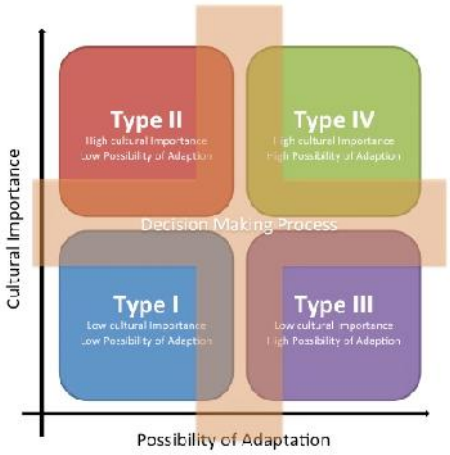


Figure 1.9 Conceptual Design for existing structures and the problem of definition.

Private investors are subject to market rules and follow a rational approach, while governments are able to invest reasoned by cultural importance but often suffering from notorious budgetary constraints. This is why it is of importance to enhance a decision-making process favoring preservation by means of legal support on a national and international level. In many cases compromise has to be reached and partial restoration is often the only way to save structures, which does not automatically indicate a demerit, merging the past, present and future can create something entirely new, able to outstand its former appearance.

1.2.1 Examples for conceptual design types

Twenty different cases from the US, EU, Australia and Japan have been selected to display different conceptual design types.

Table 1.1 Examples for conceptual design types

Structure	Location
Federal Building	Chicago
Fort Macquarie Tram Depot	Sydney
Hongokan	Tokyo
Imperial Hotel	Tokyo
Wien Hauptbahnhof	Vienna
Toshogu Shrine	Nikko
Notre Dam de Paris	Paris
Pantheon	Rome
St. Peter's Basilica	Rome
Himeji Castle	Himeji
Elbe Philharmonic Hall	Hamburg
Japan Central Post Office	Tokyo
Mitsubishi Ichigokan	Tokyo
National Diet Building	Tokyo
Galleria Vittorio Emanuele II	Milan
Louvre	Paris
Museumsquartier	Vienna
Reichstag	Berlin
Tokyo Station	Tokyo
Sofiensaal	Vienna

In order to map these cases on the diagram regarding conceptual design types a questionnaire with a brief historical introduction of each building was handed out (See Appendix). Four basic question were asked:

1. Do you think this building is of historical or architectural importance?

2. Do you think this building is an outstanding structure?
3. Do you think this building is adaptable to modern use?
4. Do you think it is economically feasible to preserve or modernize this building?

Heritage policy is highly considered and influenced by public opinion. Individuals develop emotional relationship towards historic structures often resulting in the general opinion that implies a strong interest in future plans functioning as forceful trigger in a decisionmaking process. Public support often is regarded vital for preservation projects.

Questionnaire results (See Appendix) are to be valued as common opinion not as expert statement.

1.2.2 Examples displayed on the diagram

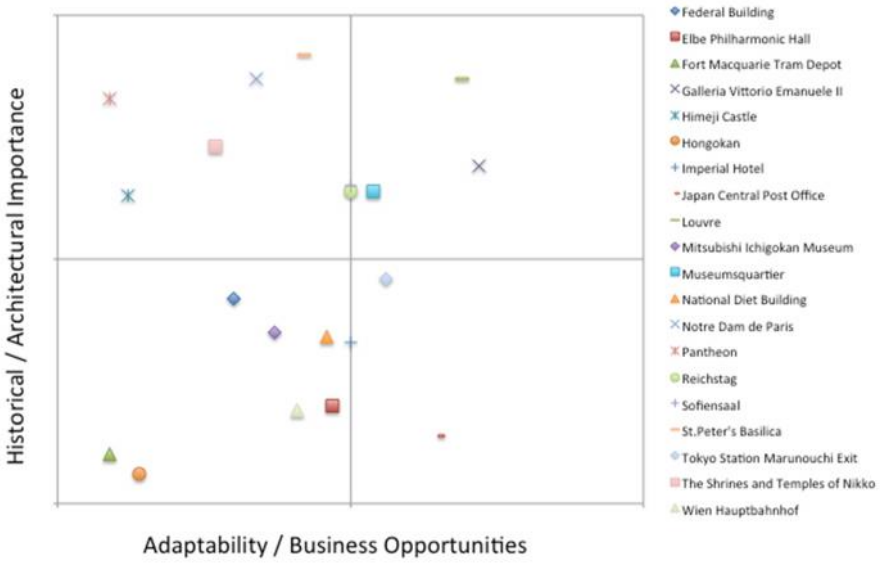


Figure 1.10 Mapping of accumulated data.

The mean value of data obtained for each example was calculated and positioned on the diagram. The result is shown in Figure 1.7. A quality distinction between Type II and Type IV can be recognized. However, clear distinction between Type I and Type III is not quantitatively determined. In order to group them for both parameters a minimum range was fixed. The range cultural importance was valued higher than the range of business opportunities, caused by limited know-how of individuals questioned. Based on evaluation an additional cluster analysis was carried out. Four clusters were established:

- Asian background participants
- Non-Asian background participants

- Participants with engineering background
- Participants with non-engineering background

Results of this cluster analysis are displayed in Figure 1.6.

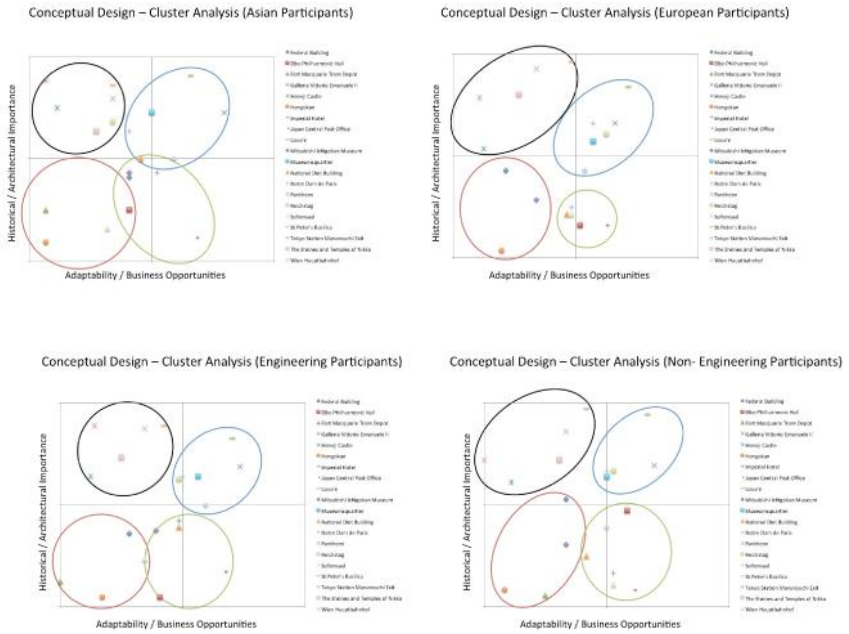


Figure 1.11 Cluster Analysis of accumulated data.

Several notable changes of position of examples could be determined by cluster analysis. While Type II and Type IV examples only slightly change their value, clear distinction of Type I and III examples was not possible. To accomplish a more precise statement also deviation and variance were calculated.

Table 1.2 Results of Cluster Analysis

		Variance		Types				
#	Structure	CI	BO	Data	Asian	Non-Asian	Engineers	Non-Engineers
1	Federal Building	0.008	0.019	Type I	Type I	Type I	Type I	Type II
2	Elbe Philharmonic Hall	0.037	0.009	Type III	Type I	Type III	Type III	Type I
3	Fort Macquarie Tram Depot	0.037	0.046	Type I	Type I	Type I	Type I	Type I
4	Galleria Vittorio Emanuele II	0.003	0.010	Type IV	Type IV	Type IV	Type IV	Type IV
5	Himeji Castle	0.037	0.000	Type II	Type II	Type II	Type II	Type II
6	Hongokan	0.016	0.012	Type I	Type I	Type I	Type I	Type I
7	Imperial Hotel	0.041	0.005	Type III	Type III	Type III	Type III	Type III
8	Japan Central Post Office	0.001	0.013	Type III	Type III	Type III	Type III	Type III
9	Louvre	0.009	0.002	Type IV	Type IV	Type IV	Type IV	Type IV
10	Mitsubishi Ichigokan	0.013	0.003	Type I	Type I	Type I	Type I	Type I
11	Museumsquartier	0.013	0.008	Type IV	Type IV	Type IV	Type IV	Type IV
12	National Diet Building	0.052	0.021	Type III	Type IV	Type III	Type III	Type I
13	Notre Dame de Paris	0.009	0.005	Type II	Type II	Type II	Type II	Type II

14	Pantheon	0.013	0.006	Type II	Type II	Type II	Type II	Type II
15	Reichstag	0.012	0.042	Type IV	Type II	Type IV	Type IV	Type IV
16	Sofiensaal	0.001	0.023	Type IV	Type II	Type IV	Type IV	Type IV
17	St. Peter Basilica	0.009	0.011	Type II	Type II	Type IV	Type II	Type IV
18	Tokyo Station	0.023	0.019	Type III	Type IV	Type III	Type IV	Type III
19	The Shrines of Nikko	0.014	0.000	Type II	Type II	Type II	Type II	Type II
20	Wien Hauptbahnhof	0.016	0.015	Type I	Type I	Type III	Type I	Type III

Greatest variance occurred among politically related structures. It was apparent that most notable variations appeared among Type I and Type III structures, concluding that values of these structures are close to range limits and that decision making process for Type I and Type III appears to be more diverse and complex.

1.2.3 Conclusion

Given the fact that personal background strongly influences individual opinion towards existing structures, public opinion can be considered as a crucial factor for decision-making-process, especially with delicate objects, such as politically significant buildings. History and individual biography develop emotional relationship with surrounding architectural landscape. We grow up among existing architecture and frequently identify events of our past by symbols such as buildings. It is a difficult task to decide the fate of particular structures; which building should be preserved, which should be torn down, can it be modernized, is it feasible, is it necessary? Questions that have to be answered for each project; always cautious approach is needed. Poor handling can cause dissatisfaction in the public, as could be seen in Istanbul, Turkey, where new projects threatened the historic inner city and caused massive riots; or in Paris, France, where the demolition of Les Halles led to social tensions and finally to an escalation of protests. Regarding the four types of conceptual design we can say that there is general agreement to protect existing buildings for structures with high cultural value (type II and IV). However less agreed upon buildings (type I and III) are often high valued among a specific group and have to be dealt with care as well.

2 Japanese Construction Industry

The Japanese construction industry with its approximately 10 percent share of Japan's GDP and workforce represents a key industry in Japan and is considered one of the most extensive construction industries in the world. In 2012 5.05 million were employed with estimated total investment of ¥ 44,900 billion[26].

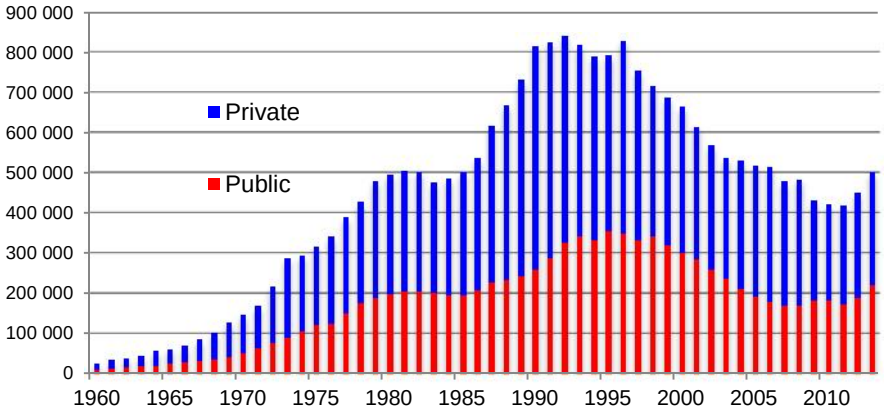


Figure 2.1 Investment in Japanese Construction Industry (in 100-million Yen).[27]

In terms of infrastructure built Japan has a stock value of 179 %[28] of GDP in 2012, representing the highest worldwide, indicating oversaturation of the Japanese construction market. Since its peak in 1990 construction industry is dealing with a constantly shrinking domestic market. Recent development showed that the industry was able to generate growth, this was however caused by reconstruction after the Great East Japan Earthquake in 2011. Due to the organizing Olympic Games in Tokyo 2020 this development is predicted to be continued. Nevertheless industry is suffering from several severe organizational and strategic problems and current growth trends might just indicate short-term growth. If efforts to change organization and to strengthen overseas business are not enhanced the industry will have to take drastic measures in order to remain competitive.

Despite negative outlook for Japanese construction industry several Japanese contractors are found among the biggest worldwide. According to the ENR ranking of top global contractors in 2013 five Japanese contractors are among the top 50 and ten more are top level. Revenue is

[26] Statistical Handbook Japan, Statistics Bureau, MIC, 2013 Page 76

[27] Own figure, Source: MLIT

[28] HIS Global Insight; Global Water Intelligence; International Transport Forum; Organization for Economic Co-operation and Development (OECD); OECD's perpetual inventory method; McKinsey Global Institute analysis

largely generated on the domestic market. Revenue overseas hardly exceed 20 %. This is often criticized and due to strong dependence on a prosperous domestic market.

Table 2.1 Japanese contractors in the ENR global ranking 2013[29]

Rank 2013	Firm	Total Revenue 2012 in Mio $	Overseas Revenue 2012 in Mio $	Overseas share
17	Obayashi Corp.	15,598.0	2,557.0	16.4%
20	Kajima Corp.	14,156.4	2,352.1	16.6%
22	Shimizu Corp.	13,507.4	1,500.9	11.1%
23	Taisei Corp.	13,336.0	1,295.0	9.7%
31	Takenaka Corp.	10,588.0	1,413.0	13.3%

Further major companies are Toda Corp (60), Kinden Corp. (62), JGC Corp (64), Penta-Ocean Construction Co. Ltd. (79), Maeda Corp. (85), Chiyoda Corp. (102), Sumitomo Mitsui Construction Co. Ltd. (107), Toyo Engineering Corp. (112), Nishimatsu Construction Co. Ltd. (113), and Taikisha Ltd. (119).[30]

2.1 Notable Organizations

Several notable organizations supporting activities of Japanese contractors and civil engineers exist in Japan, some are briefly introduced in this chapter.

2.1.1 Japanese Society of Civil Engineers

Japan Society of Civil Engineers (JSCE) was established as an incorporate association with the purpose of strengthening and promoting scientific culture within civil engineering activities in 1914. Soon after its founding members grew in number and JSCE extended its goals. Nowadays the organization has more than 39,000[31] members and is engaged in various fields. Current priorities of JSCE are

- proposing an idea for social infrastructure development
- acquiring mutual trust with society

[29] http://enr.construction.com/toplists/Top-Global-Contractors/001-100.asp on Jun. 26th 2014

[30] http://enr.construction.com/toplists/Top-Global-Contractors/001-100.asp on Jun. 26th 2014

[31] http://www.jsce-int.org/about on Jun. 26h 2014

- promoting scientific and technological research
- evaluating public works

Furthermore JSCE increased its efforts to establish collaborative and transparent environment for civil engineering based research and is also currently working on a Civil Engineering Qualification System. JSCE is publishing a monthly magazine called “Civil Engineer” and a monthly Journal, as well as books and research papers. Publications mostly refer to recent research, trends and statistics of construction industry. JSCE also operates a civil engineering library with approximately 30,000[32] books. Additionally awards are given for research in the field of civil engineering.[33]

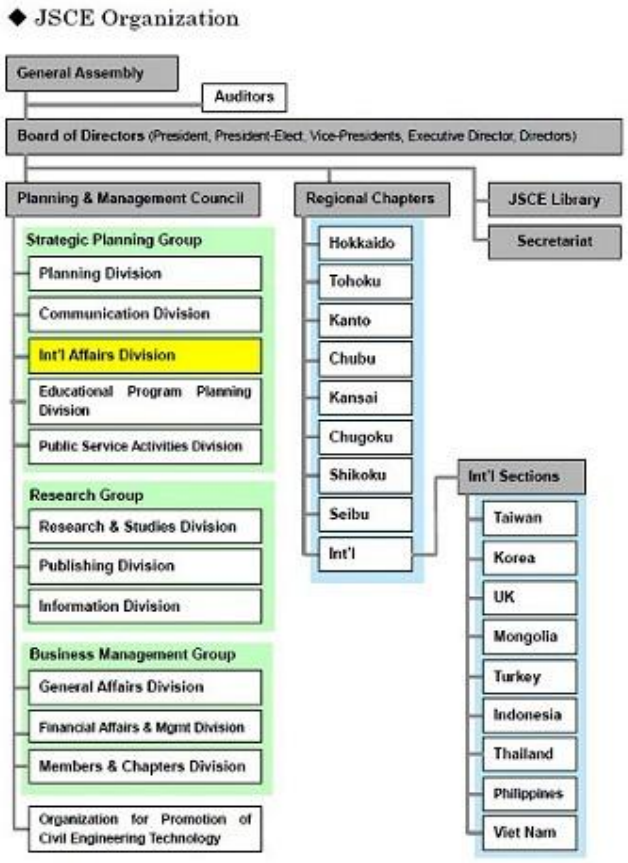


Figure 2.2 JSCE Organization.[34]

[32] http://www.jsce-int.org/about on Jun. 26h 2014

[33] http://www.jsce-int.org/about on Jun. 26h 2014

[34] http://www.jsce-int.org/node/267 on Jun. 26h 2014

Figure 2.2 displays JSCE organization. Over the years JSCE established several overseas offices, located in countries in which Japanese contractors were able to develop successful local branch offices. Furthermore JSCE established several standing and temporary committees for research, training, planning, publications, communication, international affairs, and so on.

2.1.2 The Overseas Construction Association of Japan

The Overseas Construction Association of Japan (OCAJI) was founded in 1955 with the objective to strengthen international activities by Japanese contractors. Today OCAJI consists of 49 member companies and 26 associate member companies and relies on a well-functioning network of overseas branches, international financial organizations, domestic and foreign ministries and organizations like JICA. This allows OCAJI to provide its members with detailed information about overseas markets helping them to establish international offices. OCAJI also was able to establish a comprehensive database of overseas contracts awarded to Japanese contractors. Information obtained by OCAJI is used to carry out research and to offer training programs for its members. OCAJI publishes an annual report of Japan's construction industry is overseas activities and a future outlook. [35]

[35] http://www.ocaji.or.jp/en/about/index.php on Jun. 26th 2014

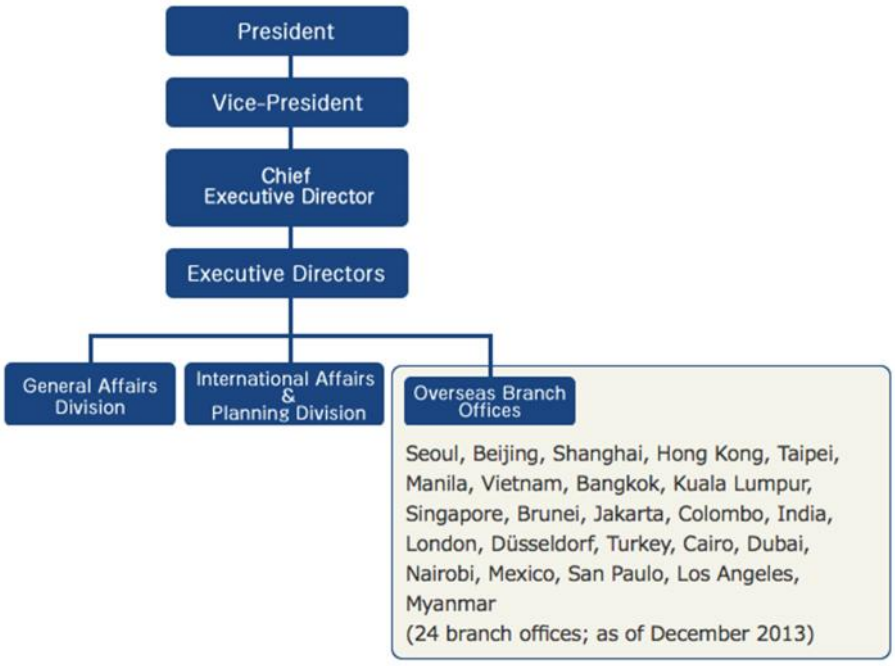


Figure 2.3 OCAJI Organization.[36]

Figure 2.3 shows OCAJI organization. Additionally there exist five standing committees including General Affairs, Investigation and Research, Training, International-cooperation, and Public-relations Committee. A number of Subcommittees and Study Groups are integrated into these committees.

2.1.3 Japan Construction Information Center

The Japan Construction Information Center (JACIC) was established by the former Ministry of Construction, nowadays MLIT, in 1985. In 2012 it was changed into a non-profit general incorporate foundation. JACIC's main goal is to promote information sharing. Thus JACIC is providing information, especially standardised documents for facilities life cycle in digital form. Intended to improve the industry's efficiency and quality. JACIC's efforts contribute to rationalizing tender and contract process, as well as increased transparency. JACIC also conducts development of electronic bidding for public and private sector. Five objectives to further increased efficiency were defined after its organizational change. [37]

- Standardization of construction information

[36] http://www.ocaji.or.jp/en/about/organization.php on Jun. 26th 2014

[37] General Incorporated Foundation, JACIC, 2012, Page 1

- Research and development of information systems
- Environmental preservation by means of recycling
- Promotion and support of arts and science
- Promotion of international cooperation

JACIC executes several research projects in accordance with its objectives. Notable achievements of these studies are: [38]

- Research on the function and information service of a public works cost estimation system
- Research on disaster prevention GIS
- Research on CAD data exchange standard format
- Survey in U.S. on meta-data registry technology for data standard
- Research on availability of IC tag technology in construction
- Development of manuals about quality management of construction work by using ICT
- Research on utilization of construction work member chart database for quality control
- Research on quality control of public works by means of information
- Study on ICT application to asset management
- Study on service to store and manage e-delivered data

JACIC Research Grant Program represents another potent tool to enhance digital based studies for construction industry. The maximum grant amount for free subjects is ¥ 1.5 million [39] and for designated subjects ¥ 2.5 million[40].

To promote JACIC's activities several magazines and journals are published frequently.

[38] General Incorporated Foundation, JACIC, 2012, Page 5

[39] General Incorporated Foundation, JACIC, 2012, Page 7

[40] General Incorporated Foundation, JACIC, 2012, Page 7

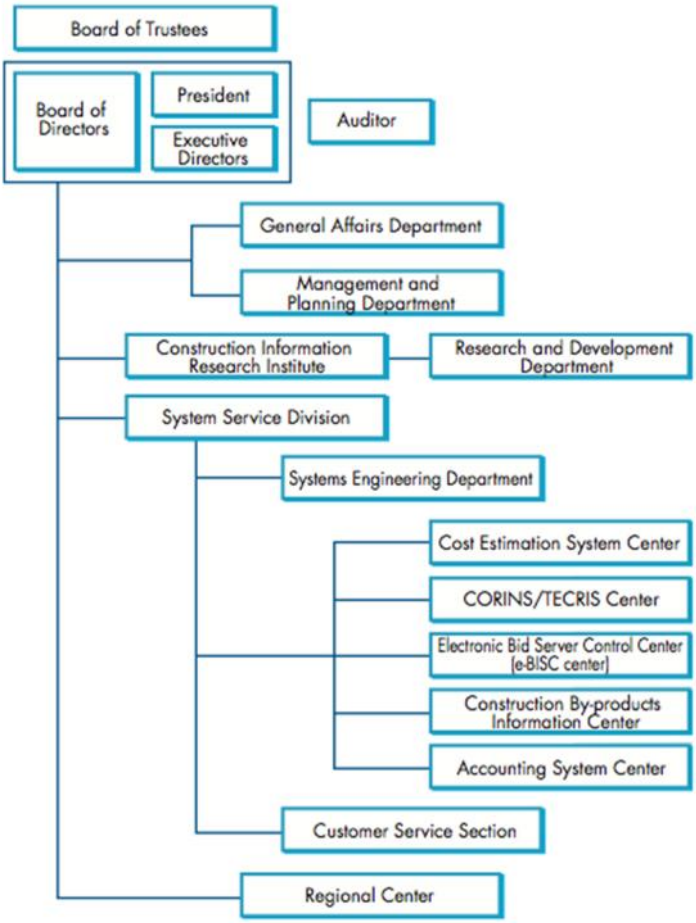


Figure 2.4 JACIC Organization. [41]

Figure 2.2 shows JACIC organization. Representatives of MLIT, research institutes and the industry are usually appointed to the Board of Directors. The organization has several local offices located in major Japanese cities.

2.2 Japanese Contractor

Japan has opened itself to foreign competitors. However, a formidable environment for foreign companies in the construction industry was not developed by the government, resulting in a market domination by a few domestic contractors. These contractors have traditionally strong bonds with the government and major private developers. These contractors formed joint ventures in order to collaboratively share the domestic

[41] General Incorporated Foundation, JACIC, 2012, Page 26

market. This movement is in accordance with the Japanese philosophy of “giri”, favouring a harmonic coexistence of several existing parties and not interfering with each other’s strategy. In a harmonic coexistence they could evolve into large firms with a strong interdependency. Thereby the biggest five contractors, Obayashi, Kajima, Shimizu, Taisei and Takenaka, are traditionally referred to “Super General Contractor”. See description below.

2.2.1 Obayashi Corp.

Founded in 1892 in Osaka by Yoshigoro Obayashi the company could soon acquire several major construction projects. The company made its breakthrough with the construction of Tokyo Station, which stood the Great Kanto Earthquake undamaged. This reputation functioned as a trigger enabling Obayashi to expand business. Nowadays the company consists of a conglomerate of 86 subsidiaries and 26 affiliated companies with more than 13,000[42] employees (shown in Figure 2.3) and a turnover of more than ¥ 1,4 trillion[43] (shown in Figure 2.3) in 2013. The building construction sector can be considered as the company’s main business field. Obayashi in 2012 announced its three-year strategy to extend business fields, mainly investment in real-estate sector and overseas business should be strengthened.

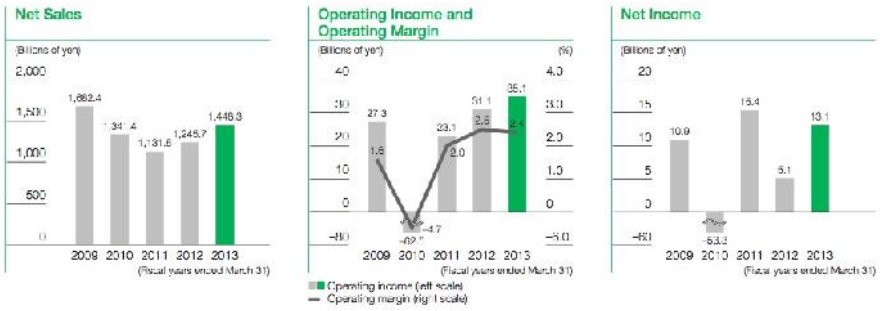


Figure 2.5 Obayashi Corp. Net Sales, Operating & Net Income and Employees.[44]

2.2.2 Kajima Corp.

Kajima Corporation was founded in 1840 as a carpentry business. Soon after Japan’s opening the company moved to Yokohama and extended business. The company made its breakthrough in late Meiji era at

[42] Obayashi Corp. Annual Report 2013, Page 4

[43] Obayashi Corp. Annual Report 2013, Page 4

[44] Obayashi Corp. Annual Report 2013, Page 4

beginning of the 20th century. Kajima faced a severe crisis after World War II but could overcome it due to contracts awarded by the occupation forces. Gradually Kajima became one of Japan's largest contractors with over 15,400[45] employees and a turnover of more than ¥ 1.5 trillion[46] in 2013. The company makes 50%[47] of its turnover in the construction sector. In recent years Kajima was involved in several major preservation projects. It is also well known for its self-developed demolishing method, which enables recycling of more than 90 % of used materials. The company's headquarter is located in Minato, Tokyo.

Figure 2.6 Kajima Corp. Net Sales, Operating & Net Income and Employees.[48]

2.2.3 Shimizu Corp.

Shimizu Corporation history began, similar to Kajima, as a carpentry business in 1804. During economic rise during Meiji era Shimizu could evolve to one of Japan's biggest contractors. Today Shimizu employs more than 15,600[49] with a turnover of approximately ¥ 1.4 trillion[50] in 2013. Shimizu mainly operates in Tokyo area, and generates more than 70 %[51] of its turnover on the construction sector. Governmental and commercial buildings make up the largest share. The company's headquarter is located in Chuo-ku, Tokyo.

[45] Kajima Corp. Annual Report 2013, Page 21

[46] Kajima Corp. Annual Report 2013, Page 21

[47] Kajima Corp. Annual Report 2013, Page 22

[48] Kajima Corp. Annual Report 2013, Page 20

[49] Shimizu Corp. Annual Report 2013, Page 65

[50] Shimizu Corp. Annual Report 2013, Page 25

[51] Shimizu Corp. Annual Report 2013, Page 25

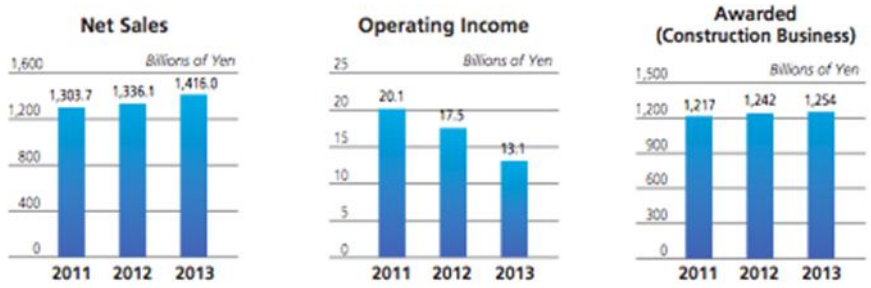


Figure 2.7 Shimizu Corp. Net Sales, Income and New Orders.[52]

2.2.4 Taisei Corp.

Founded in 1873 the company benefitted from the economic boost caused by industrialization during Meiji era. It earned its reputation for installing Arc Lights in Ginza, the first electrical streetlights in Japan. Today Taisei is one of the biggest contractors and generated approximately ¥ 1.4 trillion[53] and employed more than 13,500[54] in 2012. Taisei's biggest business fields are building construction (over 64 % share) [55] and Civil engineering (over 25 % share) [56]. The company is well known for its leading edge technology. One of its latest achievements is a system for constructing Immersed Tunnels, executed at the construction of underground railway line underneath Bosporus Strait. The company's headquarter is located in Shinjuku, Tokyo.

[52] Shimizu Corp. Annual Report 2013, Page 25

[53] Taisei Corp. Annual Report 2013, Page 4

[54] Taisei Corp. Annual Report 2013, Page 4

[55] Taisei Corp. Annual Report 2013, Page 7

[56] Taisei Corp. Annual Report 2013, Page 7

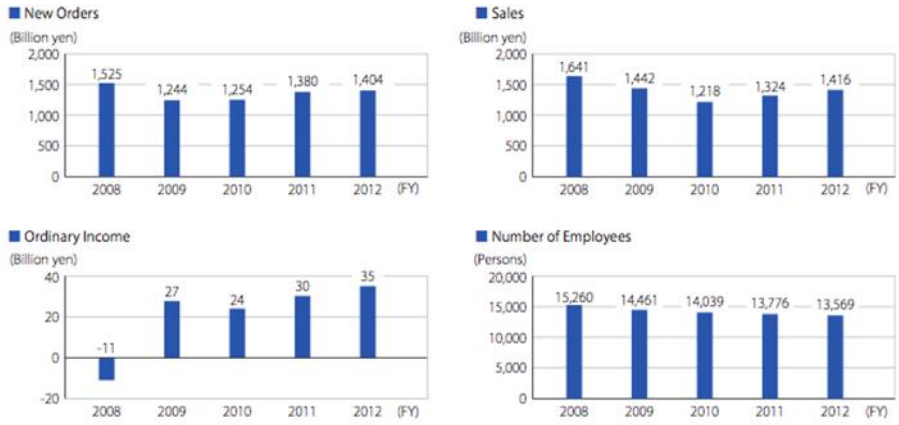


Figure 2.8 Taisei Corp. New Orders, Sales, Ordinary Income & Employees.[57]

2.2.5 Takenaka Corp.

Takenaka is by far the oldest company among Japan's biggest contractors. Founded in 1610 as carpenter business it soon started to construct major buildings for the Oda family, which became Takenaka's patron. Today the company has more than 7,300[58] employees and could generate a turnover of over ¥ 1.0 trillion[59] in 2013. Takenaka maintains one of the largest R&D facilities in construction industry and operates a large design branch. The company's headquarter is located in Osaka.

2.3 Civil engineering related laws

After WW II the Allies concluded that Japan needed a new constitution. This new constitution was commissioned by US General MacArthur and largely written by American advisors. Although Japanese demands were taken into account this led to an American influenced text. Furthermore due to invitation of foreign experts during the Meiji era Japanese Codes appear to be influenced by French and German codes. In Japan law is considered to have a rather limited function. Throughout Japan's cultural background society functions on a common understanding of needs. Harmonic coexistence is favoured. Historically Japanese companies have negotiated conflicts behind closed doors. However the government and companies have become global players and show increased interest to be recognized as such. Therefore Japan started to revalue its legal

[57] Taisei Corp. Annual Report 2013, Page 4

[58] http://www.takenaka.co.jp/takenaka_e/about/profile/, on April 4th, 2014

[59] http://www.takenaka.co.jp/takenaka_e/about/profile/, on April 4th, 2014

system and recent trends show that companies started to take to court more often. Nevertheless the legal system can still be considered more in an institutional context. Especially the Construction Industry is committed to operate in a collaborative environment. This harmonizes with the Japanese philosophy of "giri" [60], a philosophy which emphasizes obligations and duties of the individual with respect to society.

Basic Civil Engineering Laws are: [61]

- Civil Code, Articles 632 through 642 (Law No. 89, 1896) regarding the "Contract for Works" (Ukeoi-Keiyaku)
- Commercial Code (Law No. 49, 1899) dealing with commercial transactions
- Construction Business Law (Law No. 100, 1949) covering construction business, the contractual requirements and its licenses;
- Public Accounting Law (Law No. 35, 1947) including bidding requirements for public construction projects
- Building Standards Law (Law No. 201, 1950)
- Order concerning Budget, Settlement of Account and Accounting (Government Order No. 165, 1947) prohibiting undue restraints of trade and unfair business practices

Japanese construction law promotes two particular effects. The first is that the Owner/Employer also sees himself in the position of his employee's patron, enhancing good relations between Owner/Employer and hired companies and preventing arising disputes. Upcoming conflicts are dealt with by mutual consulting and understanding each other's needs. Another particularity is the form of contract. Despite the fact that the Japanese Law provides construction industry with several different types of construction contracts that the lump-sum contract represents the most commonly used. Japanese lump-sum contracts include that a substantial amount is paid in advance. In contracts awarded by the government this amount can make up to 40%[62] of the project total price.

There are two types of lump-sum contracts: [63]

- Contract and Standard Conditions of Contract for Construction Works
- Contract and Standard Conditions of Contract of Public Works

[60] Avoiding a Crisis in the Construction Industry, Nielsen, 2006, Page II-4

[61] Avoiding a Crisis in the Construction Industry, Nielsen, 2006, Page II-5

[62] Avoiding a Crisis in the Construction Industry, Nielsen, 2006, Page II-9

[63] Avoiding a Crisis in the Construction Industry, Nielsen, 2006, Page II-7 f.

With Japan's economic rise to global player the government promoted Joint Venture contracts. Therefore the former Ministry of Construction, now MLIT, established two forms. [64]

- Joint Venture or type A, which is consolidated
- Consortium or type B, which is unconsolidated

For the bidding procedure for public projects there are three basic types. Projects with a contract value of ¥ 200 – 730 million[65] are subjects to an Open and Competitive Bidding Procedure. Projects with a contract value of ¥ 100 – 200 million[66] are subject to Interest Registration Designated Competitive Bidding. Each company is requested to hand in a list of preferred projects and the awarding government authorities consider each company's interests. Projects with a contract value of less than ¥ 100 million[67] are subjects to Designated Competitive Bidding. Respective government authority invites preferred companies to bid.

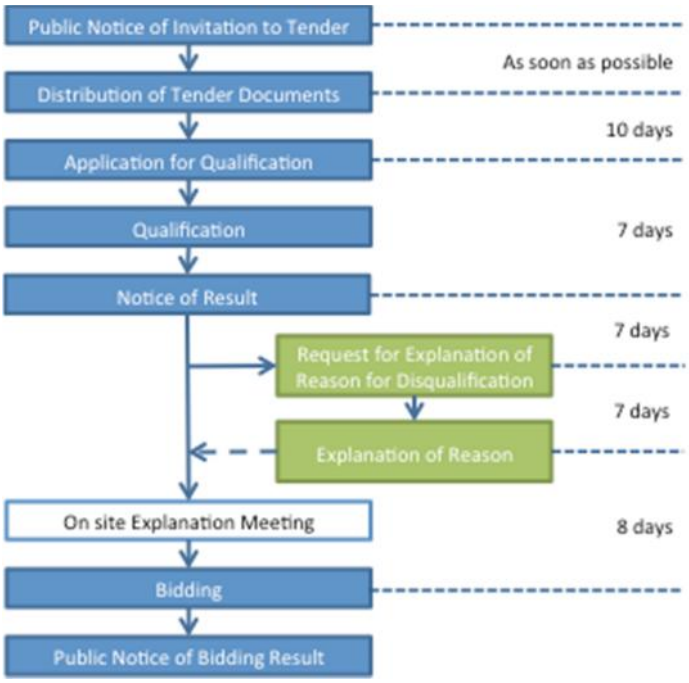


Figure 2.9 Japanese Open and Competitive Bidding Procedure. [68]

In Figure 2.10 the schedule determined by MLIT in terms of Open and Competitive Bidding Procedure is displayed. As soon as Tender

[64] Avoiding a Crisis in the Construction Industry, Nielsen, 2006, Page II-8

[65] Avoiding a Crisis in the Construction Industry, Nielsen, 2006, Page IV-4

[66] Avoiding a Crisis in the Construction Industry, Nielsen, 2006, Page IV-4

[67] Avoiding a Crisis in the Construction Industry, Nielsen, 2006, Page IV-4

[68] Own Figure, Source: Avoiding a Crisis in the Construction Industry, Nielsen, 2006, Page IV-5

Documents have been distributed, companies have ten days to apply for qualification. Awarding governmental entities have to examine the applications within seven days and notify bidding companies. Disqualified companies can request detailed information about reasons for refusal within seven days and will receive an explanation within another seven days. If requested an On-site Explanation Meeting will be held. After another eight days the bidding process finally starts. After a company is finally awarded notification of the result is published.

3 Tokyo and the significance of its railway system

3.1 Tokyo

Located in the estuary of Tokyo Bay Tokyo with its futuristic scenery formed by its various city centres, shining neon lights, pulsating night life, massive railway system, subway network, its highways and its gigantic megalopolis region, it appears as the embodiment of the modern megacity. Tokyo is administrated as metropolitan prefecture, making it one of the 47 prefectures of Japan and divided into 23 wards. Greater Tokyo Area (GTA) consists of four prefectures including large cities such as Chiba, Kawasaki, Yokohama, and Saitama. The National Capital Region consists of eight prefectures and is home to more than a quarter of Japan's population (approximately 36.9 million[69]) and generates more than a third of Japan's GDP (approximately $ 1,875 billion[70]).

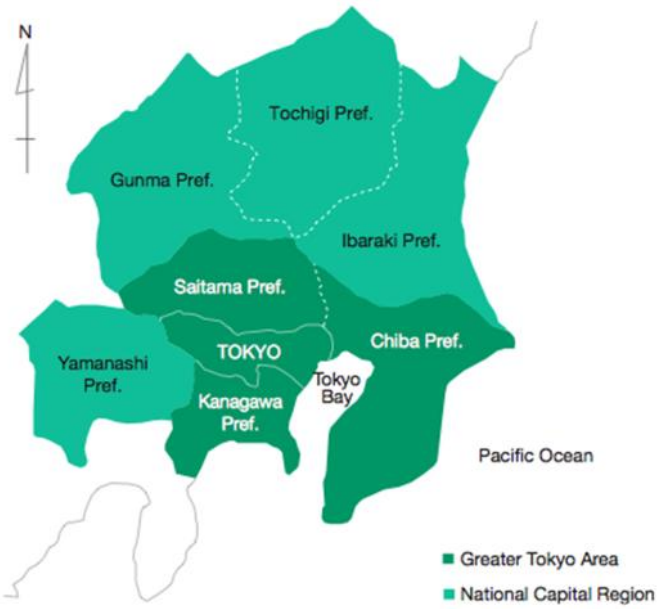


Figure 3.1 Greater Tokyo Area. [71]

[69] Statistical Handbook of Japan, 2013, Page 23, Table 2.10

[70] http://www.foreignpolicy.com/articles/2012/08/13/the_most_dynamic_cities_of_2025, on 10.09.2014

[71] Tokyo – City Profile and Government, TMG, 2014, Page 4

3.1.1 History

Originally a fishing village named Edo, which means “estuary”, Tokyo simply was a rural settlement. Its name was taken from its location at what is now Tokyo Bay. In the 12th century, the Yamahura period, the local landlord recognized its strategic position and built a castle there. Since then Edo constantly expanded. In 1590 Edo gained significant importance as Tokugawa Ieyasu selected it as his headquarter. After his victory at the Battle of Sekigahara in 1600 Tokugawa Ieyasu was appointed Shogun, the military ruler of Japan, and Edo was chosen as capital of newly formed Japan. During the Tokugawa Shogunate Edo flourished and became a pulsating megacity. In 1868 when imperial troops ended the reign of the Tokugawa regime, Emperor Meiji decided to rule Japan from the former Tokugawa castle. The city was renamed Tokyo, that is “eastern capital”. In 1923 the Great Kantō earthquake hit Tokyo, killing at least 70,000, causing extensive damage. Due to fires caused by the earthquake more than 75 % of the city’s infrastructure was severely damaged. Tokyo was rebuilt as a modern city. Former low storey wooden structures were replaced by higher concrete and steel structures, new wide motorways and the first subway were installed. However, Tokyo suffered once more from extensive destruction by air raids during WW II. [72]

3.1.2 Urban Development of Tokyo

In the Meiji era Japan evolved from an isolated feudal state to a modern, industrialized colonial power and Tokyo was its capital. In order to represent Japan as a global player Tokyo was massively expanded and modern technologies such as railway, electrical and communication grid, as well as concrete and steel structures were introduced and even destruction caused by the Great Kanto earthquake and during WW II could not stop Tokyo’s development to one of the world’s largest megacities.

[72] Tokyo – City Profile and Government, TMG, 2014, Page 2

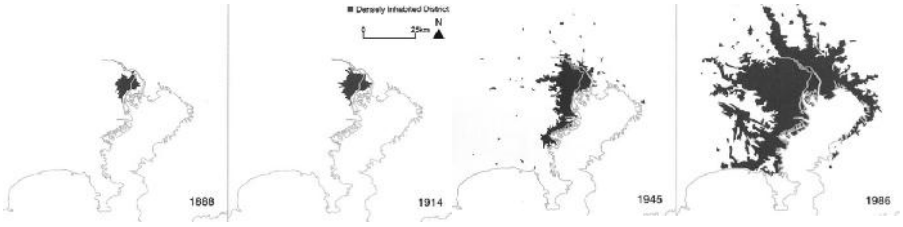


Figure 3.2 Expansion of Urban space in the Tokyo Area. [73]

After destruction in the Great Kantō earthquake Tokyo's urban structure underwent transformation. Authorities soon recognized the possibilities of railway-based urban development, including this into their vision of a new Tokyo. Railway stations were used as central hubs for Tokyo's commercial development, allowing several sub-centres with different aspects to evolve. Urban expansion was carried out alongside the tracks. The railway system so became the veins of Tokyo and the Stations its hearts. For this development in recent years the terminology of transit-oriented came up but at that time it arose out of pure necessity. Nevertheless urban planning was executed and maintained along railway tracks and enhanced after WW II, shaping the structure of the entire metropolitan area.

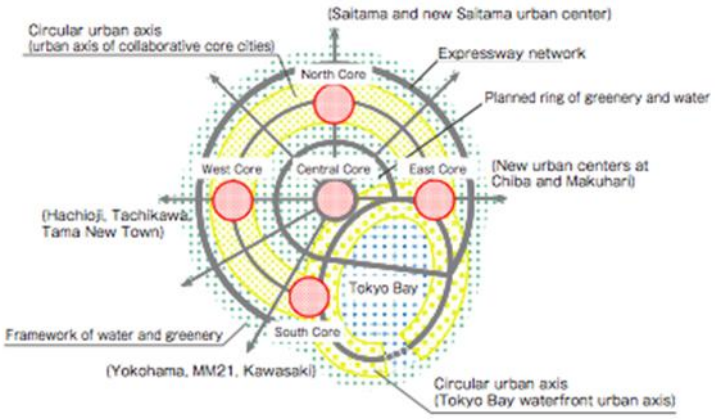


Figure 3.3 City structure of Tokyo. [74]

The railroad and expressway network is a circular structure with main lines connecting Tokyo with surrounding sub-urban areas. Major stations, located at the main intersections of the network, formed city cores, situated in the north, east, west, south, and the city center. In the

[73] Tokyo's Urban Growth, Urban Form and Sustainability, Okata and Murayama, 2011, Page 17

[74] Urban Development in Tokyo, Bureau of Urban Development TMG, 2011, page 3

very heart of central core is the Imperial palace surrounded by several business districts.

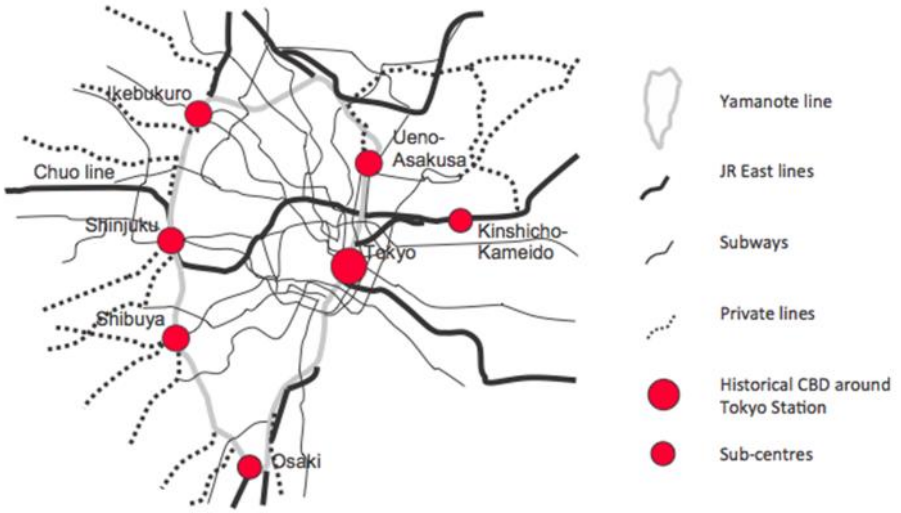


Figure 3.4 Inner city structure of Tokyo. [75]

Figure 3.4 shows the central Tokyo loop line, the Yamanote line. TMG enhanced development around stations along this line, allowing private developers to make use of the social and economic potential of stations, resulting in numerous major urban development projects in the immediate surroundings of these stations, forming several sub-centres.

3.1.3 Population

As of October 1, 2013 Tokyo metropolitan prefecture had an overall population of about 13.29 million[76], approximately 10 %[77] of Japan's total population. Its area is about 2.189 square kilometres[78]. The 23 city wards had a population of 9.06 million[79] and covered an area of 623 square kilometres[80]. In 2012 Tokyo had a net increase of 56,000[81] inhabitants; making Tokyo the fastest growing prefecture of Japan.

[75] Station area developments in Tokyo and what the Randstad can learn from it, Chorus, 2012, page 72

[76] Tokyo – City Profile and Government, TMG, 2014, Page 7

[77] Tokyo – City Profile and Government, TMG, 2014, Page 7

[78] Tokyo – City Profile and Government, TMG, 2014, Page 7

[79] Tokyo – City Profile and Government, TMG, 2014, Page 7

[80] Tokyo – City Profile and Government, TMG, 2014, Page 7

[81] Tokyo – City Profile and Government, TMG, 2014, Page 7

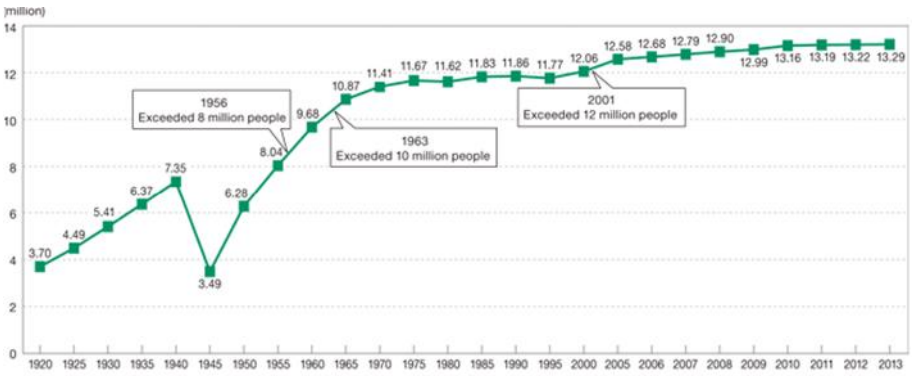


Figure 3.5 Population growth of Tokyo metropolitan prefecture. [82]

Since Japan's economic boom in the 1980's, Japan is experiencing a population decline. On the other hand life expectancy increased, resulting in a low birth rate and a rapidly aging society. In 2010 23 %[83] of Japan's total population was older than 65 years. The percentage of aged persons for an "aged society" according to UN standard is 14 %[84].

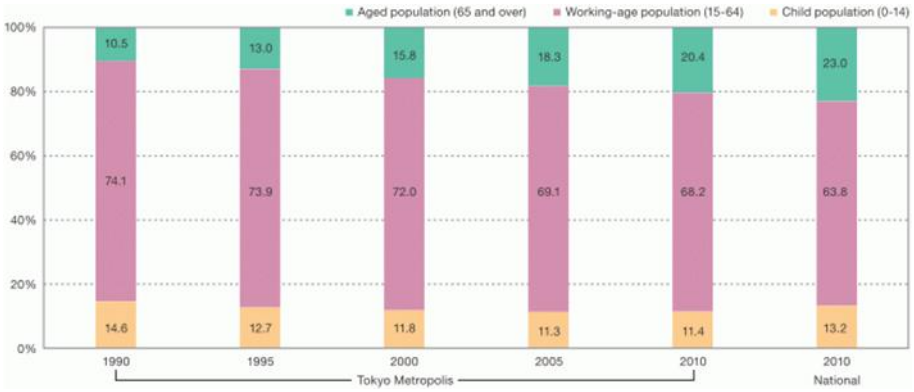


Figure 3.6 Demographic composition of Tokyo metropolitan prefecture. [85]

In 2010 0.4 %[86] were employed in Primary Industry (agriculture, forestry and fisheries), 15.2 %[87] in Secondary Industry (Manufacturing and transportation-related occupations), 70.8 %[88] in Tertiary Industry (sales, services, technical, management and clerical occupations), and 13.7 %[89]

[82] Tokyo – City Profile and Government, TMG, 2014, Page 7

[83] Tokyo – City Profile and Government, TMG, 2014, Page 8

[84] Tokyo – City Profile and Government, TMG, 2014, Page 8

[85] Tokyo – City Profile and Government, TMG, 2014, Page 9

[86] Tokyo – City Profile and Government, TMG, 2014, Page 8

[87] Tokyo – City Profile and Government, TMG, 2014, Page 8

[88] Tokyo – City Profile and Government, TMG, 2014, Page 8

[89] Tokyo – City Profile and Government, TMG, 2014, Page 8

in unclassified fields. Since 2005 unclassified fields are rapidly increasing.

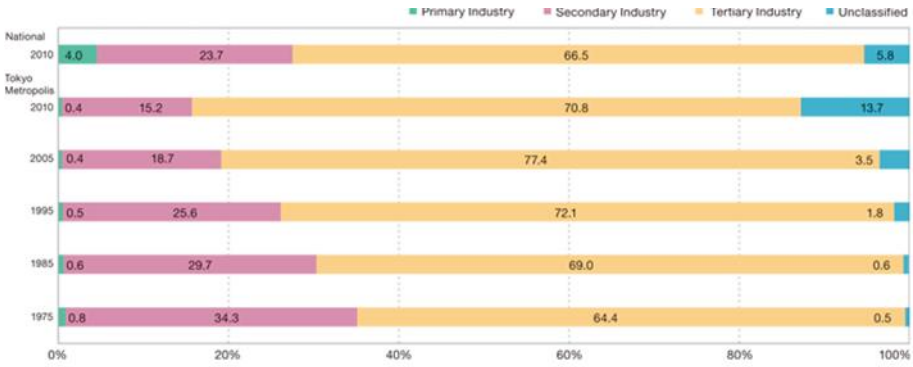


Figure 3.7 Employed persons per industry sector of Tokyo metropolitan prefecture. [90]

3.2 Tokyo railway system

As explained before due to transit-oriented urban development the railway network plays a vital role for Tokyo's urban planning. In terms of trips by transportation mode railway accounts for approximately 30 %[91] within GTA, making railway the biggest transportation mode. The railway network is operated by private companies and the network owned by the eleven biggest operators had a total length of 2,657.6 km[92] in 2013 and generated ticket revenue of about ¥ 1,968.5 billion[93]. In total there are 30 operators running 121 individual rail lines. For smooth and passenger friendly travel operators cooperate.

[90] Tokyo – City Profile and Government, TMG, 2014, Page 10

[91] Annual Report, JR East, 2013, Page 66

[92] Annual Report, JR East, 2013, Page 66

[93] Annual Report, JR East, 2013, Page 66

MAJOR RAILWAYS IN THE TOKYO AREA

	Passenger Line Network[1]		Passenger Kilometers[2]		Revenues from Passenger Tickets[2]	
	km	%	Millions	%	Billions of Yen	%
JR East	**1,106.1**	**41.6%**	**78,599**	**47.8%**	**849.9**	**43.2%**
Tobu Railway	463.3	17.4%	12,172	7.4%	136.7	6.9%
Tokyo Metro	195.1	7.3%	18,375	11.2%	289.3	14.7%
Seibu Railway	176.6	6.7%	8,468	5.2%	92.5	4.7%
Keisei Electric Railway	152.3	5.7%	3,574	2.2%	52.0	2.6%
Toei (Tokyo Metropolitan Government)	131.2	4.9%	6,137	3.7%	125.8	6.4%
Odakyu Electric Railway	120.5	4.5%	11,028	6.7%	113.6	5.8%
Tokyu Corporation	104.9	4.0%	10,177	6.2%	128.1	6.5%
Keihin Electric Express Railway	87.0	3.3%	6,087	3.7%	72.9	3.7%
Keio Electric Railway	84.7	3.2%	7,261	4.4%	76.8	3.9%
Sagami Railway	35.9	1.4%	2,538	1.5%	30.7	1.6%
Total	2,657.6	100.0%	164,416	100.0%	1,968.5	100.0%

Figure 3.8 Major Railways in the Great Tokyo Area. [94]

The position of stations as central hubs for sub-centres led to the development of major business districts along the Yamanote loop, resulting in a massive influx during morning hours and vice versa during evening and explains the daily flow of passengers from adjacent prefectures to Tokyo in Figure 3.8. The high concentration of jobs in the centre leads to very high levels of in-vehicle congestion rates. In 2010 congestion rates of over 166%[95] were observed.

[94] Annual Report, JR East, 2013, Page 66

[95] Urban Rail Development in Tokyo From 2000 to 2010, Kato, 2014, Page 10

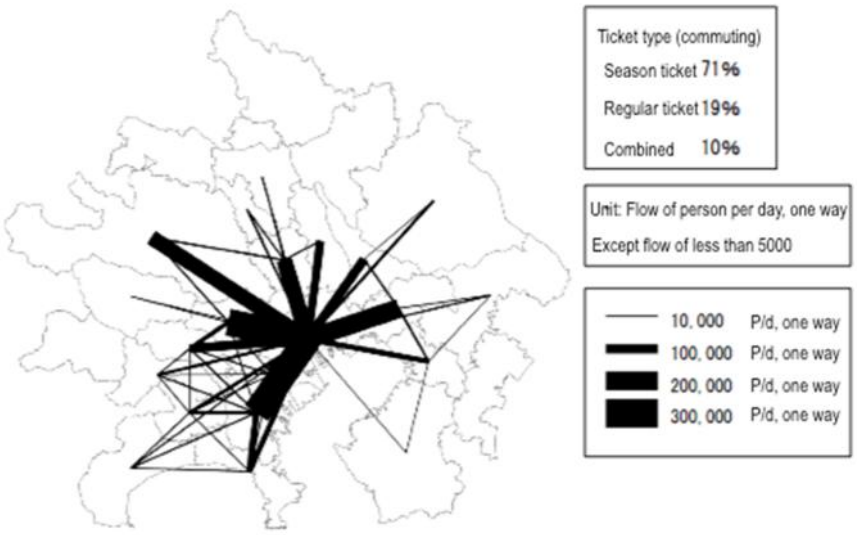


Figure 3.9 Railway commuter flow of in the Greater Tokyo Area. [96]

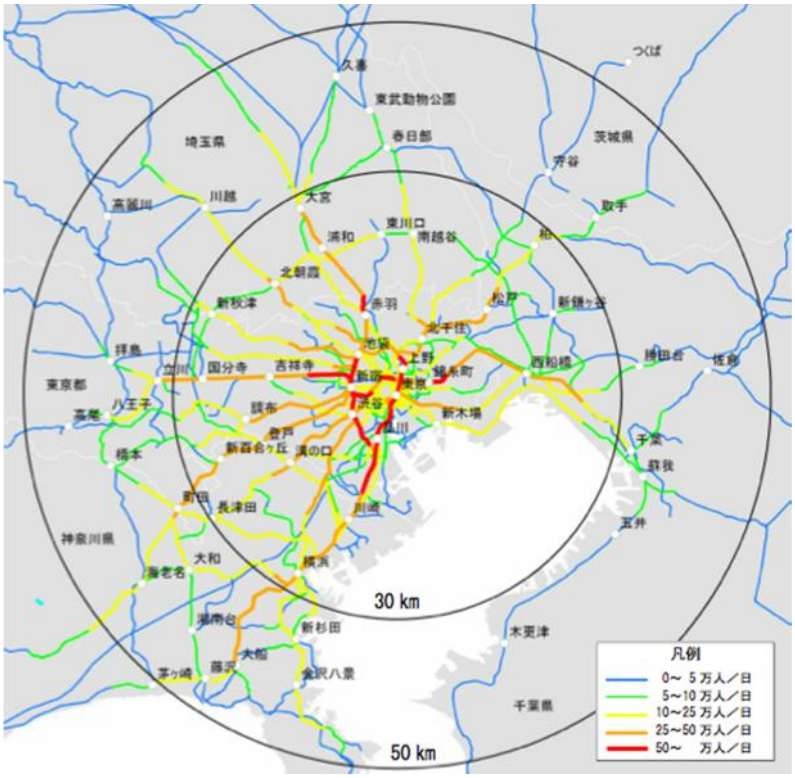


Figure 3.10 Railway passenger flow between stations in Greater Tokyo Area (all day). [97]

[96] GTA Passenger Census, 2010, Page 171

[97] GTA Passenger Census, 2010, Page 38

	Station	Number of Passengers per Day
1	Shinjuku	1,485,666
2	Ikebukuro	1,101,512
3	Shibuya	824,018
4	Tokyo	804,554
5	Yokohama	801,310
6	Shinagawa	659,358
7	Shimbashi	501,364
8	Omiya	480,286
9	Akihabara	468,374
10	Takadanobaba	403,530
11	Kita-Senju	397,248
12	Kawasaki	376,386
13	Ueno	367,222
14	Yurakucho	329,858
15	Tachikawa	314,936
16	Hamamatsucho	306,208
17	Tamachi	291,448
18	Kichijoji	276,966
19	Osaki	276,622
20	Kamata	271,336

Figure 3.11 Major stations in Tokyo. [98]

In Figure 3.9 the massive flow of passengers per day between stations in GTA can be seen. Thereby "万　人/日 "means 10,000 persons per day. Because of this extensive use of the railway system Tokyo established several large-scale stations. According to JR East passenger numbers there are twenty stations, which are being used by more than 25,000 passengers per day and two of them even exceed 1,000,000 in the GTA. The biggest are Shinjuku and Shibuya in the east, Ikebukuro in the north, Tokyo in the west, and Yokohama and Shinagawa in the south. The railway network forms a double circular structure with several main lines connecting both circles and the region with Tokyo.

[98] Annual Report, JR East, 2013, Page 41

4 Redevelopment in Tokyo

In the 1980's the national government presented its policy for urban redevelopment. After government announcement regulations have been continuously eased, culminating in an increased utilization of private resources. However after the burst of the asset bubble in the early 1990's the economy has been struggling ever since. Measure to boost private investment had failed. Finally in 2002 the Act of Special Measures Concerning Urban Renaissance was enacted by the government of Prime Minister Junichiro Koizumi. The law included designated urban redevelopment promotion districts, in which Floor-Area Ratio regulations can be softened. Since its enactment private development saw a revival and an increasing number of high-rise towers along the central loop line have been erected. Due to organizing the Tokyo Olympic Games 2020 this movement is predicted to continue.

4.1 The Bureau of Urban Development

For the metropolitan region of Tokyo the Bureau of Urban Development is in charge of formulating Tokyo's urban development policy. Its tasks include developing roads and railroad, improving built-up areas, providing construction guidance, housing policies, building and managing metropolitan housing. The bureau has seven divisions responsible for the bureau's affairs, projects and formulating policies, and seven offices responsible for supervising projects with a budget of approximately ¥ 488,250 million in 2011[99]. The bureau's housing policy accounted for the largest share of its expenses (¥ 250,052 million[100]), second was Urban Area development (¥ 193,473 million[101]), followed by Infrastructure development (¥ 32,371 million[102]), City Planning and surveys (¥ 5,529 million[103]), and finally Building Administration (¥ 4,825 million[104]).

Table 4.1 Divisions of the Bureau of Urban Development and their tasks[105]

[99] Urban Development in Tokyo, Bureau of Urban Development TMG, 2011, page 2

[100] Urban Development in Tokyo, Bureau of Urban Development TMG, 2011, page 2

[101] Urban Development in Tokyo, Bureau of Urban Development TMG, 2011, page 2

[102] Urban Development in Tokyo, Bureau of Urban Development TMG, 2011, page 2

[103] Urban Development in Tokyo, Bureau of Urban Development TMG, 2011, page 2

[104] Urban Development in Tokyo, Bureau of Urban Development TMG, 2011, page 2

[105] Urban Development in Tokyo, Bureau of Urban Development TMG, 2011, page 28

Name of division	Name of section	Main tasks
General Affairs Division	General Affairs Section/Personnel Section/Planning and Accounting Section/Technical Management Section	Planning and managing implementation of the bureau's affairs and projects: personnel affairs; publicity and listening to citizens' opinions; bureau's budgets; contracts; technical management affairs
Urban Development Policy Division	Regional Coordination Section/Urban Planning Section/ Land Use Planning Section/Development Planning Section/Greenery and Cityscape Section	Planning and coordinating urban development policies, land usage, community development, park greenery; managing the City Planning Council, and creating the cityscape
Housing Policy Promotion Division	Housing Policy Section/Private Housing Section/ Condominium Policy Section/Realty Section	Drafting and planning housing policies; promoting the supply of good quality private housing; supporting the maintenance, management, reconstruction, and seismic retrofitting of condominiums; promoting proper real estate transactions
Urban Infrastructure Division	Coordination Section/Transportation Planning Section/ Road Planning Section	Planning and coordinating the development of urban infrastructure facilities such as roads and railways
Urban Development Projects Division	Management Section/Planning Section/Private Development Section/Disaster Management Section/ Land Readjustment Section/Urban Redevelopment Section/Tama New Town Project Office	Planning, coordination, guidance and subsidies for urban development projects; implementing development projects of the Tokyo Metropolitan Government; promoting disaster-prepared urban development
Urban Building Division	Coordination Section/Building Planning Section/Building Control Section/Construction Industry Section	Building Examination Committee; building safety and earthquake-resistance; confirmation and approval of buildings; licensing of building contractors
Metropolitan Housing Management Division	Management and Planning Section/Guidance and Maintenance Section/Property Utilization Section/Housing Development Section/Facilities Improvement Section	Planning and administering, constructing and maintaining, and tenant management of metropolitan housing projects

The bureau's main task predominantly is the implementation of predicted socioeconomic changes into Tokyo Metropolitan Area's city planning. In order to deal with these changes and to revitalize Tokyo as a leading city of the 21st century the bureau formulated six key policies. [106]

- Revitalize Tokyo as a place in which to live and work
- Develop urban infrastructure that supports the metropolis of Tokyo
- Advance the creation of a comfortable urban environment
- Proceed with urban development to enhance safety and ensure security
- Promotion of housing programs
- Building administration and development control

To meet all six objectives the bureau created a city planning vision for Tokyo in 2001, which was revised in 2009. This vision was established in accordance with the concept of "creating an attractive and prosperous, environmentally leading city" in order to advance urban planning on the perspective of environment, greenery and cityscape. The bureau further promotes Tokyo's development towards a circular megalopolis structure, dividing Tokyo into five zones based on current regional structures.

[106] Urban Development in Tokyo, Bureau of Urban Development TMG, 2011, page 2

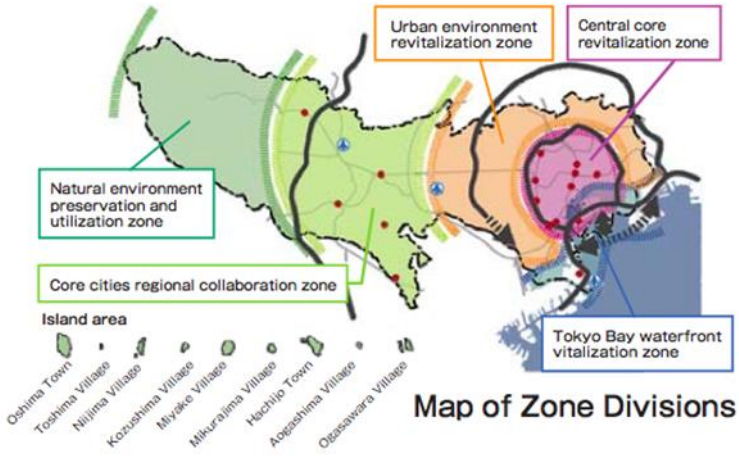


Figure 4.1 Map of Zone Division. [107]

Accordingly the inner city is declared central core revitalization zone in which existing structures should be improved. The still underdeveloped harbor area is classified as Tokyo Bay waterfront vitalization zone. Intensified development should bring Tokyo closer to its waterfront. The residential area belt encircling the inner city is declared urban environment revitalization zone in which particularly environmental measures will be enhanced. The fourth zone is called Core cities regional collaboration zone and includes the outer suburban region in which former independent cities should be steadily merged. Finally the most outer belt is the natural environment preservation and utilization zone and will be used as recreation area, for environmental preservation projects and source for drinking water.

4.2 Tokyo's disaster endangered areas and the idea of Machi-Zukuri

A vast belt of residential areas, largely consisting of close-set wooden residential houses, encircles Tokyo's inner city districts. Due to the specific structure of these areas they are considered a potential fire threat. It is expected that the direct after effect of a major earthquake in Tokyo large fires will break out. In order to reduce potential risks firebreak belts are established to prevent spreading. Also an Urban Hazard Map listing fire threats and established designated development districts was produced.

[107] Urban Development in Tokyo, Bureau of Urban Development TMG, 2011, page 3

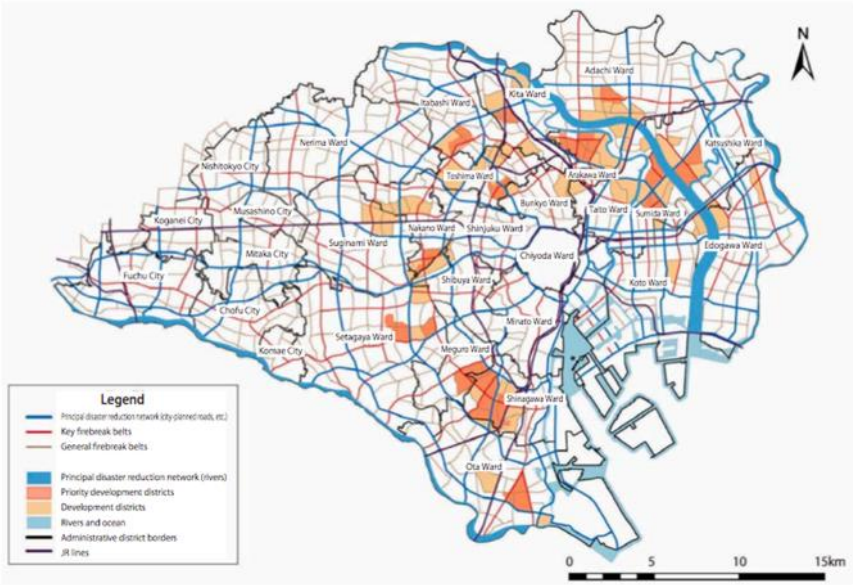


Figure 4.2 Development districts regarding fire threat. [108]

These development districts consist in total of 28 districts covering approximately 7,000 ha[109] and are divided into two categories. Priority development districts include 11 districts covering an area of about 2,400 ha[110]. In these districts various measures are taken to reduce building density. Especially widening of roads and development of fire-resistant roadside is conducted in order to create firebreaks. Also old low-storey wooden structures are demolished and replaced by shared residences in accordance with modern building standards. Additionally parks used as emergency assembly points are designed.

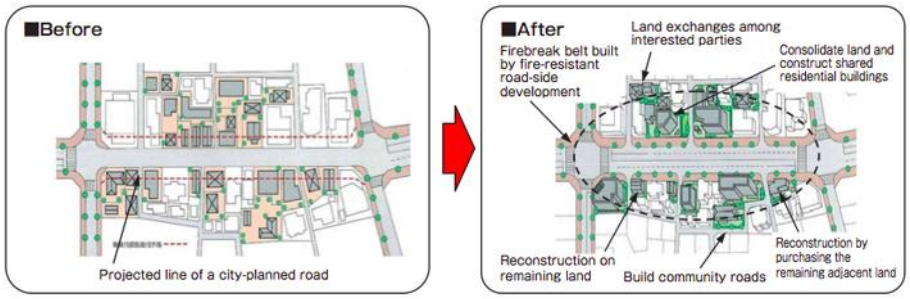


Figure 4.3 Promoted measures for development districts. [111]

[108] Urban Development in Tokyo, Bureau of Urban Development TMG, 2011, page 16

[109] Urban Development in Tokyo, Bureau of Urban Development TMG, 2011, page 16

[110] Urban Development in Tokyo, Bureau of Urban Development TMG, 2011, page 16

[111] Urban Development in Tokyo, Bureau of Urban Development TMG, 2011, page 17

The new layout of residential areas is designed in close collaboration with the local community. Measures are only carried out in agreement with the community. TMG encourages communities to define guidelines for redevelopment in their neighbourhood, allowing planning according to local particularities and enhancing local citizens to identify themselves with the project, increasing acceptance among residents. The Japanese form of community-based redevelopment is called “Machi-zukuri”, which means town-creation.

“Machizukuri” started as a protest movement against centralized city planning in the 1960s, people collectively funded small local development projects. Soon after workshops and initiatives of local residents were organized to improve living quality in high-density build up areas. In the 1980s this movement emphasised improvement of living standard of living including care for the elderly, children day-care, social housing, and disaster mitigation measures on small scale. Local governments acknowledged benefits of this form of community based development and began to promote “Machizukuri”. Nowadays the national government widely includes community-based development in order to establish disaster prevention management and post-disaster reconstruction plans.

4.3 Designated Urban Redevelopment Promotion Districts

In order to boost private urban development Parliament passed the Act on Special Measures Concerning Urban Renaissance (Act No. 22 of 2002) in 2002 including Urban Renaissance Emergency Areas. Within these areas urban development shall be focused and promoted urgently. Therefore Special Urban Renaissance Districts are designated inside the Urban Renaissance Emergency Development Area. These districts allow an application of floor-area ratio regulation, resulting in a more flexible planning procedure. However, in order to prevent uncontrolled growth the districts are selected in accordance with reasonable and healthy intensive land use. Also transfer floor-area ratio rights are allowed within these districts, being beneficial for developers partial development schemes.

①Tokyo Station/Yurakucho district (320ha)
② Loop Road 2 Shimbashi/Akasaka/Ropponngi district (590ha)
③ Akihabara/Kanda district (160ha)
④ Tokyo Waterfront district (1,010ha)
⑤ Shinjuku Station district (220ha)
⑥ Loop Road 4 Shinjuku Tomihisa district (10ha)
⑦ Osaki Station district (60ha)
⑧ Shibuya Station district (139ha)

Figure 4.4 Designated Urban Redevelopment Promotion Districts in the inner city and harbor. [112]

Eight Urban Renaissance Emergency Areas have been selected within the boundaries of Tokyo inner city and within these eight areas 19 Special Urban Renaissance Districts with a total area of 40.7 ha[113] have been designated until 2011.

In order to utilize benefits resulting from Urban Renaissance Law additional measures increasing quality of the area have to be taken. Tokyo Metropolitan Government grants additional Floor-Area if greenery is planted, public squares and boulevards are buillt, and old structures preserved.

4.4 Floor-Area Ratio Bonus System of Tokyo

TMG established several tools to enhance development. The floor-area bonus system is the most powerful instrument. Five different basic types exist to increase floor-area ratio; Specific Block, Intensive Land Use District, Urban Redevelopment Promotion District, Comprehensive Design, and the recently developed scheme to promote greenery.

[112] Urban Development in Tokyo, Presentation by Bureau of Urban Development TMG, 2011, page 3

[113] Urban Development in Tokyo, Presentation obyBureau of Urban Development TMG, 2011, page 4

4.4.1 Specific Block

The specific block is applicable to large-scale projects, which intend to upgrade urban functions and preserve urban space. Due to provision of open space exceptions of applying general building regulations such as floor area ratio, building coverage ratio and height limitation can be made.

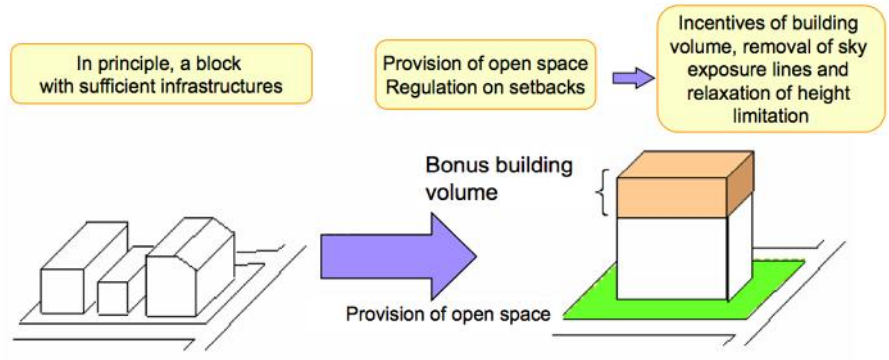


Figure 4.5 Specific Block. [114]

4.4.2 Intensive Land Use District

Intensive Land Use Districts promote integrated segmented land tracts in high-density urbanized areas. Thereby small land tracts are combined and developed. The newly developed area provides setbacks, reduction of building coverage and provision of housing in exchange for floor-area incentives.

[114] Urban Development in Tokyo, Presentation by Bureau of Urban Development TMG, 2011, page 8

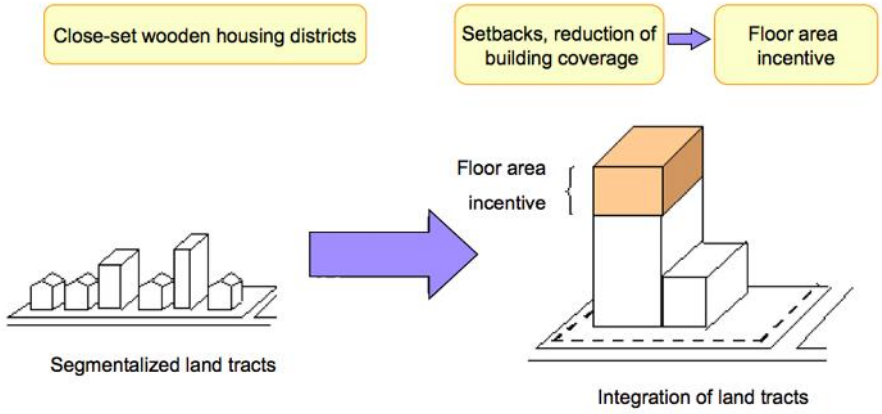


Figure 4.6 Intensive Land Use District. [115]

4.4.3 Urban Redevelopment Promotion District

Urban Redevelopment Promotion Districts promote land use transition of unused or under-used large-scale tracts, especially former factory sites, rail yards or port facilities. Exceptions of applying general building regulations such as floor area ratio, building coverage ratio and height limitation are made in order to effectively use land, promote area revitalization and urban functions, and provide houses and offices in such areas.

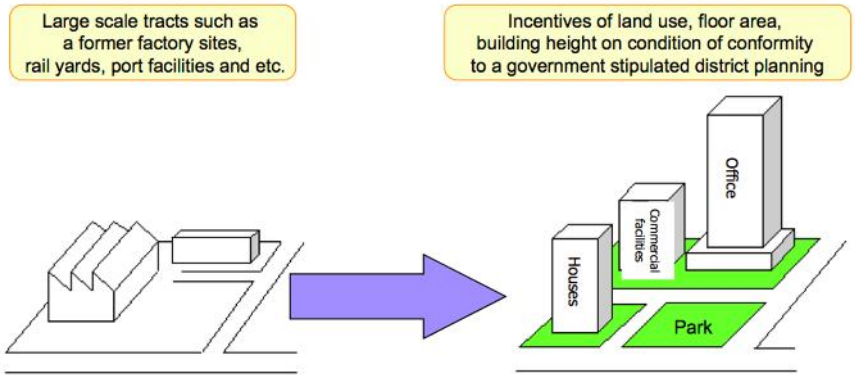


Figure 4.7 Urban Redevelopment Promotion Districts. [116]

[115] Urban Development in Tokyo, Presentation by Bureau of Urban Development TMG, 2011, page 9

[116] Urban Development in Tokyo, Presentation by Bureau of Urban Development TMG, 2011, page 10

4.4.4 Comprehensive Design

Building regulations on building volume, building envelopes, building height for large-scale projects are relaxed in order to promote an effective and rational design. This should guarantee structures to integrate harmoniously into surrounding area.

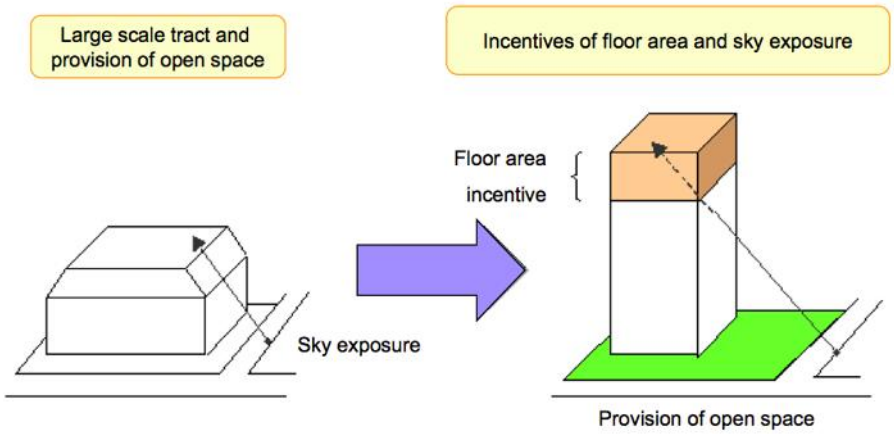


Figure 4.8 Mapping of accumulated data. [117]

4.4.5 Schemes promoting greenery

In 1981 Tokyo Metropolitan Government implemented an Environmental Impact Assessment system, estimating and minimizing possible impacts on the environment arising from future projects. Prior to development of a project such an Environmental Impact Assessment must be conducted. Results of the assessment must be open to the public. The system was revised in 2002. Since revision large-scale projects must follow the environmental impact assessment procedures in the planning phase. In total the system distinguishes 26 categories of projects, for each category requirements by TMG are defined. The system differentiates two types of procedure, for TMG projects and for private sector projects.

[117] Urban Development in Tokyo, Presentation by Bureau of Urban Development TMG, 2011, page 11

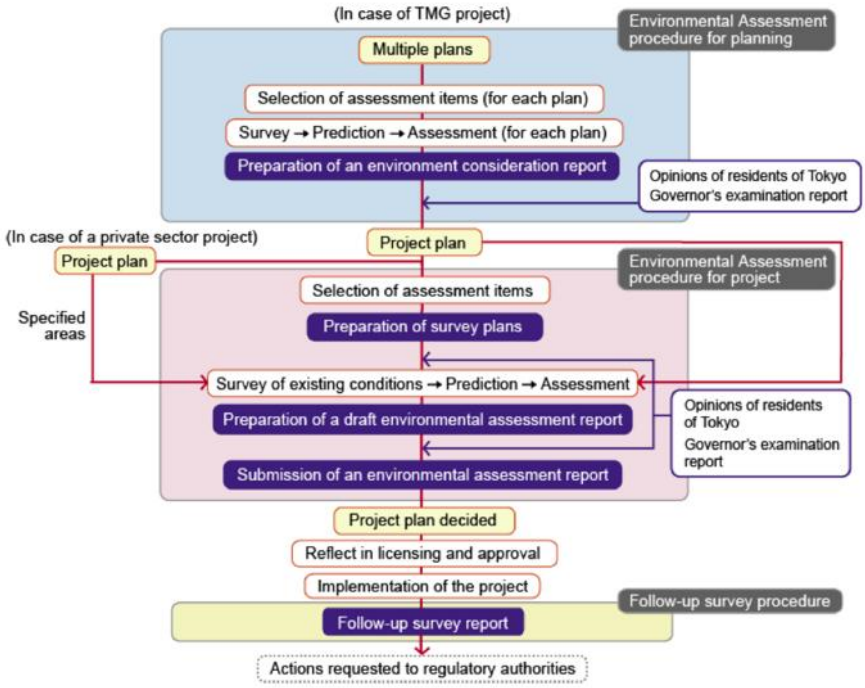


Figure 4.9 Basic Environmental Impact Assessment System used by TMG. [118]

Basically there are three different stages including ten major steps. The first stage is made up by four steps. Step 1 is preparation of an Environment Consideration Report by the project company, which will be available to the public for 30 days. Step 2: the project company has to hold explanatory meetings regarding the report during public inspection period of 30 days. Step 3: residents are allowed to submit opinions. Step 4: a town hall hearing is being held, in which residents present their opinions. This stage is usually processed within 180 days. The second stage is the detailed planning stage and includes five steps. Step 5 is submission of a survey plan describing methods for surveying. The survey plan is open to the public for ten days from its announcement. Step 6: a draft environmental assessment report is executed by the Project Company and open to the public for 30 days. After inspection, public opinion and suggestions are published, in step 7 a business opinion report is handed in. This business opinion report expresses the company's point of view referring public opinion and is open to the public for 20 days. Step 8: the environmental assessment report is submitted and available for public inspection for 15 days. After inspection the governor grants approval of the project or requests necessary measures. This stage is usually processed within 185 to 200 days. The final stage is

[118] Environmental Impact Assessment System of the TMG, TMG, 2014, Page 6

called procedure for follow-up survey in which the company is to submit a plan for conducting a follow-up survey after completion of the project.

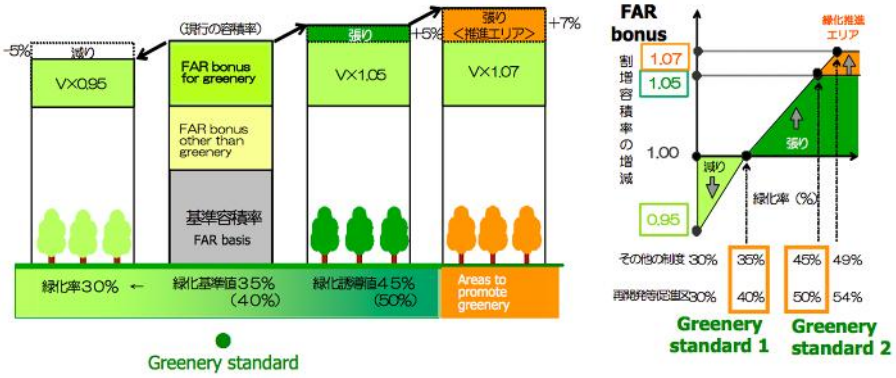


Figure 4.10 New Scheme to Promote Greenery. [119]

As a recent development Tokyo Metropolitan Government wants to increase greenery in urban space. To promote this movement projects with a greenery ratio of 35 to 45 % are rewarded with bonus of floor-area ratio of 40 to 50 % and projects with greenery ratio below 35 % (in case of promotion area 40 %) are punished by a decrease of floor-area ratio.

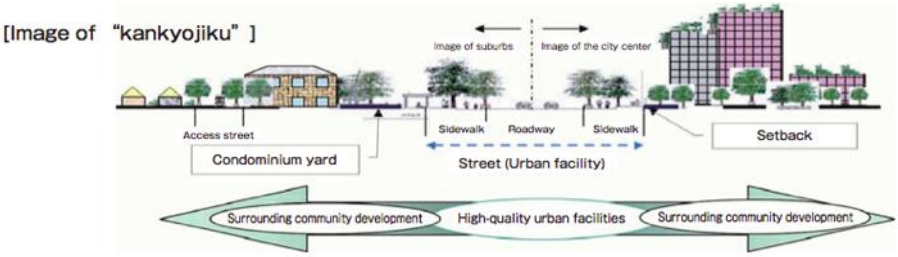


Figure 4.11 Image of "kankyojiku". [120]

Not only should greenery be planted in private development but also in government-community projects. TMG formulated the idea of "kankyojiku", which are networks of urban spaces with greenery, planted alongside boulevards, rivers and parks. In a "kankyojiku" greenery will be planted alongside publicly owned urban facilities such as roads and rivers and private land owners will be enhanced to establish community based greenery development. In 2008 a "kankyojiku" promotion plan was formulated and several study zones have been conducted.

[119] Urban Development in Tokyo, Presentation by Bureau of Urban Development TMG, 2011, page 16

[120] Urban Development in Tokyo, Bureau of Urban Development TMG, 2011, page 19

4.4.6 Land Use districts and Floor-Area Ratio Zones in Tokyo

Japanese government established its first Land Use Zoning System in 1919, only differentiating three different types, residential, commercial and industrial districts. Since its enactment it was revised three times, last 1992. Today twelve different types of zones exist, mixed used zones. Included floor-area ratio and building coverage ratio are defined for each zone.

Table 4.2 Land Use Zone Categories with FAR and building coverage ratio[121]

Category of Land Use Zone	Maximum floor-area ratios (%)	Maximum building coverage ratios (%)
Category I exclusively low-rise residential zone	50 60 80 100 150 200	30 40 50 60
Category II exclusively low-rise residential zone	50 60 80 100 150 200	30 40 50 60
Category I mid/high-rise oriented residential zone	100 150 200 300 400 500	30 40 50 60
Category II mid/high-rise oriented residential zone	100 150 200 300 400 500	30 40 50 60
Category I residential zone	100 150 200 300 400 500	50 60 80
Category II residential zone	100 150 200 300 400 500	50 60 80
Quasi-residential zone	100 150 200 300 400 500	50 60 80
Neighborhood commercial zone	100 150 200 300 400 500	60 80
Commercial zone	200 300 400 500 600 700 800 900 1000 1100 1200 1300	80
Quasi-industrial zone	100 150 200 300 400 500	50 60 80
Industrial zone	100 150 200 300 400	50 60
Exclusively industrial zone	100 150 200 300 400	30 40 50 60

Regarding the twelve different types eleven different floor-area ratio zones can be distinguished for the 23 wards of Tokyo. The highest floor-area ratio is found in central business districts along the Yamanote loop line.

[121] Urban Land Use Planning System in Japan, MLIT, 2014, Page 5

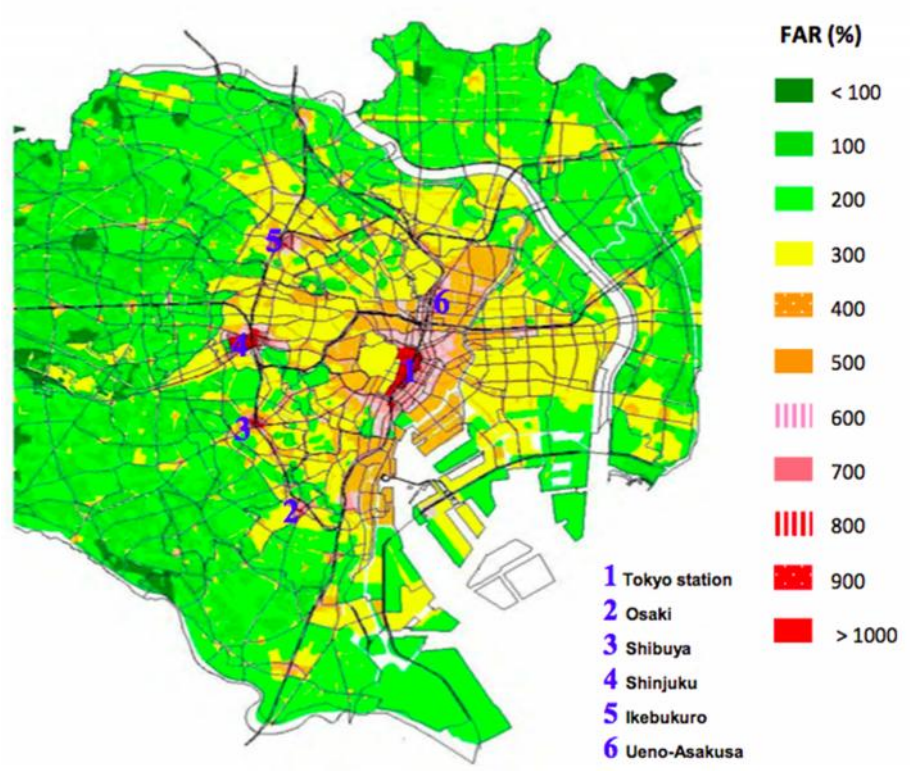


Figure 4.12 Floor Area Ratio within the 23 wards of Tokyo.

4.4.7 Tokyo's Strategic Plan for Land Use

Utilizing these instruments effectively Tokyo authorities designed a general urban development strategy including four different types of zones, city center hubs, mixed used urban zones, zones of housing-office adjacency and other hubs. This strategy focuses on the central 23 wards and several sub-centers in the Greater Tokyo Area. Each of the four types is promoting different forms of projects in accordance to local particularities and TMG vision. Especially the city center hubs located along the central loop line, the port, special development areas in suburban areas and high-density office districts with high-rise towers are promoted.

Figure 4.13 Designated promotion areas. [122]

Depending on zone type Tokyo Metropolitan Government grants a specified floor-area bonus in exchange of measures mentioned earlier. The bonus varies from 175 % up to 300 %.

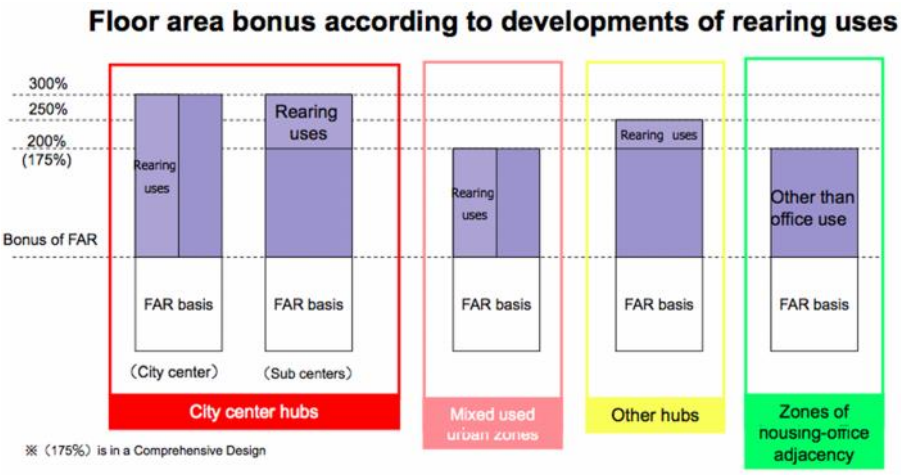


Figure 4.14 Floor area ratio bonus according land use. [123]

[122] Urban Development in Tokyo, Presentation by Bureau of Urban Development TMG, 2011, page 12

[123] Urban Development in Tokyo, Presentation by Bureau of Urban Development TMG, 2011, page 13

4.5 Negative impacts and issues of Tokyo's urban policy

4.5.1 Urban Sprawl

Due to uncontrolled rapid growth of urban space within Greater Tokyo Area the city is facing severe problems by urban sprawl. Preventing it is can be considered a major trigger to establish modern urban planning systems in Tokyo, resulting in division of urban areas in Tokyo into three categories:

- Urbanization Promotion Area (UPA)
- Urbanization Control Area (UCA)
- Undivided Urban Area (UUA)

However, due to certain regulations building permissions referring to urban sprawl was continuing. In UPA single lot development is permitted if the lot is attached to a street with minimum 4 m width, which resulted in massive urban sprawl due to accumulation of small-scale and plot-by-plot development. In UCA housing for local farmers and their as families well as retail and public facilities are permitted causing urbanization in underdeveloped areas. Generally liberal building permissions and regulations accumulated various kinds of development within UUA. To avoid this Development City Planning Law was amended and building permission regulations were tightened. Nevertheless these new regulations were enacted too late and the readjustment progress is obstructed by increasing urban sprawl. [124]

4.5.2 Intense use of Transit-Oriented Development

Tokyo's naturally grown structure culminating in the establishment of transit-oriented development, caused high density and pedestrian-oriented centers around railway stations, resulting in narrow streets with sharp bends and inadequate sidewalks. Several negative side effects for accessibility can be observed in such areas. Baby strollers, wheelchair users and vehicle users often find it difficult to move along in such areas. It also does not allow the metropolitan government to establish a general

[124] Tokyo's Urban Growth, Urban Form and Sustainability, Okata and Murayama, 2011, Page 22 f.

bicycle concept. In recent years TMG increased its efforts to create barrier free environment. [125]

4.5.3 Maximization of Urban Centers

Recent trends of promoting large-scale inner city redevelopment projects and FAR bonus system led to increased density of high-rise towers in existing environments surrounding Tokyo's major stations, creating numerous urban centers. This led to increase of jobs and retail businesses, attracting visitors and shoppers during daytime. According to the 2010 census three central wards, Chiyoda, Chuo and Minato have a daytime population of 616.3 % in comparison night-time thus resulting in large imbalance and public transport congestion rates of more than 200 %.[126]

4.5.4 Redevelopment of industrial zones

Tokyo's industrial areas, with specially high concentration in Tokyo Bay waterfront area, contributing to Japan's economic growth during the 20th century, are undergoing major changes. Heavy industry has been relocated to less populated areas or outsourced to foreign countries. Former industrial sites often covering a large area now allow to realize less complex utilization concepts and thus are more attractive for private development. TMG enhances redevelopment for such areas and projects are often promptly permitted to be realized. However, due to heavy soil contamination and inadequate infrastructure of surrounding area most sites are not appropriate for commercial and residential use. In order to boost redevelopment for vacant industrial areas on the waterfront TMG started infrastructure improvement and focused development strategy for Tokyo Olympic games 2020 along the waterfront. [127]

4.5.5 Non-perception of historic areas

The Law for the Protection of Cultural Properties provides municipalities with instruments to protect historic building complexes. Municipalities can declare building complexes as preservation districts, providing financial and technical support. Plans for improvement and maintenance are usually based on national government policy and supervised by local councils. However, approval of these plans is subject to the national

[125] Tokyo's Urban Growth, Urban Form and Sustainability, Okata and Murayama, 2011, Page 23 f.

[126] Tokyo's Urban Growth, Urban Form and Sustainability, Okata and Murayama, 2011, Page 24 ff.

[127] Tokyo's Urban Growth, Urban Form and Sustainability, Okata and Murayama, 2011, Page 27 ff.

government which results in longer processing time due to extended hierarchy. Another problem is that TMG still is unaware of the importance of its heritage. Within Tokyo only 71 structures and 29 areas are categorized as “Historical Buildings and Sites of Scenic Importance” and only two areas in Greater Tokyo Region are classified as preservation districts Kawagoe in Saitama Prefecture (7.8 ha) and Sawara in Chiba Prefecture (7.1ha), resulting in destruction of several historic areas and demolition of notable buildings. [128]

4.5.6 Improvement of residential settlements

Due to a potential threat of fires, redevelopment in endangered areas is carried out. Continuously complexity of structure in certain districts make redevelopment costly and difficult, resulting in delaying urgent measures. Nevertheless several areas have been modified resulting in higher living standard, making redeveloped districts attractive to private developers, aiming at higher income citizens, and perhaps causing exchange of residents. [129]

4.5.7 Promotion of Suburban region

During the rapid economic growth period in the 1960s and 1970s numerous suburban housing development projects were carried out, this movement specially peaked during bubble economy periods in the late 1980s. After the burst of the asset bubble many of these housing estates remained vacant. A period of stagnation and low-growth rates followed, resulting in a depopulation of these suburban areas further increased by an aging society. Due to the decline of residents many public facilities as well as retail business moved to more urbanized areas causing an acceleration of this effect thus making maintenance a difficult task. Regardless of including suburban areas into TMG’s vision of a sustainable metropolis, TMG is still unable to establish an appropriate solution. In order to encounter issues caused by depopulation of suburban districts TMG is trying to promote the establishment of a diverse population and multi-family housing. [130]

[128] Tokyo’s Urban Growth, Urban Form and Sustainability, Okata and Murayama, 2011, Page 30

[129] Tokyo’s Urban Growth, Urban Form and Sustainability, Okata and Murayama, 2011, Page 30

[130] Tokyo’s Urban Growth, Urban Form and Sustainability, Okata and Murayama, 2011, Page 30 f.

5 Redevelopment Projects including Preservation and or Restoration

In recent years preservation became more and more important. Private developers realized the enormous potential of historic landmark buildings. This movement was accelerated by public support and government promotion programs mentioned above. Especially after 2000 efforts have been increased to preserve and utilize Japan's architectural heritage. Some of the most famous project are listed and described below.

- Mitsubishi Ichigokan Museum
- Kabuki-Za
- Japan Central Post Office

All these projects were realized by private developers. Each design was either combined modern elements or merged with modern day structures. The Ichigokan Museum is part of Mitsubishi Headquarters in Marunouchi, Kabuki-za is a Kabuki Theater connected with a modern skyscraper and the Japan Post Tower in Marunouchi was hollowed out and merged with a modern glass high rise tower.

5.1 Mitsubishi Ichigokan Museum

The 1894 built Mitsubishi Ichigokan was initially designed as Mitsubishi's headquarter and the first office building constructed in Marunouchi area. The English architect Josiah Conder planned the building in a Queen Anne style red brick design, similar to later built Tokyo station. The red brick design was typical for Japan's Meiji era structures. Mitsubishi expanded rapidly and soon moved out. The building was rented out but the aging structure was torn down in 1968. Due to the upcoming movement of preservation in Japan and a more delicate approach towards its past the company decided to restore the structure in its original form. This contribution to raise historical awareness should also promote Mitsubishi as a company with historical background. To restore the building a research team recreated the plans based on blueprints and survey maps from the building's demolition as well as photographs. Eventually some remaining interior components could be used, such as handrails for staircases. Construction started in February 2007 and ended in April 2009.

Figure 5.1 Restored Mitsubishi Ichigokan. [131]

The newly restored Ichigokan has three floors above and one floor under ground. Building height is approximately 15 m and total floor space about 6,000 m²[132]. The restored structure is divided into two sections by a seismic isolation layer between underground and above ground section, ensuring safety even in a high intensity earthquake event. The new Ichigokan is used as a museum and hosts Mitsubishi's art collection.

[131] http://mimt.jp/english/about/, on July 2nd, 2014

[132] Marunouchi Park Building, Mitsubishi Estate, Page 2

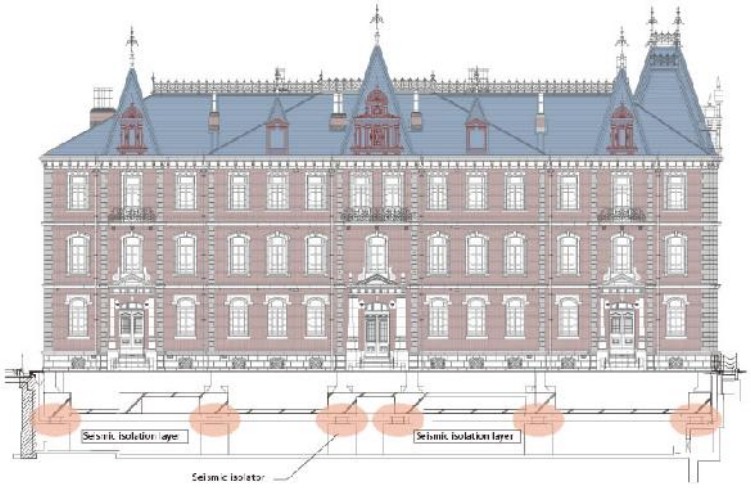


Figure 5.2 North View of the Ichigokan with plan of aseismic retrofitting. [133]

The restored structure is part of Park Building Complex and is therefore connected with 157 m high rise Park Building. The Park Building has 34 floors above and four floors underground and a total floor area of approximately 196,000 m² [134]. To realize a high-rise tower Mitsubishi utilized several instruments to increase FAR. The Marunouchi district was declared Priority Urban Regeneration Zone and FAR of 1,300 % [135] was announced for the entire area. Additionally TMG proclaimed Tokyo station and adjacent lots an Exceptional Floor Area Ratio district and made it possible to transfer unused FAR between lots, making it possible for Mitsubishi to buy FAR rights from JR East. Furthermore restoration of Ichigokan and planning an up to date high rise office tower applied to the requirements of strengthening global competitiveness by improving urban infrastructure and creating attractive urban space, which resulted in TMG's decision to approve the project as a Private Sector Urban Renewal Project in November 2006. Additionally the project was proclaimed Pilot Project for Cool City Central Zone aiming to reduce city heat island effects with construction of a low-carbon building. The measures taken led to an additional FAR bonus of 230 % [136], which was further increased by 130 % [137] by buying unused FAR from JR East, resulting in a total FAR of 1,660 % [138]. (see Figure 5.3)

[133] http://mimt.jp/english/about/, on July 2nd, 2014

[134] http://office.mec.co.jp/lineup/bldg_detail?bd=952&l=E, on July 2nd, 2014

[135] Marunouchi Park Building, Mitsubishi Estate, Page 3

[136] Marunouchi Park Building, Mitsubishi Estate, Page 3

[137] Marunouchi Park Building, Mitsubishi Estate, Page 3

[138] Marunouchi Park Building, Mitsubishi Estate, Page 3

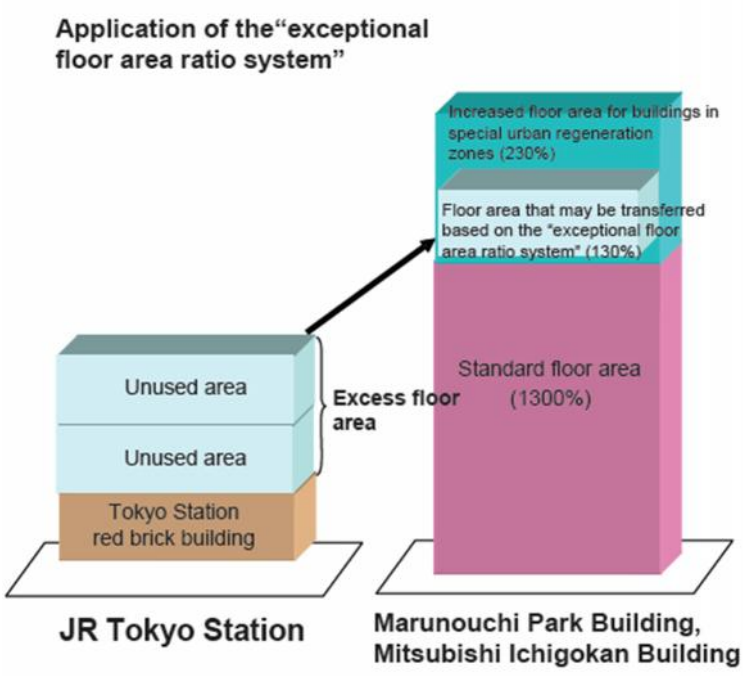


Figure 5.3 FAR bonus of Marunouchi Park Building. [139]

5.2 Kabuki-za

The Kabuki-za is Tokyo's major theater for Kabuki, the Japanese traditional dance-drama play, and located in Ginza, known as Tokyo's most expensive area. Originally built in 1889 the wooden structure burned down due to fire caused by short circuit. A second structure was designed in a Western-Japanese style using Western building materials. However, during construction the building burned down in the Great Kanto Earthquake in 1923. A third structure was designed in a baroque Japanese style derived from Japanese castle architecture. During WW II it burned down once again and finally was reconstructed in its present form. Public initiatives repeatedly tried to ask for governmental support to save and restore the aging structure. These efforts found fruitful ground and finally Shochiku Corp. owner and operator of Kabuki-Za announced its redevelopment. In 2010 construction work started. Main reasons for the redevelopment were the aging structure did not apply to modern building and safety standards and the company also wanted to utilize an underdeveloped lot located in the heart of the most expensive district of Tokyo. [140]

[139] Marunouchi Park Building, Mitsubishi Estate, Page 3

[140] http://www.nippon.com/en/views/b03002/, on 4th July 2014

Figure 5.4 Kabuki-za before redevelopment. [141]

The new theater was designed by Kengo Kuma and is connected to a 143 m high rise tower. The structure has 29 floors above and four below ground and a total floor space of approximately 93,500 m² [142], total site area is approximately 5,905 m² [143]. Modernizing the aging structure, environmental friendly design and creating a public boulevard allowed to increase FAR to 1,580 %. The new design includes exterior features of the fourth design and interior features of the third. The prominent karahafu roof above the central entrance and the large hafu roofs on both sides resemble previous appearance of the façades.

[141] http://www.japantimes.co.jp/news/2013/03/19/reference/ginza-stage-set-for-kabuki-zas-fifth-coming/#.VDPZwOpxl7R, on July, 4th 2014

[142] Shimizu Annual Report 2013, Shimizu, 2013, Page 18

[143] Shimizu Annual Report 2013, Shimizu, 2013, Page 18

Figure 5.5 Kabuki-za after redevelopment. [144]

5.3 Japan Central Post Office

The Tokyo Central Post office was designed by Japanese architect Tetsuro Yoshida. The building was constructed in 1931 and is regarded an outstanding example of early Japanese modern architecture. Originally developed as headquarter for Japan Post, soon the structure proved to be too small. Japan Post moved its organizational structure out and used the building as a major post office. The building was badly maintained and consequently dilapidated. After privatization of Japan Post the newly established company announced redevelopment of its property. The initial design included demolition of the old structure. Public initiatives and governmental intervention successfully convinced

[144] http://kkaa.co.jp/news/ginza-kabukiza/, on July, 4th 2014

Japan Post to preserve the old structure. The new design envisioned to merge the old building with a modern glass sky scraper. Therefore the original building was to be hollowed out and the remaining exterior walls functioned as façade of the lower section of the new tower. Construction started in November 2009 and was finished in May 2012. [145]

Figure 5.6 Modernized Japan Post Tower.

The new JP Tower is a 200 m tall high-rise tower with 38 stories above ground and four underground and a total floor space of approximately 212,000 m^2 [146]. The lower section is used as an atrium hall with a shopping area, the tower contains a museum, a conference center and offices.

[145] http://archinect.com/blog/article/21453422/central-post-offices-in-japan/, on July, 10th 2014

[146] http://www.eonet.ne.jp/~building-pc/tokyo-kensetu/tokyo-200jp-tower.htm, on July, 10th 2014

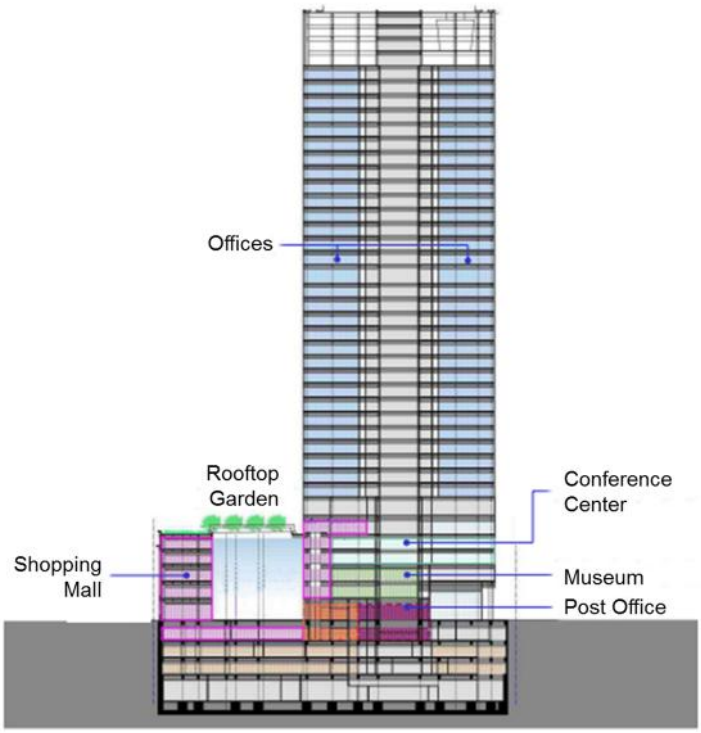


Figure 5.7 Cross-section of JP Tower. [147]

The JP Tower has FAR of 1,820 %, oe among the highest in Japan. In order to achieve such a high FAR several FAR bonus instruments were utilized, it is designed as a low carbon emission structure. Due to the installation of airflow-windows, a special shading system and an ingenious system of air shafts and heat exchangers the façade functions as a natural cooling system. Furthermore the building contains a geothermal powered underfloor heating and cooling system. Additional roof greening, a generous public space and the preservation of the old structure increased FAR bonus.

[147] Source: JP Tower, Presentation by JP Post, Page 4

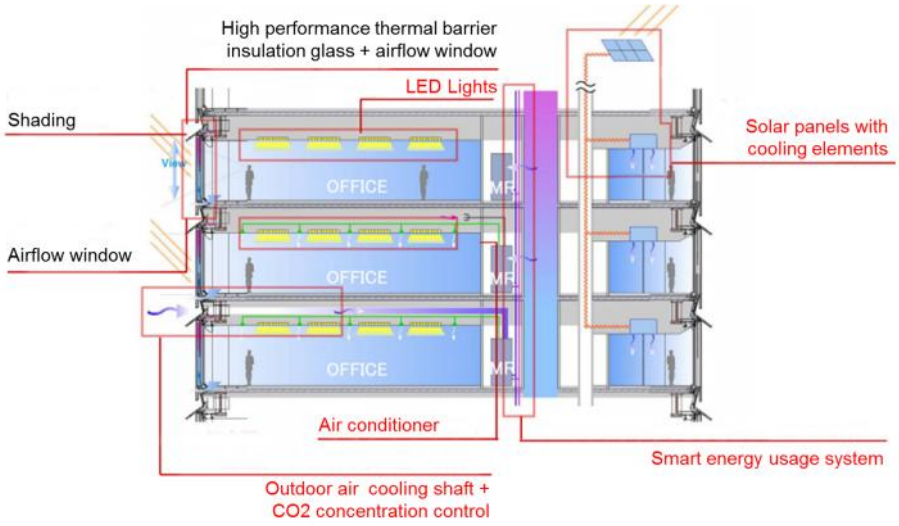


Figure 5.8 Floor cooling system in JP Tower. [148]

[148] Source: JP Tower, Presentation by JP Post, Page 9

6 Tokyo Station City Project

Tokyo station being the major hub of the city's central business district and facing the emperor's palace can be considered as Japan's most prestigious railway station. During the period of rapid economic growth in the 1960's and 1970's the surrounding area of changed to a modern business district, leaving Tokyo station the only surviving redbrick structure in the area. Unable to face modern needs and badly maintained structure made it necessary to conduct major repair work on facilities. In 1914 the original station had been designed for approximately 12,000[149] passengers per day, according to JR East it was frequented by approximately 804,000 [150] passengers per day in 2013. Voices to demolish the structure and replace it with an efficient high-rise tower became louder. To provide optimal utilization its owner JR East decided to redevelop the station and its surroundings. With Japan's rise to economic power awareness for its historical structures increased. In the late 1980's the movement for preservation became stronger and so the architecturally distinguished redbrick structure of Tokyo station reflecting urban planning and architectural style of the Meiji era became a major object for this movement. Convinced of its cultural value JR East announced the restoration of the building and planned to upgrade the aging facility, contributing to the area's change towards a prosperous, modern, and sustainable business district. Therefore four major issues, which had to be met by station redevelopment, were defined.

- Temporary restoration of Marunouchi building after WW II[151]
- The station plaza being unable to face modern traffic needs[152]
- Demand for a central landmark structure in the Otemachi-Marunouchi-Yurakucho development[153]
- Underdevelopment of the Yaesu side[154]

With modernization of the station JR East wanted to create a new type of station, which no longer just provided travelers with specific services. Knowing the station's enormous potential JR East saw a possibility to extend its services, allowing to make use of a high frequency of travelers and pedestrians. Therefore a complex of modern high-rise towers, luxury shopping malls, hotels and restaurants was planned to become a space

[149] Geographic Study of Historic Preservation: Evolving Cultural Landscape and Development of Modern Japan, Walcott, 2013, Page 97

[150] Annual Report, JR East, 2013, Page 41

[151] Aiming for the Creation of new space – Development of Tokyo Station City, Atsuo Maeda, Page 5

[152] Aiming for the Creation of new space – Development of Tokyo Station City, Atsuo Maeda, Page 5

[153] Aiming for the Creation of new space – Development of Tokyo Station City, Atsuo Maeda, Page 5

[154] Aiming for the Creation of new space – Development of Tokyo Station City, Atsuo Maeda, Page 5

of living, travel, work and leisure. This new type of station, designed to be a city within the city, should represent JR East's strategy of becoming a sustainable 21st century company focusing on high value assets.

6.1 JR East

In 1987 the government-owned Japan National Railways was privatized and split into seven regional operators, including East Japan Railway Company (JR East), which was awarded to operate and facilitate the largest region, GTA and Tohoku region. Because of its size and importance a share was held by the national government, which was sold in 2002, allowing full privatization.

6.1.1 Corporate Data

Today JR East is the largest passenger railway company in Japan and owns a network of more than 7,500 km[155] (1,417 km of High-speed railway, 2,550 km as Tokyo urban network and 3,586 km as Local network) covering the entire eastern half of Honshu. JR East employed 73,017[156] persons and generated an operating revenue of ¥ 2.67 trillion[157] and an operating income of ¥ 397.6 billion[158] in 2013. Its headquarters is located in Tokyo and it is listed in the Nikkei 225 at the Tokyo Stock Exchange.

[155] Annual Report, JR East, 2013, Page 62

[156] Annual Report, JR East, 2013, Page 62

[157] Annual Report, JR East, 2013, Page 5

[158] Annual Report, JR East, 2013, Page 5

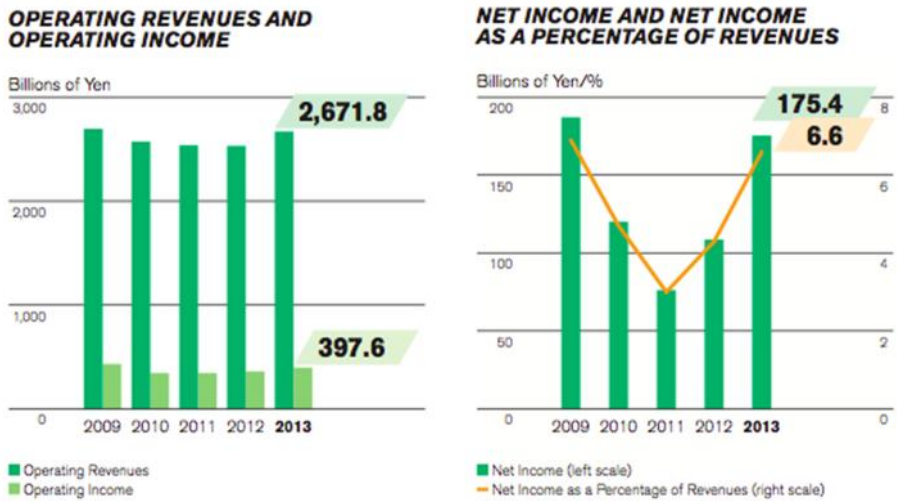


Figure 6.1 Operating Revenue & Income and Net Income by JR East in 2013. [159]

After privatization of JR East, the new entity was restricted to develop company owned land in order to sell property and pay back depts. The spun off railway companies were also committed to operate a profitable railway network. After 2002 JR East was free to develop its land, nevertheless additional assets such as shopping centers, are still a minor business field of JR East. This explains why the company mainly generates its revenue from the transportation segment (67.2 % in 2013) [160]. ¥ 849.9 billion[161] of the transportation segment are generated by passenger ticket revenue within GTA, representing a market share of approximately 43.2 %[162].

[159] Annual Report, JR East, 2013, Page 7

[160] Annual Report, JR East, 2013, Page 6

[161] Annual Report, JR East, 2013, Page 66

[162] Annual Report, JR East, 2013, Page 66

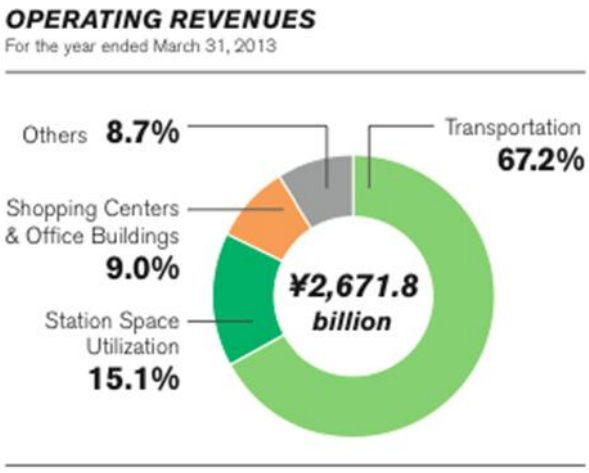


Figure 6.2 Composition of Operating Revenue by JR East. [163]

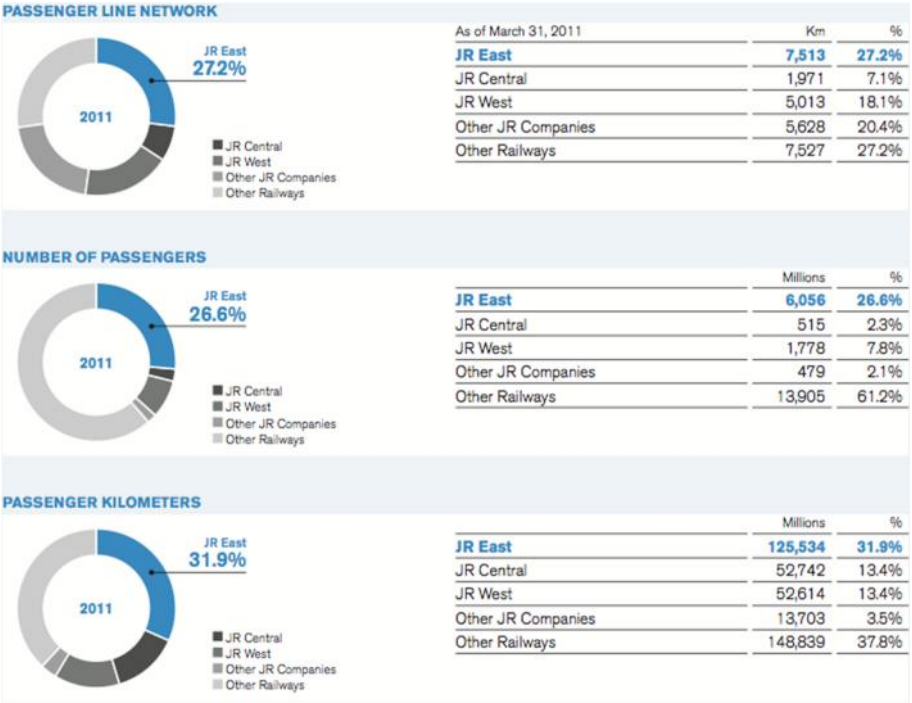
In comparison with other domestic railway companies JR East is by far the largest operator in terms of length of network (7,527 km[164]), number of passengers (6,056 million[165]) and passenger kilometres (125,534 million[166]).

[163] Annual Report, JR East, 2013, Page 6

[164] Annual Report, JR East, 2013, Page 62

[165] Annual Report, JR East, 2013, Page 62

[166] Annual Report, JR East, 2013, Page 62



As of March 31, 2011	Km	%
JR East	**7,513**	**27.2%**
JR Central	1,971	7.1%
JR West	5,013	18.1%
Other JR Companies	5,628	20.4%
Other Railways	7,527	27.2%

	Millions	%
JR East	**6,056**	**26.6%**
JR Central	515	2.3%
JR West	1,778	7.8%
Other JR Companies	479	2.1%
Other Railways	13,905	61.2%

	Millions	%
JR East	**125,534**	**31.9%**
JR Central	52,742	13.4%
JR West	52,614	13.4%
Other JR Companies	13,703	3.5%
Other Railways	148,839	37.8%

Figure 6.3 Passenger related numbers by JR East in 2013. [167]

6.1.2 Shinkansen network

Japan's high-speed railway network consists of about 2,620 km, JR East operates five main lines, the Akita, the Nagano (117 km), the Jōetsu (270 km), the Tohoku (593 km) and the Yamagata Shinkansen line. The JR East's Shinkansen system by is undergoing several changes at the moment. The network will be extended by Hokuriku Shinkansen and Hokkaido Shinkansen lines by the end of FY 2015 with the new high-speed train series E6 operating which will run at a speed of 320 km/h.

[167] Annual Report, JR East, 2013, Page 63

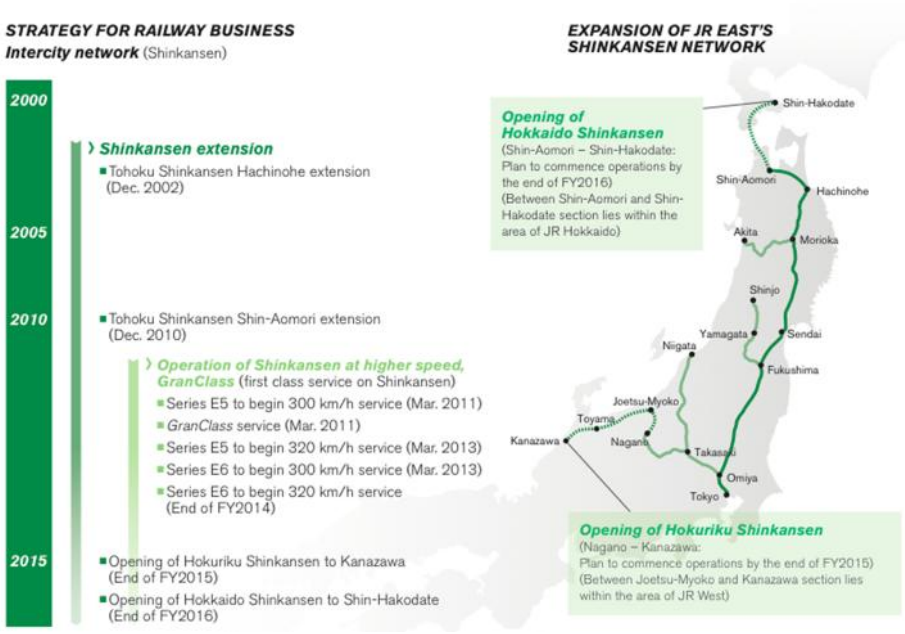


Figure 6.4 Shinkansen Network & future development by JR East in 2013. [168]

6.1.3 Organization

In order to obtain a high degree of flexibility the organization of JR East is based on a flat hierarchical system, providing hierarchically higher entities with a greater variety of tasks. JR East is a listed stock corporation under Japanese law and maintains all required bodies. On top of JR East are the Shareholders with the Board of Directors, led by a Chairman. The President, supervised by the Board, is responsible for the company divisions. Basically four different branches exist, planning division, local office branches, administrative departments, and R&D division.

[168] Annual Report, JR East, 2013, Page 39

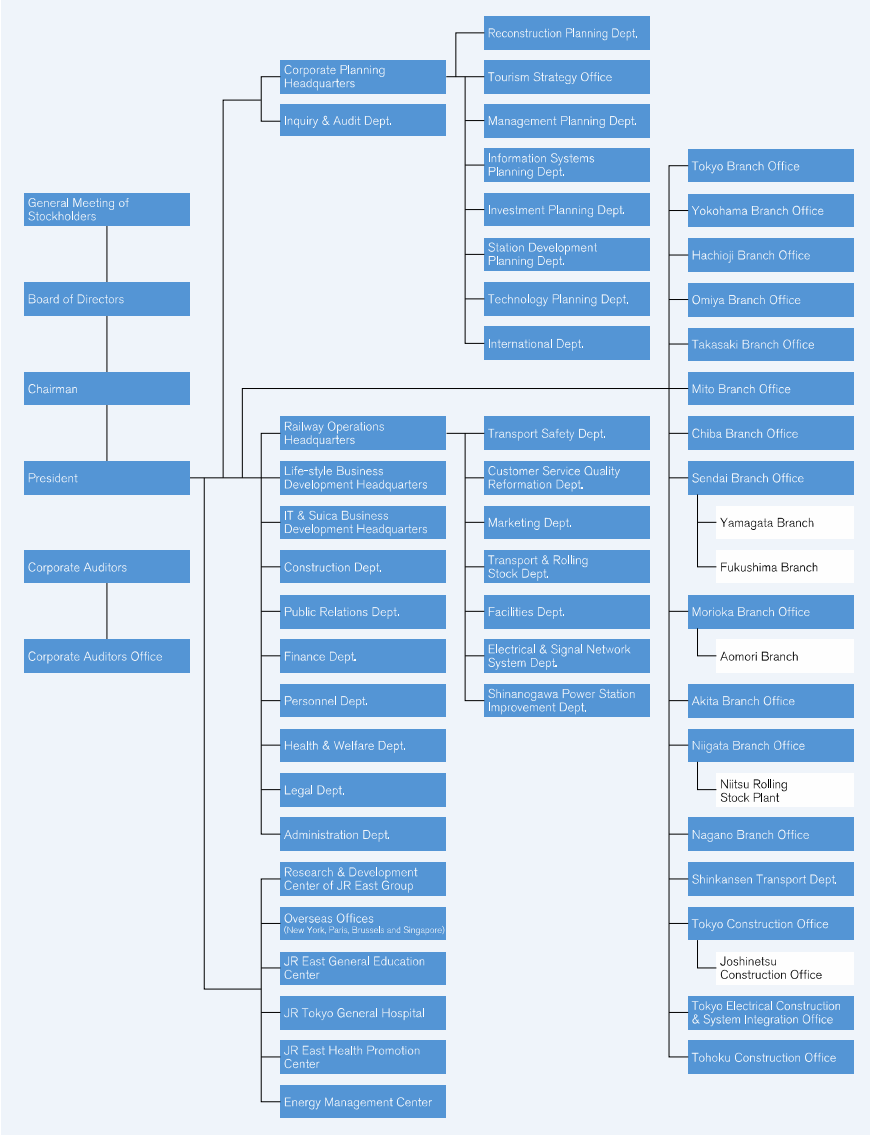


Figure 6.5 JR East Organization. [169]

6.2 History of Tokyo Station

In 1872 Japan opened its first railway line, connecting Shimbashi and Yokohama. Soon after the railway system was rapidly expanded and a line starting from Ueno reaching the North was opened, leaving the center of Tokyo undeveloped. Tokyo's position in the very heart of Japan and its evolvement to a modern capital was essential for becoming an

[169] Annual Report, JR East, 2013, Page 111

industrialized nation. The prefectural government recognized the need for a railway linking North and South. In 1888 planning of a central station was started. A suitable location was selected and in 1903 a first design by German railway engineer Franz Balzer, who was technical advisor to the Railway Bureau of the Ministry of Communications, was submitted. This design was a mixture of Western and Asian styles but was rejected due to objections by Emperor Meiji. After rejection of the first plan Kingo Tatsuno was commissioned with design. Kingo Tatsuno had earned great reputation for his design of the Bank of Japan building and proved himself as one of the best contemporary architects of Japan. With a budget of only ¥ 420,000[170] (amount in 1904) only a moderate structure should have been erected but after victory in the Russo-Japanese War in 1905 the government requested a "station that would amaze the world". The now increased budget of ¥ 2.8 million[171] allowed Tatsuno to design a large three-storey station building.

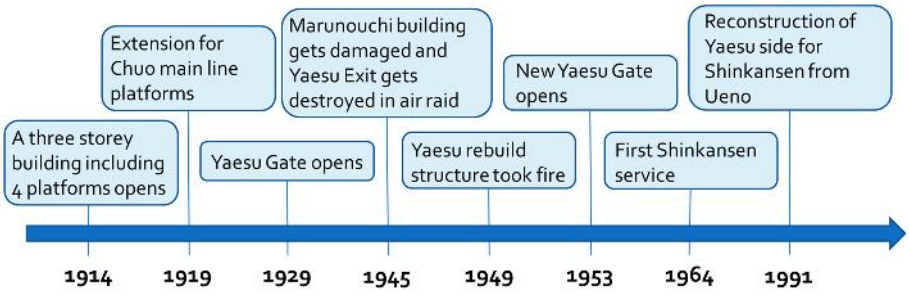


Figure 6.6 History of Tokyo Station.

Finally construction started in March 1908 and was completed in 1914. The station was designed as a three storey "red brick" structure, spanning approximately 335 m[172] in length with a total floor area of 23,900 m^2[173]. A prominent boulevard connected the station with the Emperor's palace. Two domes, one in the north wing and one in the south wing dominated the building. The north dome was used for departures whereas the south dome was for arrivals. The royal family exclusively used the main entrance.

[170] Preservation and Restoration of Tokyo Station Marunouchi Building, Masahiko Nakai, 2013, Page 7

[171] Preservation and Restoration of Tokyo Station Marunouchi Building, Masahiko Nakai, 2013, Page 7

[172] Preservation and Restoration of Tokyo Station Marunouchi Building, Masahiko Nakai, 2013, Page 7

[173] Preservation and Restoration of Tokyo Station Marunouchi Building, Masahiko Nakai, 2013, Page 7

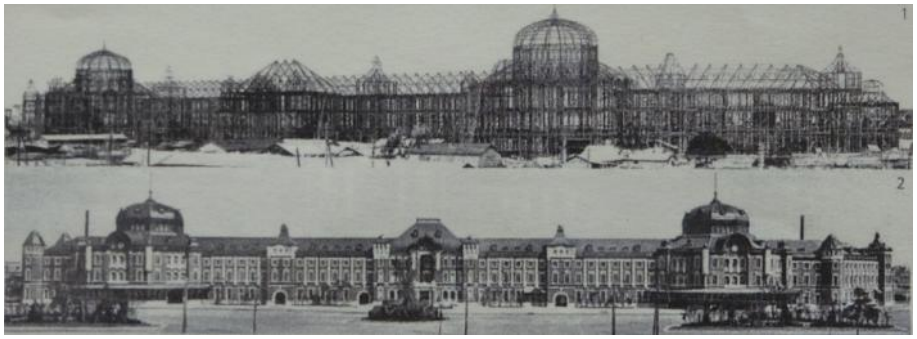


Figure 6.7 Tokyo station under construction and after completion. [174]

The first floor included waiting rooms for passengers and luggage, private apartments for the royal family and the stationmaster's office. The second and third floors housed a hotel and a restaurant, in the north wing the offices of the Railway Agency.

Figure 6.8 Photograph of the original facade. [175]

In 1923 the Great Kanto Earthquake, leaving vast areas of the city in ruins, struck Tokyo. In the surrounding area of Tokyo station several buildings collapsed due to damages caused by earthquake and fires. However Tokyo station remained unharmed. WW II Tokyo station was hit by bombs and was severely damaged. In the postwar era the structure

[174] History of Tokyo Station, Folder by JR East

[175] History of Tokyo Station, Folder by JR East

was not restored in its original form. The new design included only two floors and the round domes where rebuilt in octagonal shape.

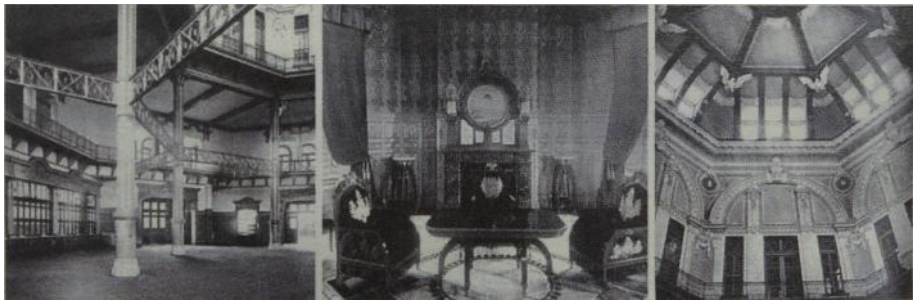


Figure 6.9 Details of the original interior design. [176]

6.3 Project Overview

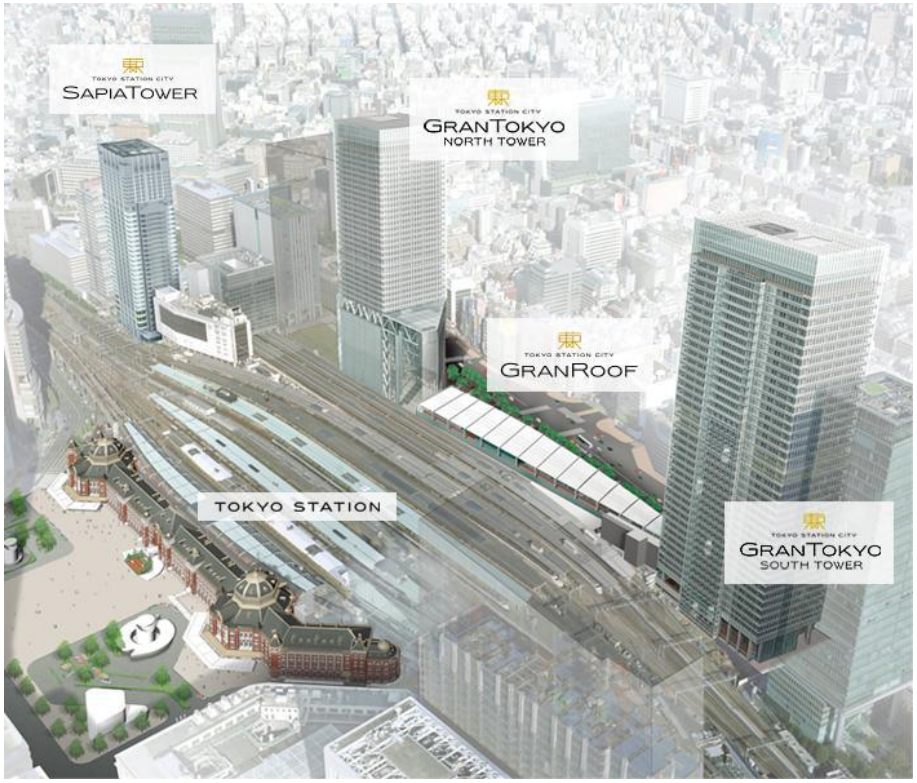


Figure 6.10 Overall Image Tokyo Station. [177]

[176] History of Tokyo Station, Folder by JR East

[177] http://www.tokyostationcity.com/ on the December, 9th, 2013

Located in the heart of the central business district the modern design contributes to the flair of the city. There are three entrances, North, West and East, each representing a different attribute.

Marunouchi side in the west represents history and culture. The redbrick building, representative of Japanese architecture, was restored with regard to the policy of permanent restoration to its original three-storey form with north and south dome. The station front plaza was redesigned to meet modern traffic needs. The "Gyoko-dori" – a wide prominent boulevard in front of the building – is connecting the station with the imperial palace and forming an outstanding axis of urban landscape called the "Gateway of Japan".

Nihonbashi side in the north represents research and education. The Sapia Tower a high-rise building with a height of 170 m[178] and 35 storeys[179] above ground was erected. Sapia Tower contains offices occupied by universities and research companies, a hotel, and conference facilities supporting education and enhancing exchange of knowledge.

Yaesu side in the east represents business and commerce. In a joint project with landowners and leaseholders JR East constructed twin high-rise towers connected by a central station building with a pedestrian sky deck creating a new look for the less developed Yaesu side. The twin towers, with a height of 205 m[180] each, have been designed to reflect transparency and lightness of glass structures connected by a sky deck covered by a thin membrane structure representing "crystal towers in light" and "sail of light"[181]. The station front plaza was extended and traffic linkage improved.

Table 6.1 General information on Tokyo Station City Project

Building	Structure	Floors	Height	Total floor area
Sapia Tower	Steel-reinforced concrete	4 storeys under, 34 storeys above ground	170 m	79,200 m^2 [182]
North Tower	Steel frame, reinforced concrete	4 storeys under, 43 storeys above ground	205 m	216,540 m^2 [183]

[178] JR East Press Release March 2nd, 2004

[179] JR East Press Release March 2nd, 2004

[180] JR East Press Release September 10th, 2004

[181] Aiming for the Creation of new space – Development of Tokyo Station City, Atsuo Maeda, Page 6

[182] JR East Press Release March 2nd, 2004

[183] JR East Press Release September 10th, 2004

South Tower	Steel frame, reinforced concrete	4 storeys under, 42 storeys above ground	205 m	140,170 m^2 [184]
Marunouchi building	Reinforced brick	2 storeys under, 3 storeys above ground	46 m	43,000 m^2 [185]

Together the three exits connected by a central passageway under the railway tracks form a complex of structures called Tokyo Station City, which was designed under the aspects of

- Symbolizing history by means of restoring a government designated outstanding cultural property, Marunouchi Station Building to its original form. [186]
- Symbolizing future by creating *GranTokyo*, a center of business and commerce, on the Yaesu-side. [187]
- Disseminating information by the establishing of a centre for research, development, and education with the *SapiaTower* at Nihonbashi gate. [188]
- Linking town by development of the *GranSta* mall – a large space within the ticket gates connecting Marunouchi and Yaesu. [189]

[184] JR East Press Release September 10th, 2004

[185] JR East Press Release May 8th, 2007

[186] Upgrading Yaesu-Side of Tokyo Station, Atsushi Kaise, 2010, Page 8

[187] Upgrading Yaesu-Side of Tokyo Station, Atsushi Kaise, 2010, Page 8

[188] Upgrading Yaesu-Side of Tokyo Station, Atsushi Kaise, 2010, Page 8

[189] Upgrading Yaesu-Side of Tokyo Station, Atsushi Kaise, 2010, Page 8

6.3.1 Marunouchi Exit

Figure 6.11 Marunouchi Building. [190]

The well-known structure designed by Kingo Tatsuno in the famous “red-brick” style of the Meiji era was struck by an air raid on May 25th 1945 and severely damaged. Soon after WW II the Railway Transportation Office (RTO) of occupying Allied forces located their headquarters within the stations halls. In October full-scale restoration work began and was completed in 1947. Being representative of Japanese early 20th century architecture and forming a significant axis of urban landscape with the imperial palace the structure lost its original form and was changed into a two-storey building with north and south dome converted to an octagonal shape. Whereas the station’s facilities were adapted and extended the Marunouchi building remained in its shape of 1947. In the early 2000’s JR East commissioned several studies to modernize the facility. In 2001 TMG established the “Research Committee for Regeneration and Improvement of Tokyo Station Area” [191] chaired by Waseda University Professor Shigero Ito. In December 2001 the committee handed over its final report favouring a preservation of the Marunouchi building. The committee made several recommendations regarding improvement of the station plaza, relocating building capacity and improvement of infrastructure. In 2002 based on these recommendations JR East announced its decision to restore the building in its original form. Thus JR East followed a policy of permanent restoration and utilization of the building.

[190] JR East Press Release May 8th, 2007

[191] Source JR East

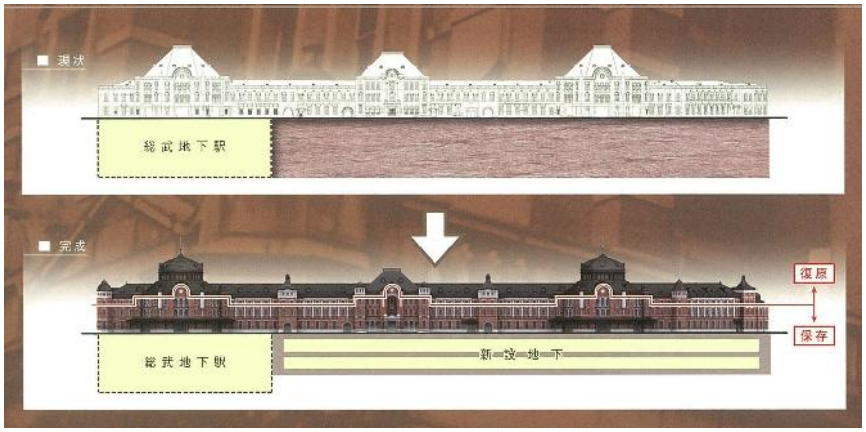


Figure 6.12 Restoration of Marunouchi building. [192]

Soon after the announcement JR East conducted research about historical design and installed the Committee for Historic Preservation. A first concept was drafted. The plan included restoring the third floor and roof with its notable form and the round shaped north and south dome as well as two additional underground floors allowing increased functionality and an expansion of underground passageways. Aseismic-retrofitting reinforcing the existing reinforced brick structure should improve earthquake resistance and safety.

[192] Source JR East

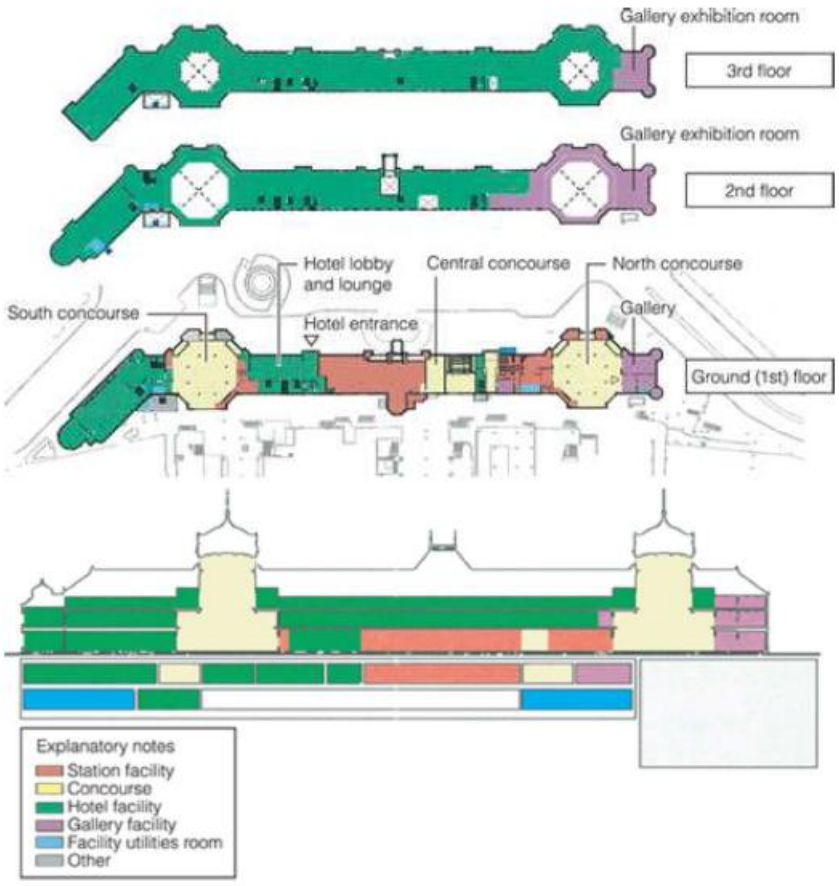


Figure 6.13 Facilities within Marunouchi building. [193]

Since the station opened its doors for the first time the building has been used as station and hotel. In 1988 the station gallery was added. When it was decided to restore the building it was planned that facilities should be maintained in its original form. Figure 6.13 shows the space concept for the restored building.

[193] JR East Press Release May 8th, 2007

6.3.2 Yaesu Exit

Figure 6.14 Yaesu Exit with North and South Tower. [194]

Opened in 1929 the original structure located on the east side of Tokyo Station the Yaesu Exit enabled access to the Yaesu district representing an important hub for the east side business district. During WW II the building was damaged and reconstruction took place during the postwar era. After being in service for only one year the building burned down in 1949. Construction on a new structure began in 1952 and was completed in 1953. The new structure connected with the newly opened shopping mall Tetsudo Kaikan opened in 1954. However the 12-storey building proved to be inadequate and its position reduced space for extension and made vertical expansion necessary. The transportation hub on Yaesu side also suffered from lack of a suitable station front plaza. To tackle these issues JR East were confronted with shortage of available land on the Yaesu side. JR East's development plan included two high-rise towers connected by a central wing (See Figure 2.2) representing the largest part of the TSC Project. In order to acquire sufficient land a joint venture with adjacent landowners was achieved.

[194] JR East Press Release November 6th, 2003

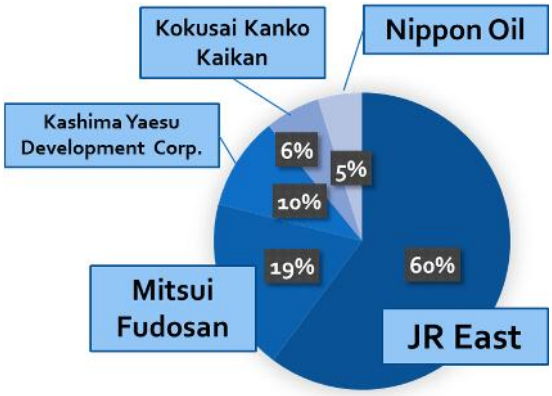


Figure 6.15 Shares of companies of the Yaesu Development Project Joint Venture. [195]

Kokusai Kanko Kaikan and Mitsui Fudosan held shares of the Tetsudo Kaikan Shopping Mall. Nippon Oil was owner of a gasoline station on the Yaesu side and Kashima Yaesu Development Corp. owned a lot on the south side. In Figure 5.4 each company's share on the Yaesu Development Project is listed. Shares are equal to their value of land and amount of investment.

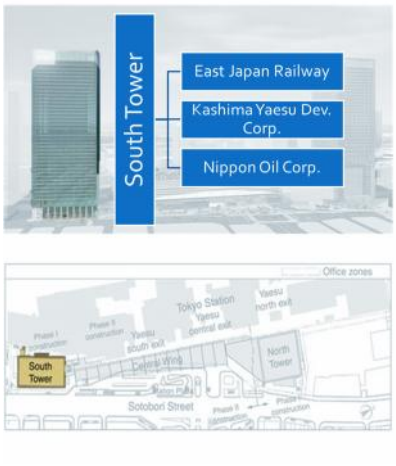
Finally JR East started with detailed plans for the Yaesu Exit. The basic design concept was already set and in 2004 it was announced:

> *The Yaesu side of Tokyo station will form an "entryway to the future" with an innovative, advanced, and cutting-edge urban space created by twin towers, built with liberal amounts of glass, and connected by a bright expansive central wing covered by a large awning.* [196]

The two high-rise glass towers would include large office space, while the lower central wing contains a passageway connecting the towers, a shopping mall and station facilities. This complex should extend JR East's assets on the Yaesu side and act as a trigger to boost development there, giving the district a modern appearance.

[195] Own Figure, Source: JR East Press Release March 2nd, 2004

[196] JR East Press Release September 10th, 2004



Construction Period	Phase I
Plot Area	5,229.54 m²
Building Area	3,717.09 m²
Ground Cover Ratio	71%
Total Floor Area	140,168.07 m²
Floor Area Ratio	2,680%
Building Height	205 m
No of floors	42 above ground 4 underground
Office Lease	75,000 m²
Shop space	1,000 m²
Contractor	Kajima Shimizu Taisei Tekken
Building structure	Steel frame, reinforced concrete

Figure 6.16 South Tower of Yaesu Development Project. [197]

The Tokyo station is located in a commercial zone with a FAR of 1,300 % [198] being the maximum value allowed by law. Different from the surrounding area the lot of the station is specified with 900 % [199]. However the former structure only covered 200 % [200], leaving the remaining 700 %[201] unused. JR East as owner of the remaining 700 % received permission to transfer FAR rights. This was the first time that building authorities made use of the 2002 laws for a project and allowed such transfer. The law allowing extended transfer of rights from adjacent blocks to a certain area. This made it possible for JR East to transfer FAR to undeveloped Yaesu side. Consequently JR East transferred 360 %[202] to the Yaesu side in order to construct the North and South Tower. The twin towers with a total building height of 205 m are much higher than officially allowed by law. This was possible due to combined use of transfer of rights and the integral design instrument. This integral design instrument grants an additional FAR Bonus if a certain amount of land is open to the public, therefore JR East planned a pedestrian passageway. In the Yaesu Development Project a FAR-value of approximately 1,650 %[203] was used, 750 % higher than officially allowed. The original FAR value of 900 % was extended by 390 % [204] due to this pedestrian passage and 360 % due to the transfer of rights, which made up a total

[197] Own Figure, Source: JR East Press Release March 2nd, 2004

[198] Station area developments in Tokyo and what the Randstad can learn from it, Chorus, 2012, Page 185

[199] Station area developments in Tokyo and what the Randstad can learn from it, Chorus, 2012, Page 185

[200] Station area developments in Tokyo and what the Randstad can learn from it, Chorus, 2012, Page 185

[201] Station area developments in Tokyo and what the Randstad can learn from it, Chorus, 2012, Page 185

[202] Station area developments in Tokyo and what the Randstad can learn from it, Chorus, 2012, Page 185

[203] Station area developments in Tokyo and what the Randstad can learn from it, Chorus, 2012, Page 186

[204] Station area developments in Tokyo and what the Randstad can learn from it, Chorus, 2012, Page 185

FAR of 1,650 %. Liberal interpretation of FAR Bonus laws and support authorities to design the modern Yaesu side boosted the planning process.

	North Tower		Central Wing
Construction Period	Phase I	Phase II	Phase II
Plot Area	14,439.18 m²		
Building Area	12,795.01 m²		
Groud Cover Ratio	88%		
Total Floor Area	216,543.47 m²		
Floor Area Ratio	1,500%		
Height	205 m	70 m	27 m
No of floors	42 above 4 under	14 above 4 under	43 above 4 under
Office Lease	63,000 m²		
Shop space	45,000 m²		2,000 m²
Contractor	Kajima, Obayashi, Taisei, Takenaka, Tekken, Shimizu, Sumitomo		
Structure	Steel frame, reinforced concrete		

Figure 6.17 North Tower and Central Wing of Yaesu Development Project. [205]

The twin towers with a total floor area of over 356,000 m² would be an ideal complement to the low-storey redbrick station building on the Marunouchi side and combine modern design with Japan's industrial past. Not only did it create a symbiosis between modern and industrial age Japan, it also extended the axis from the imperial palace as center of Japanese tradition to modern high-rise commercial centre of Tokyo station.

	Yaesu North and South Tower
Original FAR-values	900%
Additional FAR:	390% (rough estimation)
a) Pedestrian passage	
Total FAR-value after bonus	1290%
FAR transfer	360%
Final FAR-value	*1650%*

Figure 6.18 FAR-value of Yaesu Development Project. [206]

[205] Own Figure, Source: JR East Press Release March 2nd, 2004

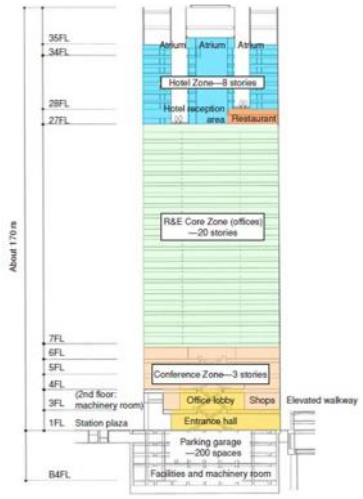
[206] Station area developments in Tokyo and what the Randstad can learn from it, Chorus, 2012, Page 185

6.3.3 Sapia Tower

Figure 6.19 Sapia Tower. [207]

As part of the Tokyo Station City Project the Nihonbashi exit, which so far was poorly developed, should become a center for research and knowledge transfer. Therefore JR East had a modern 34 floor high-rise glass tower designed. By easy access to the nationwide Shinkansen system the R&E center is connected with most of the major cities of Japan. This advantage and the location within the center of Tokyo's business districts helped to establish an R&E center in which knowledge transfer between nationally and internationally operating companies and universities can evolve freely. To support scientific and interdisciplinary exchange JR East planned the Sapia Tower including a hotel zone, a conference zone and an office zone with optical-fiber cables, extended ventilation system as well as a first-rate security system. The 170 m high structure with a total floor space of about 79,200 m² is exclusively operated by JR East.

[207] JR East Press Release March 2nd, 2004



Strucutre	Steel-reinforced concrete	
Floors	4 stories underground	
	34 stories above ground	
Height	170 m	
Total floor area	79,200 m²	
Usage Composition	Office Zone	30,600 m²
	Conference Zone	2,100 m²
	Hotel Zone	400 rooms
	Shops	800 m²
	Parking Area	for 200 vehicles
Construction period	September 2004 - March 2007	
	31 Month	

Figure 6.20 Sapia Tower. [208]

6.3.4 GranSta and South- & NorthCourt

GranSta is a passageway connecting Marunouchi and Yaesu districts. Besides its function as passageway, also a shopping mall is located within. GranSta has a total floor area of 4,500 m² [209]. 1,500 m² [210] are used for high quality stores with focus on travelers such as delicatessen, confectioners, bakeries, cafes and high quality grocery stores, allowing JR East to make use of the economic potential of everyday passengers. Passengers should be able to shop and eat within the station. For JR East the name GranSta expresses several different meanings:

> *GranSta is a word coined using the combination of "grand" and "sta," the latter of which is intended to convey the meaning of four different words it starts. GranSta is meant to describe an inside-station area befitting of Tokyo Station, the central station in the nation's capital.* [211]

- *Station: The heart of the Tokyo Station City development project*
- *Status: Status befitting of Tokyo as the capital of Japan*
- *Start: Starting point for building pre-trip anticipation*
- *Stage: Stage creates memories for the many people passing by* [212]

[208] Own Figure, Source: JR East Press Release March 2nd, 2004

[209] JR East Press Release July 3rd, 2007

[210] JR East Press Release July 3rd, 2007

[211] JR East Press Release July 3rd, 2007

[212] JR East Press Release July 3rd, 2007

While Gransta is located in the basement, South- and NorthCourt are located on the first floor within ticket gates. South- and NorthCourt have been designed as two commercial promotion spaces with a total development area of 2,900 m², a planned shop area of about 2,300 m² on first floor underneath platforms. Expected sales for all three shopping areas are ¥13.6 billion per annum.

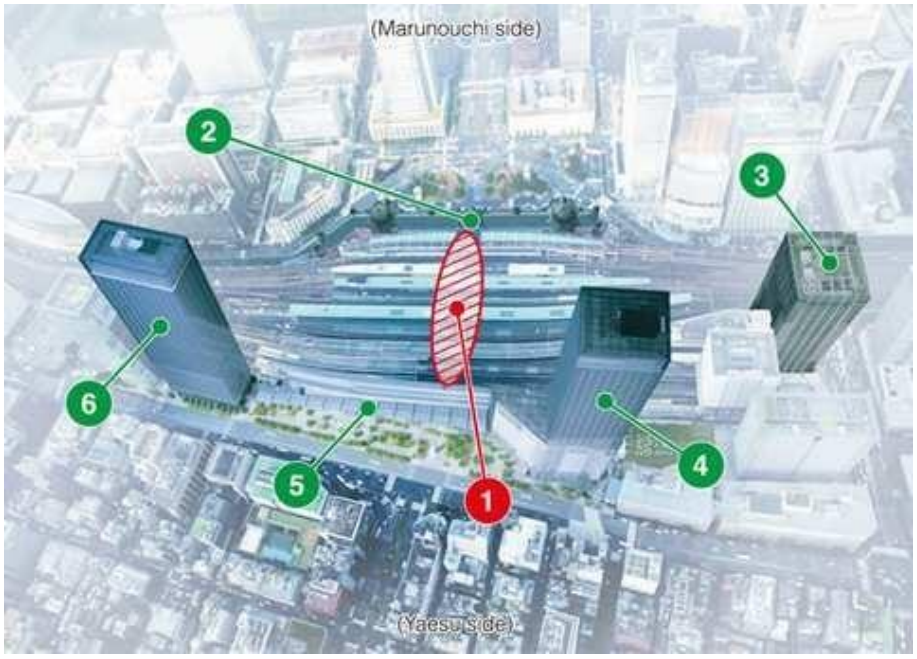


Figure 6.21 GranSta. [213]

6.4 Stakeholders

6.4.1 Tokyo Metropolitan Government

Tokyo Metropolitan Government governs all of Tokyo prefecture the 23 special wards including. One of its principal tasks is to ensure responsible development. Therefore TMG represented by the Bureau of Urban Development sets urban development policy, establishes regulation, devises future plans and observes on-going and future projects. TMG shows great interest in redevelopment of Tokyo Station. With its prominent location and its function as central hub for the central business district is an essential key point in TMG's vision of future Tokyo. The bureau was constantly monitoring the progress of CBD and the

[213] JR East Press Release March 6nd, 2007

situation of the station, so concerns about the aging structure unable to meet current and future needs gradually increased. Several essential issues had to be tackled.

- The station front plaza losing functionality and unable to satisfy modern traffic demand. [214]
- The need for a land use system, able to meet areas development movement. [215]
- The station not efficient for meeting increased travel demand. [216]
- Creating a new appearance of Tokyo's central business district and guiding the city into 21st century. [217]

TMG established the Committee for Revitalizing Area around Tokyo Station chaired by Waseda University Professor Shigeru Itoh[218]. The committee's final report suggested restoration of the Marunouchi building, improvement of the station front plaza, methods of transferring building capacity, and plans to improve infrastructure surrounding the station. Based on this report TMG set its policy for the area and started planning for infrastructure improvement of surrounding area. Following a policy of preservation TMG supported JR East in its plans. Outcome of talks between JR East and TMG resulted in Tokyo station designated as FAR exemption and transfer of FAR rights permitted. This made it possible for JR East to construct high-rise towers and to sell FAR rights to adjacent properties.

6.4.2 Ministry of Land, Infrastructure, Transport and Tourism

Tokyo takes a central position in social and economic visions of national government. The Ministry of Land, Infrastructure, Transport and Tourism is responsible for land-use planning, construction and public transport. Tokyo station as part of the inner loop line and being the city major Shinkansen station has an exorbitant passenger frequency. Congestion and insufficient infrastructure increased problems another being the significance of stations as landmark buildings in the nation's capital. Being aware of the insufficient situation at Tokyo station and changing urban landscape MLIT deviseds the idea of a "Gateway of Japan" in operation with TMG. As a major stakeholder MLIT participated in the

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6z[214] Aiming for the Creation of new space – Development of Tokyo Station City, Atsuo Maeda, Page 5

[215] Aiming for the Creation of new space – Development of Tokyo Station City, Atsuo Maeda, Page 5

[216] Memorandum of Kuniaki Mitani, Deputy General Manager, Station Development Planning Department, JR East

[217] Memorandum of Kuniaki Mitani, Deputy General Manager, Station Development Planning Department, JR East

[218] Memorandum of Kuniaki Mitani, Deputy General Manager, Station Development Planning Department, JR East

Committee for Revitalizing Area around Tokyo Station and contributed in transfer of FAR rights. [219]

6.4.3 Administration of Chuo & Chiyoda ward

Large-scale redevelopment projects usually have considerble effects on surrounding areas. Change of passenger attitude in a major station can directly and indirectly change the area's features. As the station is situated in Chuo and Chiyoda ward consequently for authorities there redevelopment of Tokyo station is of great interest. While the Marunouchi gate is in Chiyoda ward, Nihonbashi and Yaesu gate are situated in Chuo ward.

Right in the centre of Chiyoda ward is the imperial palace. With its immense national importance urban planning policy focuses on responsible development thoroughly considering this status. Tokyo station's prominent location facing the palace and forming an urban axis with Gyoko-dori is Chiyoda's main public transportation hub. In 1998 Chiyoda instituted its urban master plan including design of a double circular traffic route system with an inner circle around the palace and an outer ring encircling the ward with lines connecting adjacent wards and bypasses. Thus Tokyo station became the central hub for the Otemachi-Marunouchi-Yurakucho business district providing effective public transportation service. Another feature of Chiyoda's urban master plan is to ensure the visual axis towards the imperial palace. Therefore development projects within Chiyoda ward have to be designed guaranteeing unobstructed view. With decreasing distance to the palace building height is limited and it is requested to prevent obstruction of existing visual axis. Furthermore being Tokyo's central business district it is imminent of importance to further extend Chiyoda's advance as center of business and commerce and to decrease enormous day and night frequency of population. To do so it became necessary to support mixed land use providing sufficient housing, excellent transportation services, leisure and commercial facilities.

[219] Memorandum of Kuniaki Mitani, Deputy General Manager, Station Development Planning Department, JR East

Figure 6.22 Master plan of Chiyoda ward. [220]

Chuo ward with its famous Ginza district is the historic commercial center of Tokyo. However, vast areas of the ward are still underdeveloped or have to be redeveloped and due to the Tokyo Olympic Games 2020 Chuo ward focuses on development of Yaesu and its waterfront. Therefore the Yaesu area was declared Special Urban Renaissance District with FAR Bonus of up to 900 %[221] and the waterfront area along the Sumida River was proclaimed Urban Renaissance Emergency Development Area with FAR bonus of up to 800 %[222]. However to boost development in the Yaesu district an adequate central transportation hub was missing. Although Tokyo Station had insufficient capacities and access from Yaesu district was inappropriate, it seemed to be the right choice. It was Chuo's chance to promote redevelopment of Tokyo

[220] Source: Chuo ward administration, 2014

[221] Source: Chuo ward administration, 2014

[222] Source: Chuo ward administration, 2014

Station with extended exit on the Yaesu side and with Nihonbahsi gate there would be access to the station from two sides.

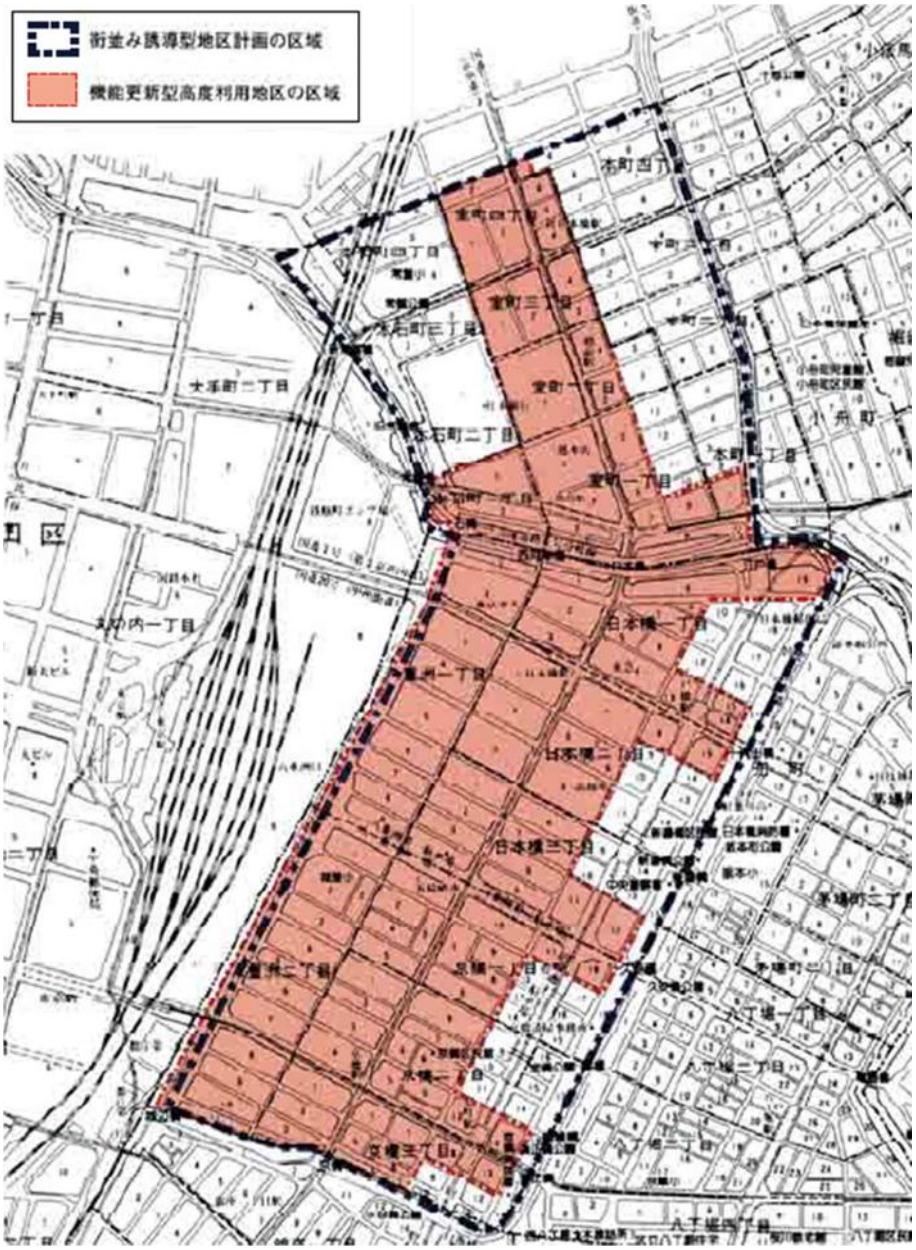


Figure 6.23 Yaesu - Special Urban Renaissance Districts. [223]

[223] Source: Chuo ward administration, 2014

6.4.4 JR East

When JR East was formed in 1987 also Tokyo station was acquired. As new owner of the station JR East was interested in making optimal use of its property. Originally the station was designed for an estimated maximum capacity of 12,000 [224] passengers per day. In 2013 after completion of the redevelopment work approximately 800,000 passengers used Tokyo station daily. So the average daily passenger earning of about ¥260 million [225] in 2013 exceed any other JR East station. Turnovers generated by shops in Tokyo station increased 12.3 % yearly to over ¥4.0 billion in 2013. To extend the stations capacity to modern demands and to make use of the enormous economic passenger potential it was necessary to redevelop the entire station with a station front plaza on Yaesu and Marunouchi side as well as to redesign Nihonbashi gate and the passage way to connect Yaesu with Marunouchi district. JR East formulated several objectives to be achieved by redevelopment.

- Increase capacity to meet modern demands
- Reorganize routing from Yaesu to Marunouchi and Nihonbashi side
- Redevelop station front plaza on Marunouchi side
- Development easy access on Yaesu side
- Acquisition of economic passenger potential
- Create a powerful symbol representing JR East as modern company with traditional roots

Several plans were produced, however, none of the proposed projects was regarded suitable. The main issue JR East had to tackle was the shortage of land the company owned on Yaesu side. [226]

6.4.5 Landowners

On Marunouchi and Yaesu side several major Japanese companies hold vast properties. Especially Mitsubishi Estate and Mitsui Fudosan, which hold most of the properties, showed massive interest in redevelopment of Tokyo station. On Yaesu side adjacent landowners Nippon Oil, Kokusai Kanko Kaikan and Kashima Yaesu Development Corp saw possibilities to increase the value of their land. To be able to develop Yaesu side JR East had to negotiate with Mitsui, Nippon Oil, Kokusai

[224] Geographic Study of Historic Preservation: Evolving Cultural Landscape and Development of Modern Japan, Page 97

[225] Aiming for the creation of new space – Development of Tokyo Station City, Page 2

[226] Memorandum of Kuniaki Mitani, Deputy General Manager, Station Development Planning Department, JR East

and Kashima. Being the only high value object on Yaesu side the owners of 12-storey Tetsudo Kaikan Building were eager to improve their property. For all parties involved on the Yaesu side it seemed obvious to form a joint venture in order to achieve their goals. Since 2000 landowners invested enormously in their property on Marunouchi side and modernized the entire area, especially Mitsubishi Estate. Besides construction of high-rise office towers private investors also widened streets, planted greenery and constructed underground passages. However in order to have an easy access to the area and to generate sufficient pedestrian frequency an appropriate central hub with a large square was still missing. This resulted in extensive support by landowners for the Tokyo Station City Project. [227]

[227] Memorandum of Kuniaki Mitani, Deputy General Manager, Station Development Planning Department, JR East

6.5 Timeline

At the beginning of 2001 Tokyo Metropolitan Government established the Committee for Revitalizing Area around Tokyo Station chaired by Waseda University Professor Shigeru Itoh. In December the committee finished its work and submitted a final report proposing redevelopment of Tokyo station and restoration of Marunouchi building. On February 15th 2002 JR East announced its plan to restore the building to its original form and established the Committee for Historic Preservation with the task to conduct research about the historic design. Talks with TMG regarding redevelopment were held and on October 1st TMG designated Tokyo Station as FAR District Exemption. With awareness of its cultural value increasing Marunouchi building was proclaimed important cultural property, further increasing the company's efforts to restore the structure. TMG decided to revitalize the surrounding public space. On November 6th 2003 JR East announced their plan to develop Yaesu side and construct twin high-rise towers connected by a station building. On March 2nd the company published of the development activities on the Nihonbashi side, where a R&D center would be established. Finally, in summer 2004 construction work of Phase I on Yaesu side began and in autumn construction work on Nihonbashi side started. On March 8th 2007 Sapia Tower on Nihonbashi side opened and on May 30th restoration work on Marunouchi building started. In October 2007 Phase I of Yaesu side with North and South tower as well as the passageway between ticket gates connecting different gates was completed. In summer 2008 Phase II of North Tower on Yaesu side was started. On March 11 2011 the Great East Japan Earthquake – the Tohoku Earthquake – struck with a magnitude of 9.0 and caused a massive Tsunami killing more than 20,000 people. Fortunately seismic retrofitting on the Marunouchi building was completed in 2010 leaving the unfinished structure unharmed. However sections essential of the historic building were washed away causing delay. The rescheduled timetable for restoration work calculated completion for October 2012. Twelve days after the earthquake struck leaving Japan in a state of shock on March 23rd JR East could open the southern part of GranRoof on Yaesu side in advance. On October 1st 2012 work on Marunouchi building was completed and on 3rd the station hotel opened its doors. Finally, in spring 2013 Phase II of North Tower on Yaesu side was completed marking completion of the project.

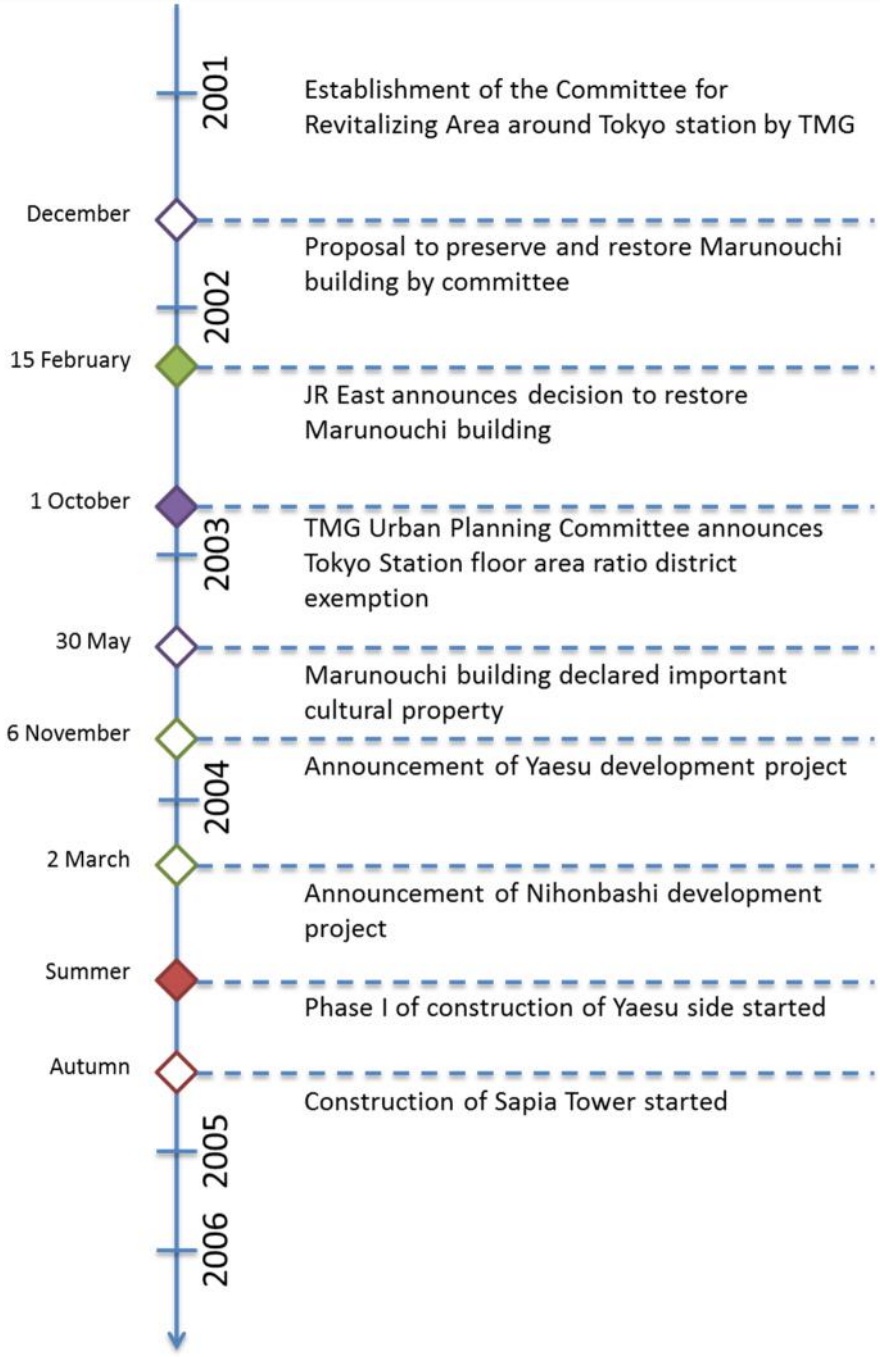


Figure 6.24 Timeline of Tokyo Station City project – Part 1. [228]

[228] Own Figure, Source JR East

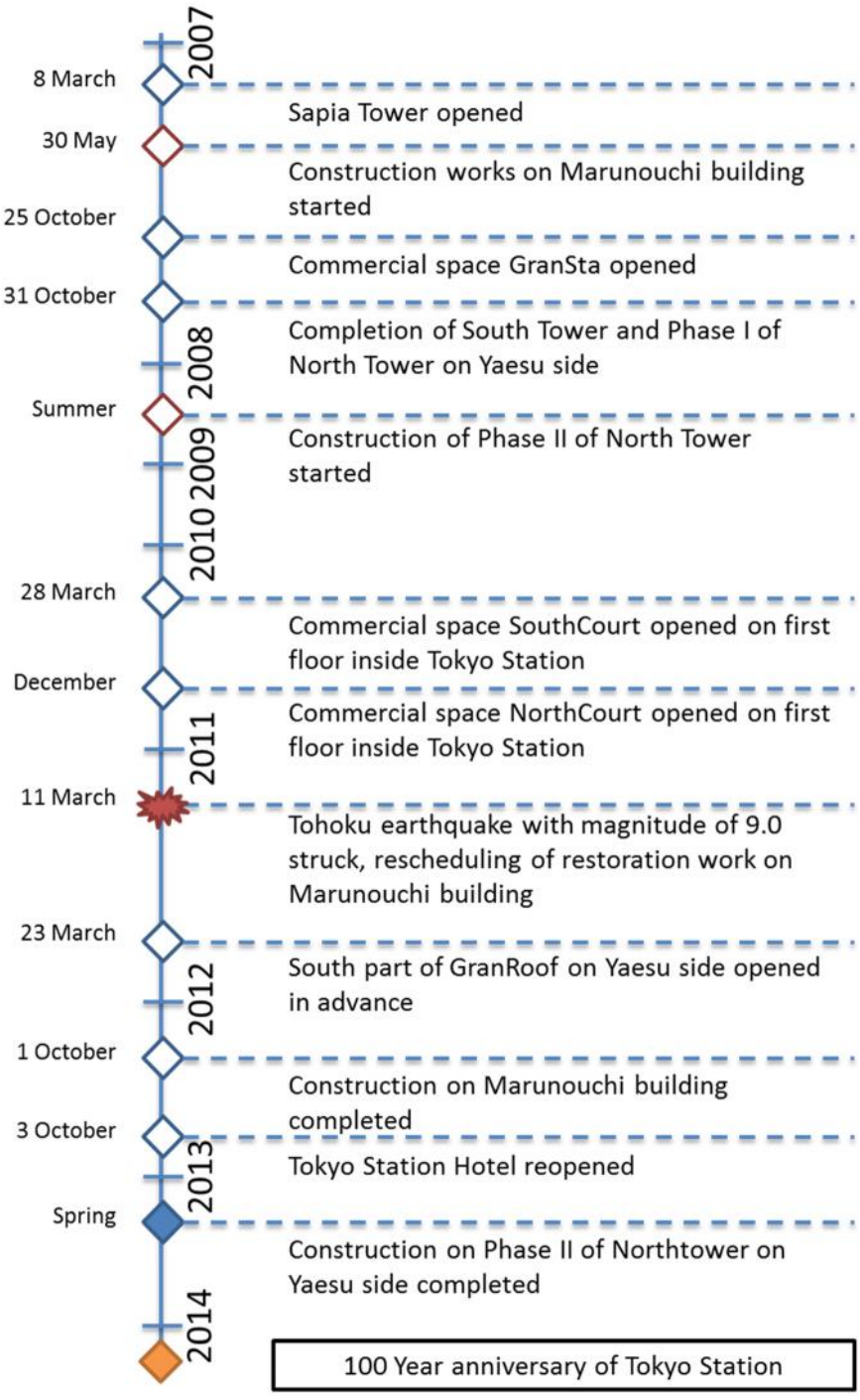


Figure 6.25 Timeline of Tokyo Station City project – Part 2. [229]

[229] Own Figure, Source JR East

6.6 Decision Making Process

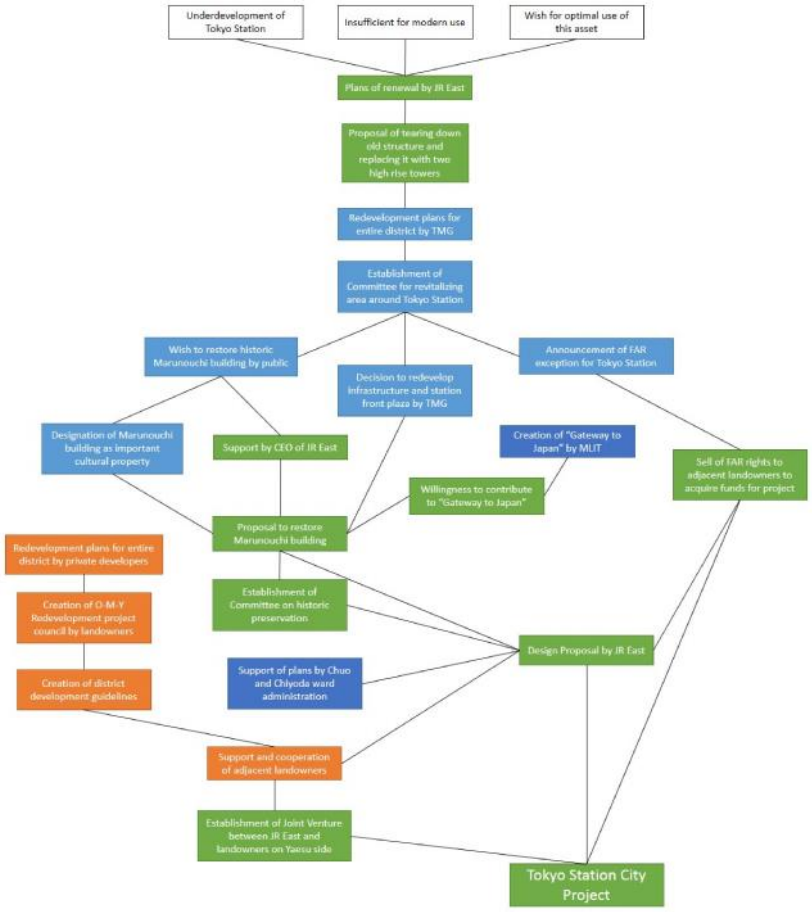


Figure 6.26 Decision Making Process. [230]

Figure 6.28 shows decision making process by JR East and stakeholders' intervention on Tokyo Station City Project. Boxes coloured correspond with individual stakeholders, green for JR East, light blue for TMG, dark blue for other authorities and orange for adjacent landowners. White boxes illustrate major problems due to aging structure.

[230] Own Figure, Source JR East

JR East was long time aware of the issues Tokyo Station was facing and announced plans of renewal in the 1990s. First proposals included replacement of Marunouchi building by two high-rise glass towers. However due to insufficient planning and shortage of land JR East withdrew plans and stopped the project. With landowners' urging to redevelop the district in the late 1990's TMG saw an opportunity to provide Tokyo Station and its surroundings with a modern appearance and established the Committee on Revitalizing Area around Tokyo Station in 2001. Before setting up of this committee landowners encouraged by Mitsubishi Real Estate formed O-M-Y Redevelopment Project Council to define guidelines for the area. However, it was the TMG direct involvement which enabling redevelopment on a broader scale in the area. Moreover, with JR East proposal to restore Marunouchi building to its original form and with TMG decision to redevelop district infrastructure and to declare Station FAR exception, it can be said that the committee's initiatives were essential for the further course of action. Approving FAR exception made selling FAR rights to adjacent lots possible. Selling FAR rights generated remarkable profits and allowed JR East spending generously on the restoration of the historic structure. Comparing cost per square meter Marunouchi Site, with 1,190 thousand ¥/m^2 (total estimated costs of ¥ 50.0 billion) was more than twice as expensive as Yaesu Site, with 365.0 thousand ¥/m^2 (total estimated costs of ¥ 130.0 billion). Another important factor was the formation of a joint-venture between JR East and landowners on Yaesu site. JR East suffered from shortage of land on Yaesu side, however to realize the project it was essential to acquire sufficient land on the side. Three favorable conditions facilitated decision JR East's to redevelop Tokyo Station

- Approval of FAR exception
- Joint-venture with adjacent landowners on Yaesu side
- TMG decision to redevelop surrounding infrastructure

Additionally it has to be remarked that the entire project was planned and construction was supervised by internal departments enabling JR East a smooth and flexible decision making process and quick adjustment during design and construction stage.

JR East departments involved[231]

- Investment Planning Department
- Construction Department
- Life-Style Business Development Headquarters

[231] Memorandum of Kuniaki Mitani, Deputy General Manager, Station Development Planning Department, JR East

- Station Planning Department
- Facilities Department
- Tokyo Construction Office

JR East subsidiaries involved[232]

- JR East Design Corporation
- JR East Consultant Company

6.7 Preservation of Marunouchi building

Historical red-brick architecture is characteristic for late 19th century and early 20th century Japanese building patterns and wide-spread in Tokyo's main business district Marunouchi. Gradually surrounding buildings were replaced by modern glass-steel-concrete constructions and Tokyo station red-brick Marunouchi building was left as symbol of Japan's era of economic expansion. It survived the Great Kanto earthquake, WW II and several attempts to tear down the structure during the 1960s and 1970s. Due to the spreading movement of preserving historical and cultural property in Japan voices were raised to preserve and restore outdated structures which carried significant national memories. Public support enhanced government intervention to restore the building to its old glory. It was planned to use the building with the station front plaza as a "Gateway to Japan". Therefore a TMG committee chaired by Prof. Shigeru Itoh from Waseda University was requested to propose a regeneration plan for the station and its surroundings. The committee, involving the station owner JR East, were in favour for restoration and made several recommendations for proper preservation. Based on the committee's final report TMG took immediate action.

[232] Memorandum of Kuniaki Mitani, Deputy General Manager, Station Development Planning Department, JR East

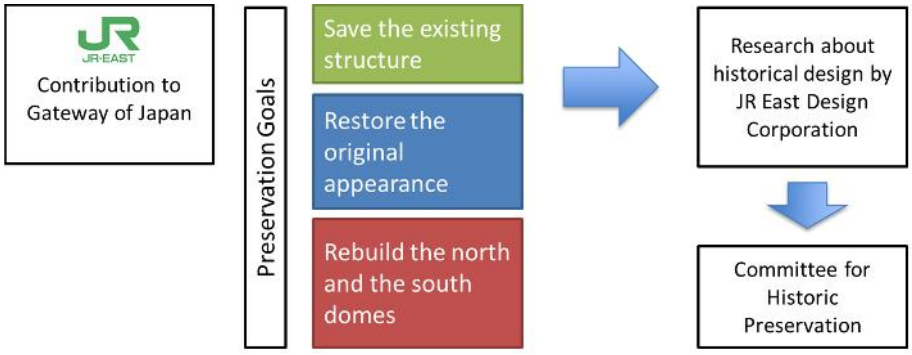


Figure 6.27 Contribution to Gateway of Japan by JR East. [233]

JR East defined three main goals in order to realize the idea of a Gateway to Japan:

- Save the existing structure[234]
- Restore original appearance[235]
- Rebuild the north and the south domes[236]

To restore the structure in its original form a Committee for Historic Preservation was established to carry out research about the building's historic design and to adapt technical solutions to upcoming issues.

6.7.1 Overview

The Marunouchi Building is a three storey-building with hipped roof with a central and two side portals and asymmetrical endings with a total length of 335.0 m. Architectural description is based on the station front plaza façade. (see Figure 6.30)

Central Portal

The central portal consists of a square shaped structure with an elevated hipped roof cornered by two single-axis four-storey winged pavilions. The elevated entrance is positioned in three-axis projection flanked by three-axis wings with colonnades in the lower floor. Above the entrance there is a one-axis wide half-circled arch containing a clock.

Connection Wings

[233] Own Figure, Source JR East

[234] Memorandum of Kuniaki Mitani, Deputy General Manager, Station Development Planning Department, JR East

[235] Memorandum of Kuniaki Mitani, Deputy General Manager, Station Development Planning Department, JR East

[236] Memorandum of Kuniaki Mitani, Deputy General Manager, Station Development Planning Department, JR East

The north and south portals are connected by fifteen-axis long three-storey high wings. The third floor is a mezzanine construction. On the passage between building and roof is a balustrade. The northern connection wing has a two-axis wide entrance adjacent to the central portal. In axis 8 and 9, counted from the central portal, there is a projected entrance. Adjacent to the central portal side there are five dormer windows, first and fifth elevated. On the side adjacent to the north dome there are four dormer windows, first and forth elevated. The southern connection wing has a two-axis wide entrance between axis 5 and 6, left to the central portal. Axis 7 and 8 contain a projected two-axis wide entrance. Adjacent to the central portal side there are four dormer windows, first and forth elevated. On the side adjacent to the north dome there are five dormer windows, first and fifth elevated as well.

North and South Dome

North and south dome are three storey high octagons with hipped roofs closed by a smaller octagonal shaped cupola with drum. Each segment of the octagon is five-axis wide and holds a three-axis wide entrance. The front segment is cornered by oriels. Side segments are connected to the main building with single-axis projections. On top of the middle segment a half-circled arch with a clock is located. The cupola is roofed by an octagonal helm-roof with circle-shaped dormer windows.

North Wing

The north wing is roofed by a three-axis long three-storey high hipped roof structure cornered by single-axis octagonal shaped towers.

South Wing

A similar structure attached to the south portal. This elongated structure is angled eight-axis long and three-storeys high. The elongated wing is cornered by a two-axis square shaped tower and a half-circle shaped two-storey structure roofed by an elevated onion-roof.

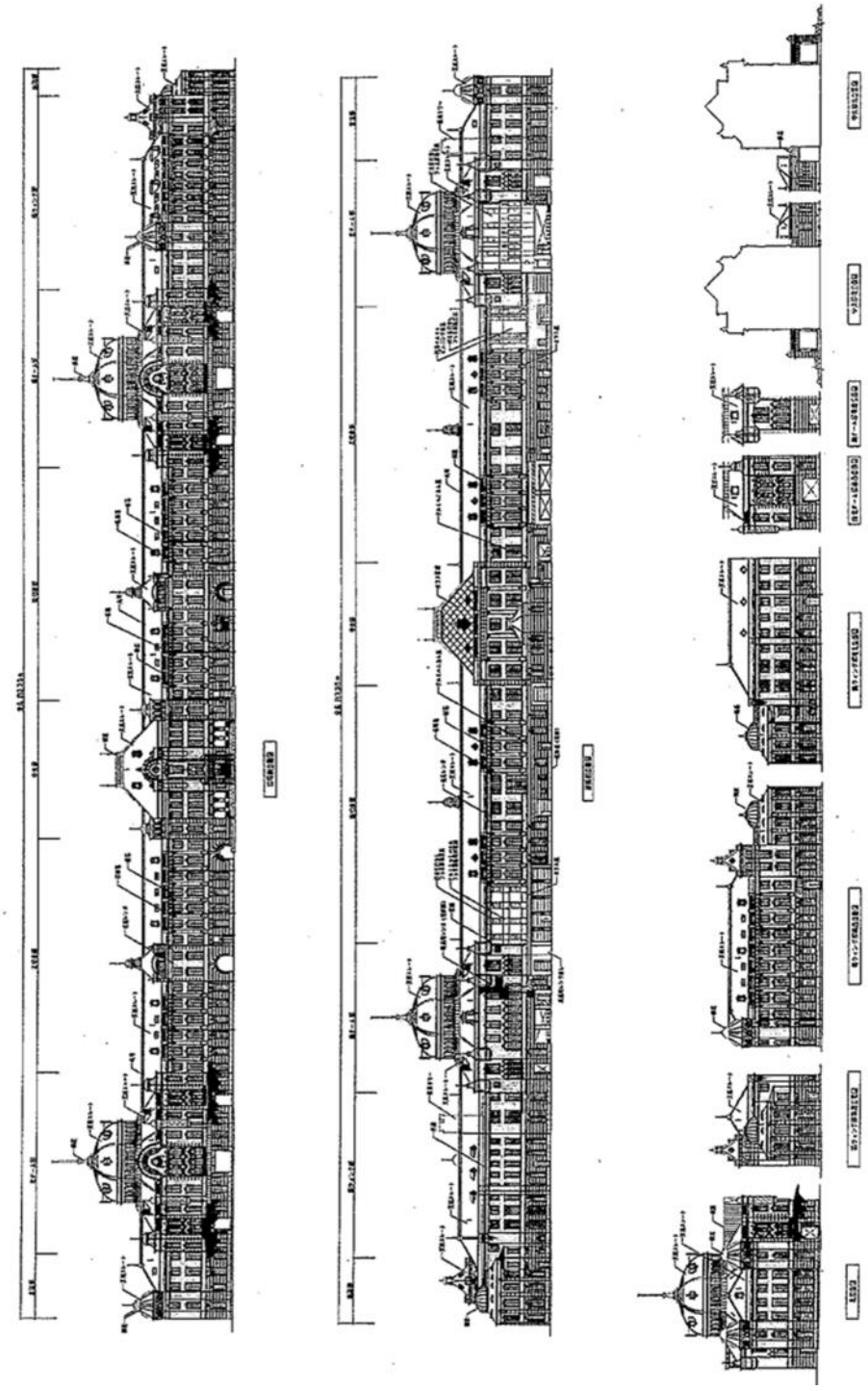


Figure 6.28 View of the Marunouchi building. [237]

[237] Source JR East

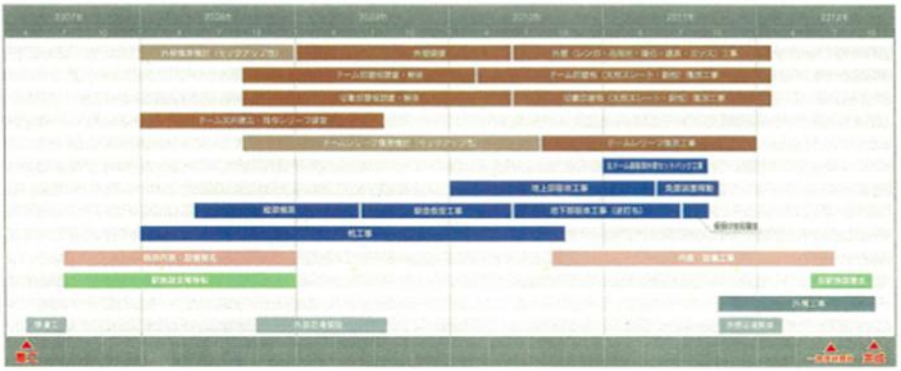


Figure 6.29 Schedule of Marunouchi building construction site. [238]

In Figure 7.31 a rough schedule of of Marunouchi building restoration is shown. The preliminary stage with building site facilities started in April 2007 and is colored grey, green and pink; construction started in January 2008 and ended in December 2011; underground construction is colored blue, above ground construction in brown. Operation started October 2012.

6.7.2 Underground Construction

The two newly designed underground floors made excavation underneath the existing structure removing the wooden pile foundation necessary. The original foundation consisted of 11,000 pine logs. To replace them the executing contractor decided to use a special form of the cut and cover method. With the method applied first slurry walls were installed on each side along the building, next holes were drilled in which concrete piles were set up to the planned upper edge of the foundation plate. For the remaining length of the borehole a steel-beam was used as supporting pillar during excavation. In the next step a reinforced concrete beam placed at ground level was installed (see Figure 7.20). The concrete beams connected with the steel-pillars formed a super structure capable of supporting the building. After construction of the supporting structure excavation could start

[238] Source JR East

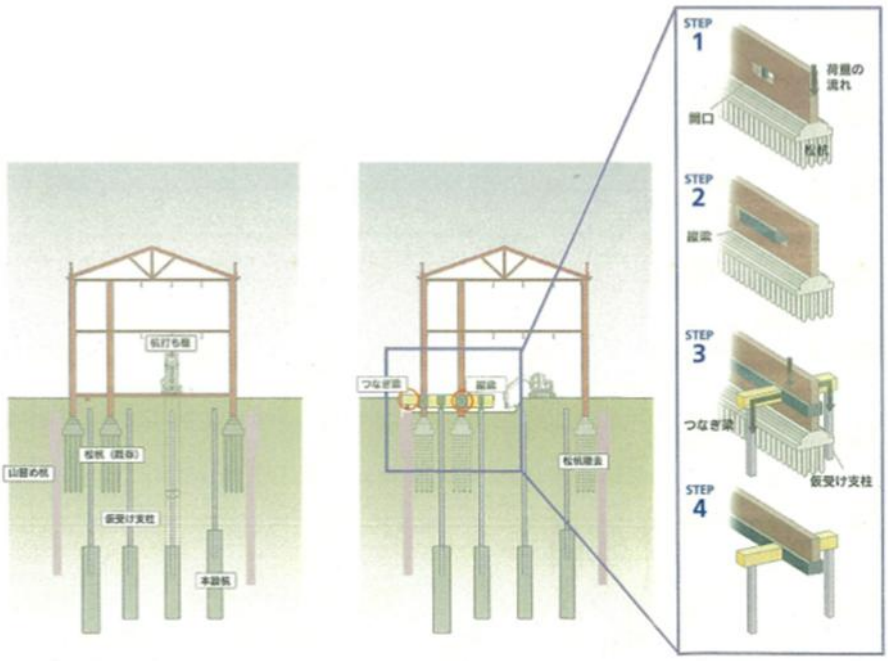


Figure 6.30 Underground excavation – Construction Method. [239]

On the right in Figure 7.32 the installing of reinforced concrete beam is illustrated. First a hole in the reinforced brick wall is opened in which steel spacers are placed. The hole is expanded and filled with reinforced concrete. In this reinforced supporting beam a perpendicular reinforced concrete beam is placed. This reinforced concrete beam matrix is later supported by steel pillars and connection with concrete piles forms the building's foundation.

[239] Source JR East

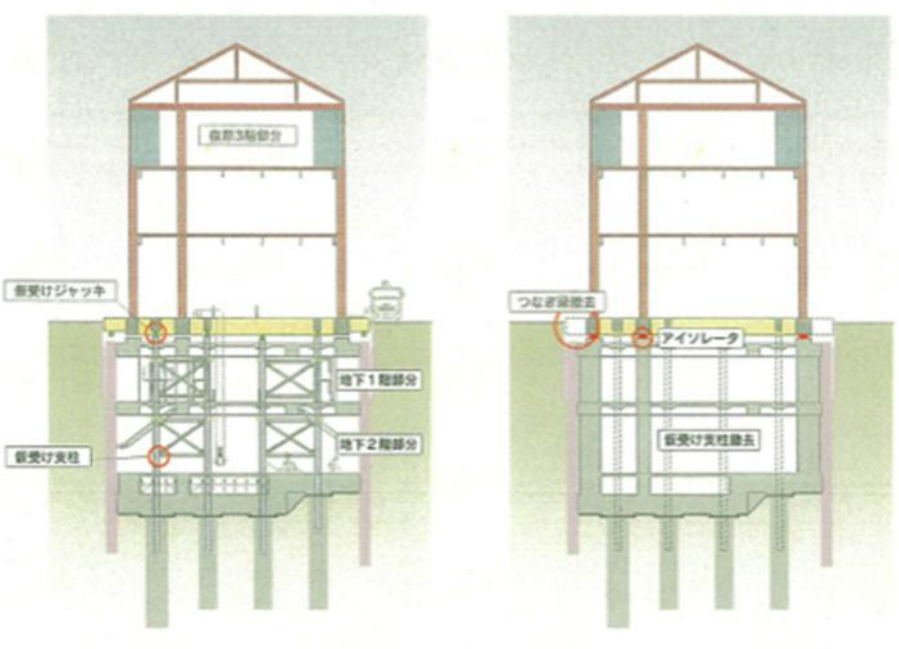


Figure 6.31 Underground excavation – Construction Method. [240]

[240] Source JR East

Figure 6.32 Underground excavation. [241]

6.7.3 Aseismic-retrofitting

The aging structure did not meet modern safety regulations, especially in terms of earthquake resistance. To withstand major earthquakes and to meet modern safety standards restoration work at Marunouchi building included state of the art aseismic-retrofitting. Therefore underground and aboveground sections of the building were separated and an earthquake resistant layer was installed in between (Figure 7.23). Regarding size it is one of the largest aseismic retrofittings in Japan. Also full seismic isolation of the existing structure makes this construction unique.

[241] Source JR East

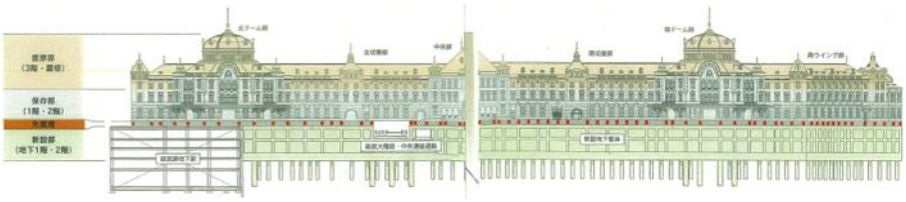


Figure 6.33 Marunuchi building with Underground Section and Earthquake-resistant layer. [242]

The seismic isolation layer consists of 352 seismic rubber isolators and 158 oil dampers. The layer can resist deformation to about 12 cm; maximum design clearance is set to about 20 cm for extremely rare massive earthquakes. Modern technological standard for deformation of large scale structures is about 30 to 50 cm. [243]

Figure 6.34 Location of isolating rubber and oil dampers. [244]

[242] Source JR East

[243] Preservation and Restoration of Tokyo Station Marunouchi Building, Masahiko Nakai, 2013, Page 15

[244] Source JR East

Figure 6.35 Installed Isolating Rubber. [245]

Figure 6.36 Installed Oil Damper. [246]

[245] Source JR East

[246] Source JR East

6.7.4 North and South Dome

Figure 6.37 North Dome modifications. [247]

The original octagonal-shaped domes were approximately 35 m high. Thus the dome was set back from the three-storey structure. The dome was elevated and formed an octagonal sphere. After WWII the three-storey body of the domes were reconstructed in their original shape however the dome was replaced by an octagonal hipped roof two meters lower. JR East restoration plans included reconstruction of North and South dome to its original form designed by Kingo Tatsuno.

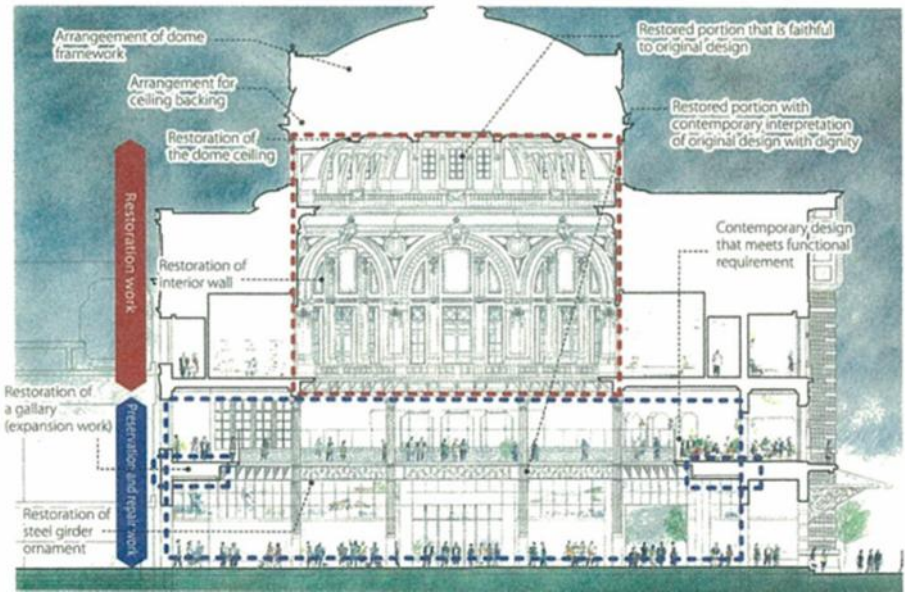


Figure 6.38 Cross section of North Dome. [248]

Originally North dome functioned as entrance hall and South dome as exit hall for passengers. Today both domes again function as concourse in both directions. The domes were divided into two sections with a lower preserved section including the concourse and an upper restoration

[247] Source JR East

[248] Source JR East

section. In the lower section modern standards repair works was carried out and galleries as well as steel girder ornaments were restored. In the upper section existing interior walls, ceiling and dome framework were restored to original shape.

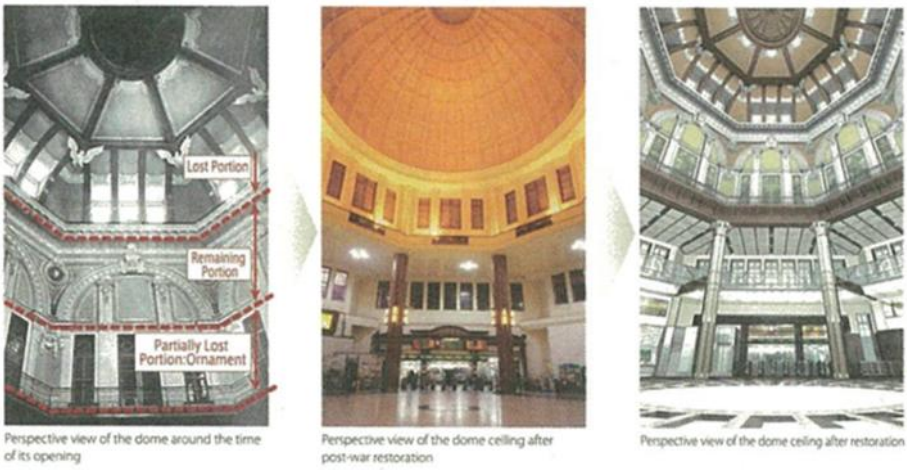


Figure 6.39 Interior of North Dome. [249]

In its original design many traditional Japanese-style motifs were used as ornamental details for the interior of the domes. Blueprints, sketches and comparing photos of the decoration the Committee on Historic Preservation was able to reconstruct the dome's original appearance. Around the central decoration of the dome's ceiling 16 flower reliefs in form of clematis plants were placed, in each of the eight corners an eagle-shaped relief with a wingspan of 2.1 m was mounted and in the eight corners underneath eagle statues with eight of the twelve zodiac signs were discovered. The zodiac signs refer to the different directions, Ox for North-Northeast, tiger for East-Northeast, dragon for East-Southeast, snake for South-Southeast, goat for South-Southwest, monkey for West-Southwest, dog for West-Northwest and boar for North-Northwest. Descriptions on historic documents indicated that egg-yolk yellow plaster had been used for moulding these decorations.

[249] Source JR East

Figure 6.40 Ornamental Details in the Domes – restored (above) and original (underneath). [250]

Due to severe damage caused by fire remaining original reliefs were often too brittle to preserve and had to be replaced. Reliefs which could be saved were treated with chemical agents.

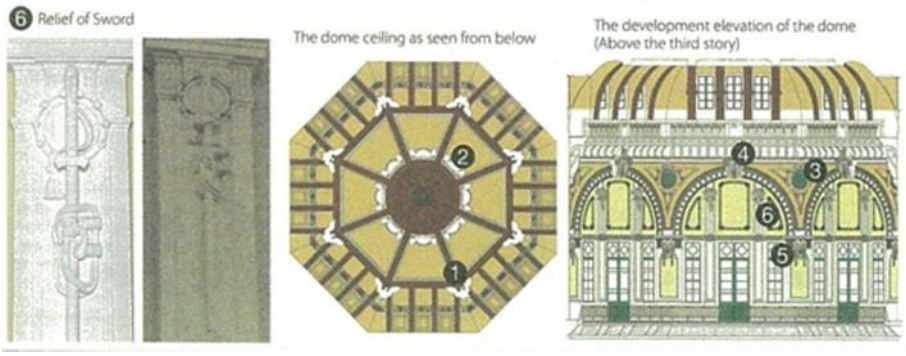


Figure 6.41 Ornamental Details in the Domes. [251]

Figure 7.32 describes the position of different ornaments in the interior of North- and South-Dome.

(1) Eagle sculpture

(2) Flower ornament

(3) Zodiac animal relief

(4) Helmet-shaped keystone

(5) Phoenix relief

(6) Sword relief

[250] Source JR East

[251] Source JR East

6.7.5 Façade

The original external reinforced brick walls consist of structural bricks overlaid with two types of decorative bricks, 15 mm and 45 mm thick. After damage during WW II walls stayed in their basic structure, however the upper storey was demolished and the façade was reconstructed according to lower building height. Restoration included restoring the original three-storey structure of the Marunouchi building. Thereby the decorative columns were expanded, the existing capitals relocated to the third floor and shape restored to a three floor curvature. Artificial stone moulding granite powder was widely used for shaping the columns, only decorative elements on third floor windows were made of granite.

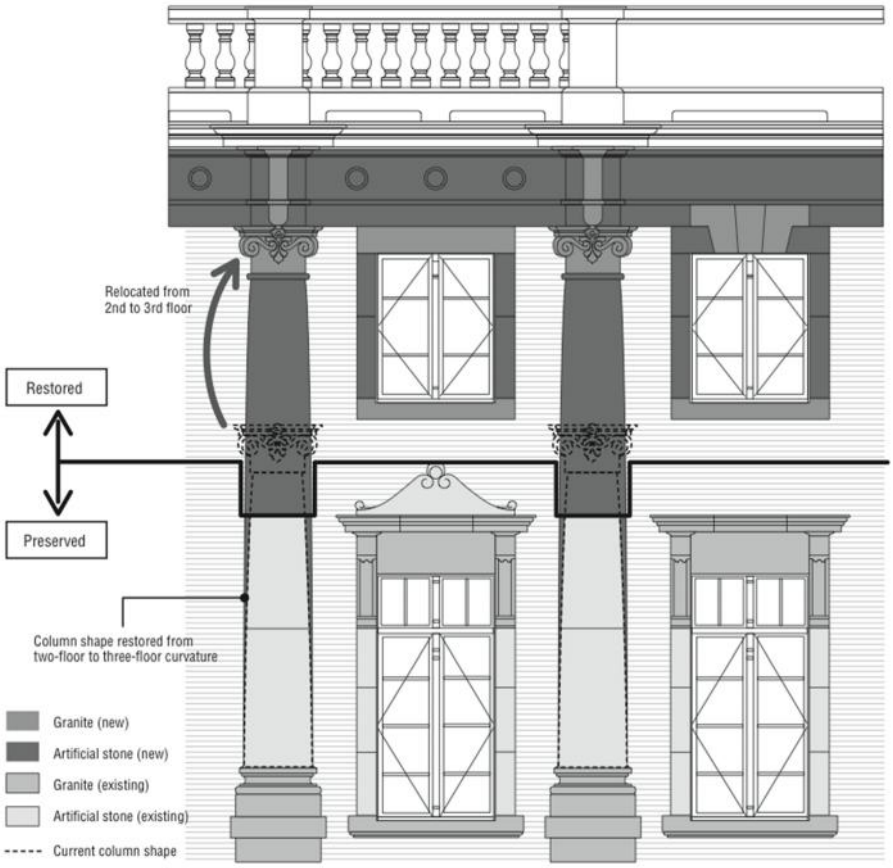


Figure 6.42 Restoration of the Facade. [252]

To create a harmonic transition between preserved lower section and restored upper section the same optical and haptic qualities of the original decorative bricks had to be reproduced. Therefore different mixtures were tested for kilning. The walls of the newly built third floor

[252] Preservation and Restoration of Tokyo Station Marunouchi Building, Masahiko Nakai, 2013, Page 9

consist of reinforced concrete covered by 15 mm thick decorative bricks. In total over 400,000 decorative bricks were used to restore third floor walls.

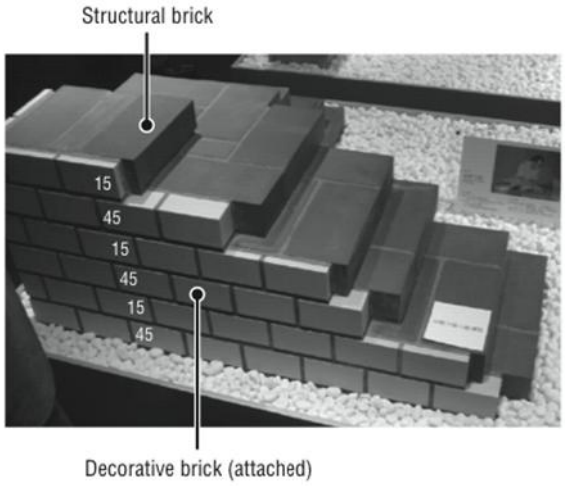


Figure 6.43 Use of structural and decorative bricks. [253]

6.7.6 Roof

The roof-structure of reconstructed Marunouchi station was elevated from 19 m gable height to 23 m. The wooden structure was replaced by a steel frame. The octagonal hipped roofs of North and South domes were replaced by an octagonal round shaped wooden structure with round shaped skylights in each section, as well as octagonal towers at both ends and spirelets in the corners. The skylights, tower tops, ridges, eaves and decorative elements on dome roofs are copper sheathed.

[253] Preservation and Restoration of Tokyo Station Marunouchi Building, Masahiko Nakai, 2013, Page 8

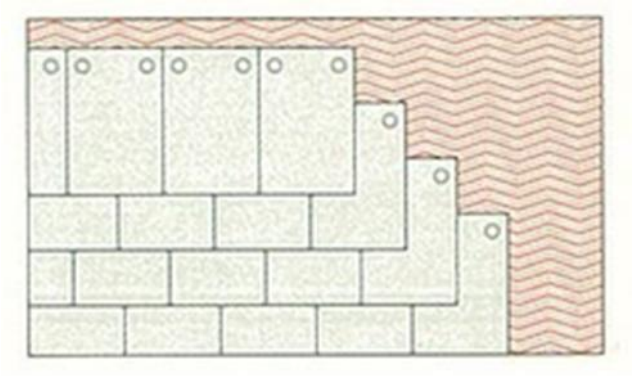


Figure 6.44 Pattern of roof covering. [254]

The original roof covering consisted of pure-black slates laid in the Ichimonji buki style, which is a three-layer style with double nailing. This method was applied with natural slates. So slates undamaged by March 11th tsunami were laid in prominent areas, especially for dome roof covering.

Figure 6.45 Nailing slates. [255]

[254] Source JR East

[255] Source JR East

7 Real Estate Market

In the late 1980s Japanese real estate market underwent a speculative bubble, the Japanese asset price bubble (JAPB), which collapsed in 1991 and caused so called “Lost Two Decades”, a period of negative growth and price stagnation. At its peak land prices reached more than five times the value as on end of March 2000 (see Figure 7.1). Prices once more increased in 2006 until the so called Great Recession triggered by the financial crisis in 2008. The overall trend shows an average price level of approximately 80 %[256] compared to end of March 2000.

Figure 7.1 Long-Term Trend of Japanese Land Prices. [257]

Furthermore decline population, exorbitant fiscal deficit and stagnating economy result in poor market conditions. Nevertheless Japan with a total value of approximately $ 2.678 billion[258] respectively 10.1 %[259] of worldwide Institutional-Grade Real Estate has the second largest Real Estate Investment Market in the world. Despite this poor market condition low prices still attract international investors, especially from China, and Japanese law encourages real estate investment. Moreover, Tokyo as an international finance center with numerous worldwide operating companies is an attractive target of investment in the real estate sector.

[256] Japanese Real Estate Investment Market 2013, Nomura Research Institute, Page 23

[257] Japanese Real Estate Investment Market 2013, Nomura Research Institute, Page 23

[258] Japanese Real Estate Investment Market 2013, Nomura Research Institute, Page 18

[259] Japanese Real Estate Investment Market 2013, Nomura Research Institute, Page 18

7.1 Securitized Real Estate Assets

In 1994 the enactment of Real Estate Syndication Act, the Law on Securitization of Specified Assets by Special Purpose Companies in 1998 and the revision of Investment Trust and Investment Corporation Law in 2000 made it possible to launch Japanese Real Estate Investment Trusts (J-REITs). In Japan two types of REIT exist, the company type in which investment corporations manage capital from investors by a management company, and the trust type in which a trust bank manages capital from investors by itself. While offices accounted for the biggest sector of Securitized Assets in recent years a trend towards mixed structures could be observed. In 2011 offices accounted for 24.3 %[260], the lowest level since records began. Today there are 37 J-REITs listed with total acquired securitized assets of a total value of approximately ¥ 51 trillion[261].

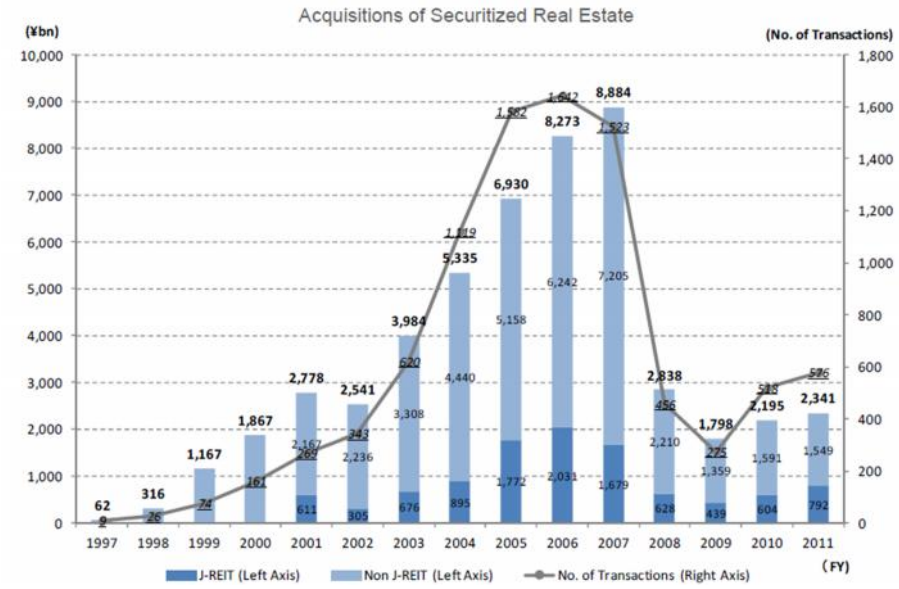


Figure 7.2 Acquisition of Securitized Real Estate[262].

Tokyo and its suburbs, GTA, account for approximately 70 %[263] of Japan's securitized properties in 2011 and represents by far the biggest market. Securitized transactions amounted to 576[264] transactions with a

[260] Real Estate in Japan 2013, Real Estate Companies Association of Japan, Page 33

[261] Japanese Real Estate Investment Market 2013, Nomura Research Institute, Page 20

[262] Japanese Real Estate Investment Market 2013, Nomura Research Institute, Page 19

[263] Japanese Real Estate Investment Market 2013, Nomura Research Institute, Page 22

[264] Japanese Real Estate Investment Market 2013, Nomura Research Institute, Page 19

total amount of ¥ 2,341 billion[265] in 2011 after its peak of 1,523[266] transactions with a total amount of ¥ 8,884[267] billion in 2007.

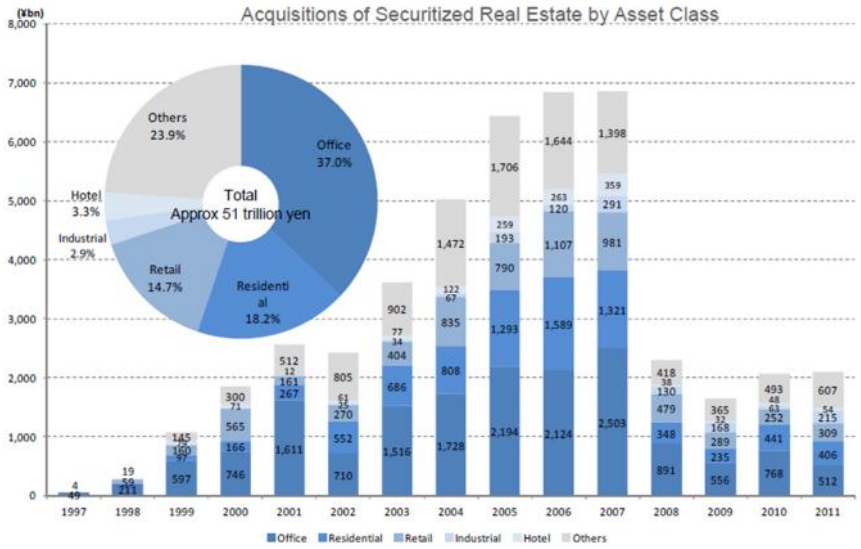


Figure 7.3 Acquisition of Securitized Real Estate by Asset Class. [268]

7.2 Real Estate in Tokyo

Tokyo and GTA with a population of 36.9 million[269] is the world's most populous metropolitan area and with a total GDP of approximately $ 1,875 billion[270] it also boasts the largest metropolitan economy in the world and it is still growing. This trend is considered to continue, making Tokyo an attractive real estate investment market. In 2012 Tokyo real estate market accounted for an transaction volume of more than $ 22.2 billion[271] representing a 5 %[272] increase to 2011, ranking Tokyo fourth in a global market.

[265] Japanese Real Estate Investment Market 2013, Nomura Research Institute, Page 19

[266] Japanese Real Estate Investment Market 2013, Nomura Research Institute, Page 19

[267] Japanese Real Estate Investment Market 2013, Nomura Research Institute, Page 19

[268] Japanese Real Estate Investment Market 2013, Nomura Research Institute, Page 20

[269] Statistical Handbook of Japan, 2013, Page 23, Table 2.10

[270] http://www.foreignpolicy.com/articles/2012/08/13/the_most_dynamic_cities_of_2025, on 10.09.2014

[271] Japan Real Estate First Quarter 2013, RREEF, Page 7

[272] Japan Real Estate First Quarter 2013, RREEF, Page 7

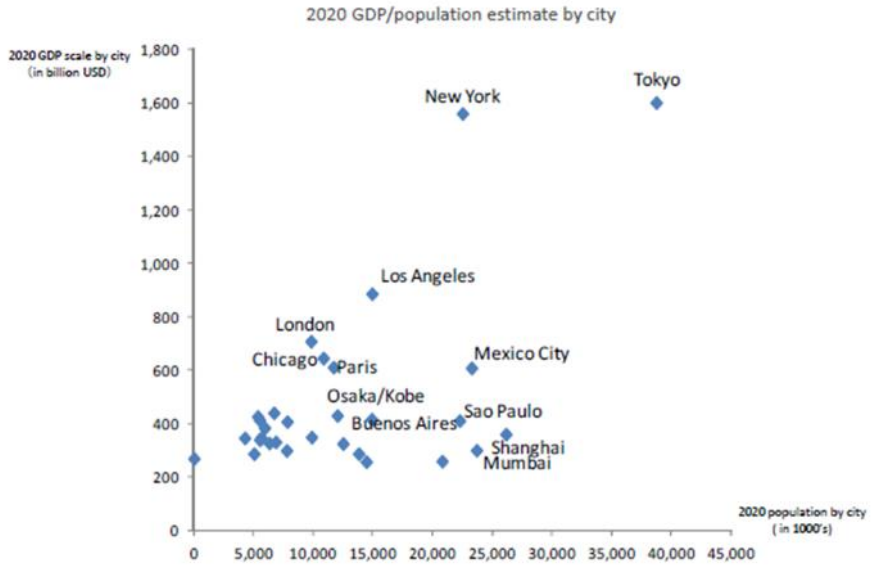


Figure 7.4 GDP with reference to population ratio in 2020 by City. [273]

Moreover since 1995 GTA saw a steady population inflow, making it the fastest growing area in Japan. However since 1980s Japan's population increased annually by less than 1 % and shrinking since 2011. Moreover in 2012 more than 24 %[274] of Japan's population were older than 65, a trend which is about to continue. It is estimated that by the year 2060 Japan's total population will be about 86.7 million people, meaning a decrease of 41.3 million[275] compared to 2010. Compared to 2010 Tokyo area population it is predicted to shrink by approximately 9.3 % until 2040[276].

[273] Japanese Real Estate Investment Market 2013, Nomura Research Institute, Page 14

[274] Statistical Handbook of Japan, Page 12

[275] White Paper on Land, Infrastructure, Transport and Tourism in Japan, Page 3

[276] White Paper on Land, Infrastructure, Transport and Tourism in Japan, Page 4

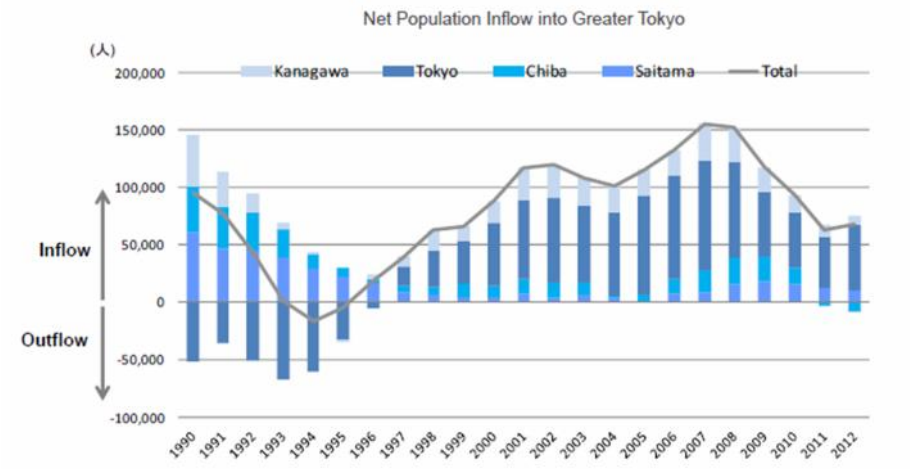


Figure 7.5 Net Population Inflow to GTA. [277]

7.2.1 Land Price Development

Since the “bubble economy” in 1991 land prices in GTA have sharply decreased but around 2000 prices stabilized around 93.6 % compared to 1983, resulting in a less volatile and more market-friendly environment. Average market value of standard sites within the five central wards was about 4,455,350 ¥/m² in 2014[278].

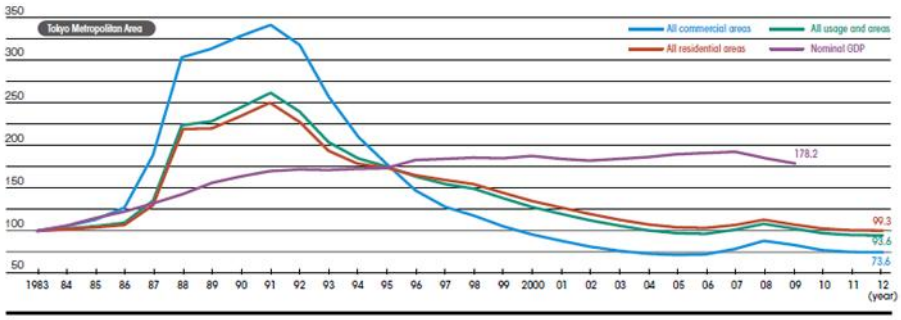


Figure 7.6 Land Price Development in Tokyo. [279]

[277] Japanese Real Estate Investment Market 2013, Nomura Research Institute, Page 15

[278] http://tochi.mlit.go.jp/english/secondpage/7463, 20.09.2014

[279] Real Estate in Japan 2013, Real Estate Companies Association of Japan, Page 54

7.2.2 Age composition of existing structures

In 2010 29.1 %[280] of all office buildings in major business districts in Tokyo were older than 30 years. Newly built structures accounted for a total floor area of 2.8 [281] million m², while demolished structures accounted for 1.4[282] million m² representing an increase of approximately 2.8 %[283]. Nihonbashi-Yaesu-Kyobashi, with 59.8 %[284] of all structures older than 30 years in 2010 Otemachi-Marunouchi-Yurakucho, with 46.6 %[285] older than 30 years in 2010 are the business districts with the oldest structures.

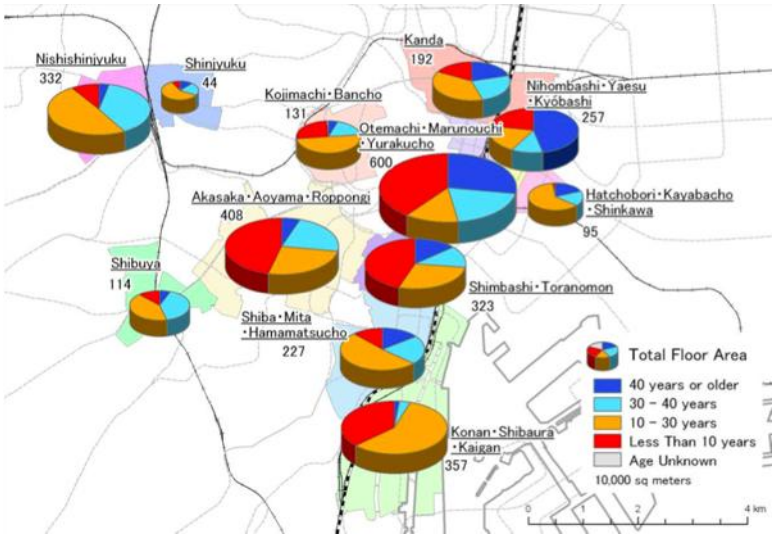


Figure 7.7 Age Composition of existing structures in major office areas in Tokyo. [286]

7.2.3 Vacancy rates

In recent years several large scale projects were completed, this led to an increase of the overall vacancy rate. Especially in 2012 a vast amount of new offices entered the market. Vacancy rates for new building increased by 39.2 % [287] in May 2012 but declined to 29.9 % [288] in

[280] The Annual Japanese Office Buildings Survey, 2010, Page 10

[281] The Annual Japanese Office Buildings Survey, 2010, Page 10

[282] The Annual Japanese Office Buildings Survey, 2010, Page 10

[283] The Annual Japanese Office Buildings Survey, 2010, Page 10

[284] The Annual Japanese Office Buildings Survey, 2010, Page 10

[285] The Annual Japanese Office Buildings Survey, 2010, Page 10

[286] The Annual Japanese Office Buildings Survey, 2010, Page 10

[287] Japan Real Estate First Quarter 2013, RREEF, Page 11

[288] Japan Real Estate First Quarter 2013, RREEF, Page 11

December 2012. For all office buildings in the five central wards an average vacancy rate of 8.7 %[289] in December 2012 was observed.

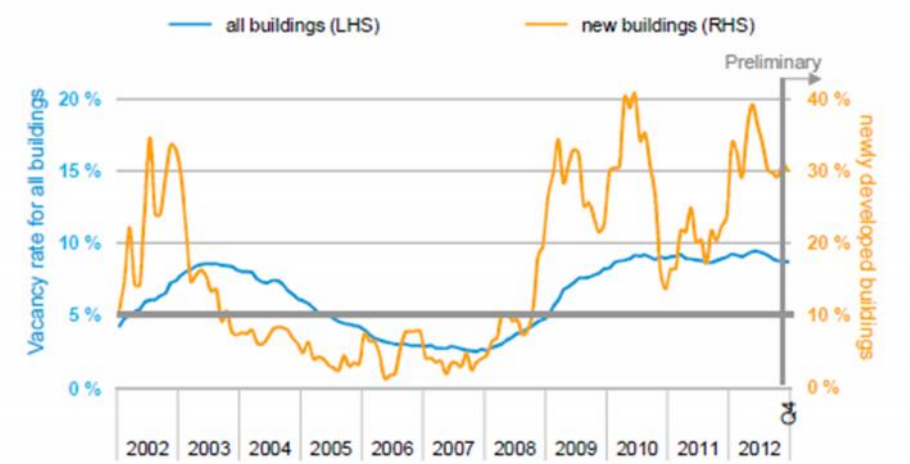


Figure 7.8 Office vacancy rates in five central wards of Tokyo. [290]

A Relatively low vacancy rate of 6.6 %[291] for larger compounds, with a floor size of more than 660 m², was assessed. Assets with a relatively small floor size, between 165 m² and 330 m² had a vacancy rate of 11.9 %[292].

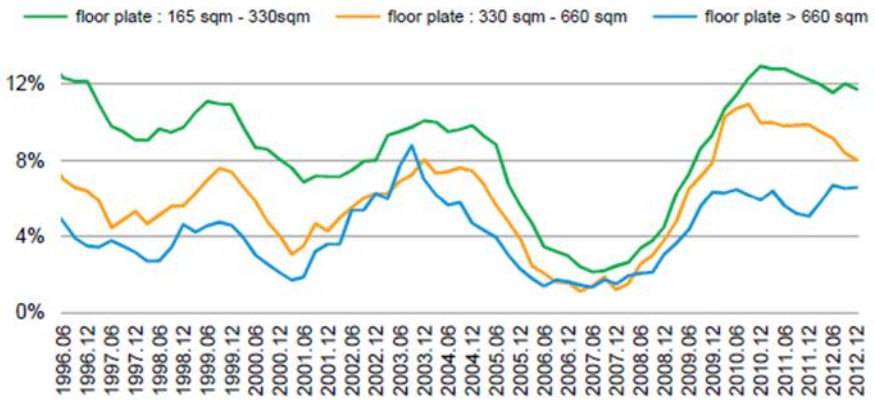


Figure 7.9 Office vacancy rate in Central Tokyo by Building Floor Size. [293]

[289] Japan Real Estate First Quarter 2013, RREEF, Page 11

[290] Japan Real Estate First Quarter 2013, RREEF, Page 11

[291] Japan Real Estate First Quarter 2013, RREEF, Page 12

[292] Japan Real Estate First Quarter 2013, RREEF, Page 12

[293] Japan Real Estate First Quarter 2013, RREEF, Page 12

7.2.4 Rental rates

Tokyo with its five central wards is ranked fifth[294] in the world regarding rental rates for office space. Average rents in five central wards of Tokyo slightly decreased. Thereby Chuo-Ku with a decrease of 2.78 %[295] to ¥ 15,640 per Tsubo[296] (equal to 4731.1 ¥/m²) suffered the largest drop.

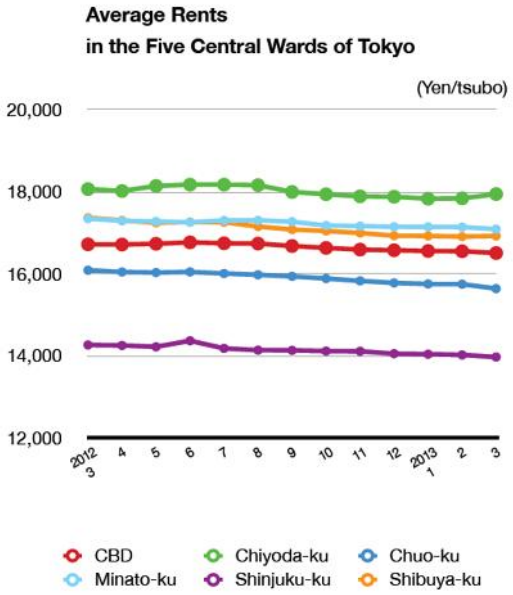


Figure 7.10 Average office rental rate in the five central wards of Tokyo. [297]

Average rent of existing office space in Tokyo CBD at the end of March 2013 was ¥ 16,302[298] per Tsubo (equal to 4,931.4 ¥/m²) respectively a down of 1.64 %[299] compared to March 2012. The average rent for office space in new office blocks at the end of March 2013 was ¥ 25,291[300] per Tsubo (equal to 7,650.5 ¥/m²) respectively an up of 12.29 [301] % compared to March 2012, making the rental rate in new buildings 1.55 times more expensive.

[294] Office Space across the World, Cushman & Wakefield Research Publication, 2013, Page 9

[295] MIKI Tokyo Office Market Research Report, 2013, Page 3

[296] MIKI Tokyo Office Market Research Report, 2013, Page 3

[297] MIKI Tokyo Office Market Research Report, 2013, Page 3

[298] MIKI Tokyo Office Market Research Report, 2013, Page 3

[299] MIKI Tokyo Office Market Research Report, 2013, Page 3

[300] MIKI Tokyo Office Market Research Report, 2013, Page 3

[301] MIKI Tokyo Office Market Research Report, 2013, Page 3

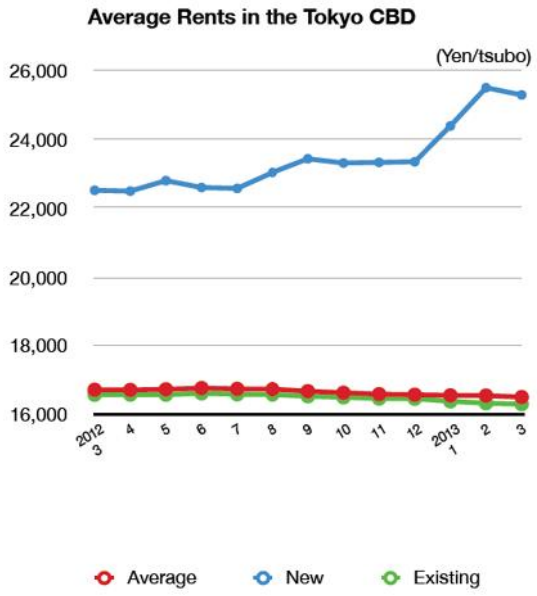


Figure 7.11 Rental Rates for 1st floor retail assets. [302]

7.2.5 Return Rate

After a period of negative return rate capital return reversed trends. Average annual total return for direct real estate investment increased from 3.6 %[303] in September 2011 to 3.9 %[304] in September 2012. Thus Residential real estate is the sector with the highest return rate. Although capital growth entered a period of negative return, income return remained stable at approximately 5 %[305].

[302] MIKI Tokyo Office Market Research Report, 2013, Page 3

[303] Japan Real Estate First Quarter 2013, RREEF, Page 8

[304] Japan Real Estate First Quarter 2013, RREEF, Page 8

[305] Japan Real Estate First Quarter 2013, RREEF, Page 8

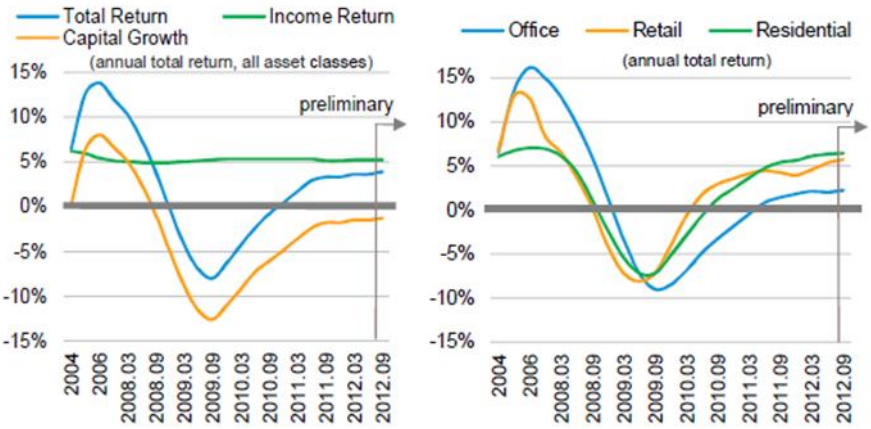


Figure 7.12 Return rates for real estate investment in Japan. [306]

7.3 Development around Tokyo Station

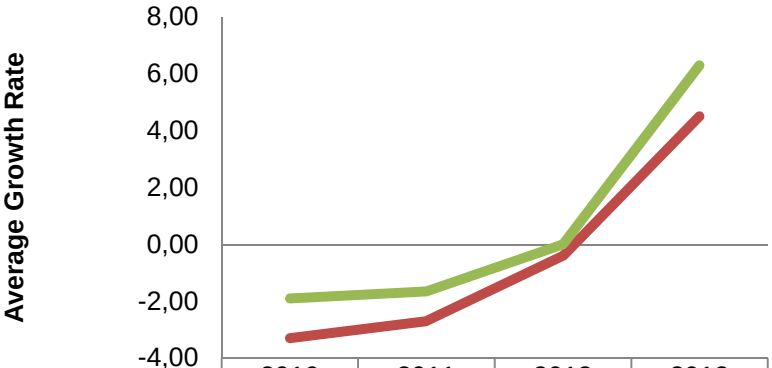
In recent years several large-scale projects were completed or will be built around Tokyo Station. Being among the oldest business districts of Tokyo with a relatively high percentage of structures older than 30 years the Otemachi-Marunouchi-Yurakucho district was recently focused on by private investors. One reason was effective cooperation of landowners, private investors and government, which also made the redevelopment of Tokyo Station possible stimulating rapid development. Starting 2000 22 projects have been completed with a total floor area of approximately 2.86 million[307] m².

[306] Japan Real Estate First Quarter 2013, RREEF, Page 8

[307] Otemachi Marunouchi Yurakucho District Redevelopment Project Council, 2008, Page 6 f.

Figure 7.13 Current projects in Otemachi-Marunouchi-Yurakucho [308]

After a period of decreasing prices land prices increased and trends reversed. In 2013 land prices of available lots in Chuo increased by 4.5 %, in Marunouchi even by 6.3 %.



	2010	2011	2012	2013
Chiyoda-ku	-3,30	-2,70	-0,40	4,50
Marunouchi	-1,90	-1,65	0,00	6,30

Figure 7.14 Development of prices of available land. [309]

[308] Otemachi Marunouchi Yurakucho District Redevelopment Project Council, 2008, Page 6 f.

[309] Own Figure, Data Source: MLIT

Hypothetical value of unavailable lots in Marunouchi increased rapidly between 2006 and 2009 by 52 %, declined and stabilized 22 % higher regarding 2006 prices.

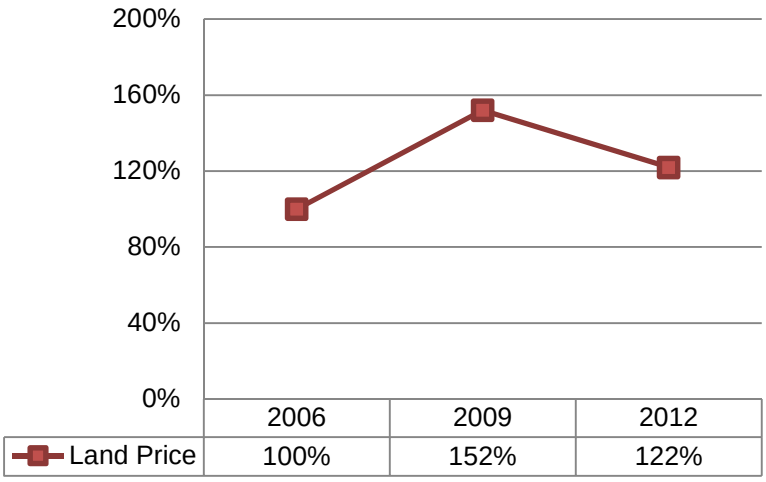


Figure 7.15 Hypothetical value of unavailable land in Marunouchi. [310]

7.4 Tokyo Station

JR East including completed Tokyo Station City reported an average vacancy rate of approximately 2 %, among the lowest nationwide. Also rental rates of the Sapia Tower with 40,000 to 45,000 ¥ per Tsubo (equal to 13,176 ¥/m² to 14,823 ¥/m²) and North and South-Tower with 45,000 to 50,000 ¥ per Tsubo[311] (equal to 14,823 ¥/m² to 16,470 ¥/m²) are among highest in Japan. Low vacancy rates accompanying relatively high rates result from outstanding design, prestigious location and combining modern design and tradition.

Building	Monthly Rental Rate (¥/m²)
Sapia Tower	40,000 – 45,000
South Tower	45,000 – 50,000
North Tower	45,000 – 50,000

[310] Own Figure, Data Source: MLIT

[311] http://officee.jp/en/catalog/Gran+Tokyo+North+Tower/44937/, on 11.09.2014

8 Conclusion

Impacts and influence on a nation's cultural identity are reflected by its cultural heritage. Buildings of different epochs represent remarkable footprints of each era. It is essential that these monuments of the past are preserved and utilized for modern day use, but preservation should not only be applied to historical landmark buildings. Moreover, utilization of existing architectural substance and outdated structures can stimulate the market and prevent excessive supply, as well as send signals for sustainable use of building assets. Functional use of such structures is essential to guarantee permanent preservation.

The cultural landscape of Japan, especially of the Meiji era and its progress to a modern nation, for a long time was underestimated, ignored and torn down. Only around 2000 a reversal of trends could be observed and Japan began to develop a different perspective towards the urban structures of this particular period. Most of the architectural heritage of the Meiji period is irretrievably lost but nevertheless this change of attitude lead Japan towards an innovative discussion of building in existing environments. In modern day Japan it is still fashionable to demolish existing structures and replacing them by new ones. Modernization of buildings is rather exceptional. One reason is Japan's constant threat of earthquakes, making preservation a rather difficult task. Nevertheless earthquake resistant technology rapidly improved in past decades making aseismic retrofitting for existing structures practicable. Additionally most of the existing structures proved sufficient earthquake resistance guaranteeing safe preservation. Another reason is that preservation long time exclusively was applied to religious monuments and edifices of extraordinary cultural value. However, in recent years an increasing public awareness towards architectural heritage increased and a growing number of initiatives to preserve or restore existing structures could be observed. Citizens more and more identify with landmark buildings and urban landscapes expressing desire to augment worthiness of the neighbourhood.

There are numerous reasons for the Japanese to support building in existing environment, some are listed below:

- Declining demand caused by a shrinking population
- Stagnating real estate prices
- New markets for decreasing declining industry
- Redeveloping dilapidating districts
- Retrofitting and modernizing dated structures
- Raising recognition value of buildings, districts, etc.

- Increasing public identification with monuments, historic buildings, districts, etc.

Land prices declined rapidly after burst of the asset price bubble and stagnated on a rather low level in comparison to other major cities. Since then the Japanese real estate market was unable to achieve a constant increase of land prices with no reversal of trend in sight. Japan's declining population and its demographic dilemma of an aging society will inevitably lead towards a decline in demand of built-up space, causing reduced prices in the real estate sector. Furthermore a well-protected home market and a more aggressive long-term foreign policy context will create a negative mood with international investors resulting in less competitive business environment. Presently the "Abenomics" succeed in creating an investment-friendly environment and increasing demand in the office sector, still able to attract foreign investors. However, stimulation programs will only sustain such conditions for a short period and most of foreign investors intend to remain less than ten years in the market. In the long run Japan will have to reduce real estate capacity and building in an existing environments will become more and more important, a trend similarly encountered in some regions and cities in Europe. To avoid future decrease of prices in Japan and in particular in Tokyo assets should be improved to increase their value.

The Japanese government, especially under Prime Minister Koizumi, passed several laws to liberate the real estate market and stimulate development. Particularly the Floor Area Ratio Bonus systems had a positive impact. Regulations established however focus on new projects and less on modernizing or preserving existing structures. In recent years Tokyo Metropolitan Government began to optimize these development tools by setting target areas. For the near future Tokyo assigned a program to support green and environmental friendly design. It was also essential that Tokyo took effective measures to support modernization and preservation of existing structures. This would improve existing substance and urban landscape, and prevent excessive supply. But it will be necessary to cooperate with construction industry in an early stage to provide adequate technology in order to preserve and utilize outdated structures based on a concept of sustainable use. Building in an existing environment still is considered a niche market in Japan, however it has evolved into a major sector in the European construction industry. It may become a future market opportunity for weakened Japanese construction industry with possibilities entering a new business field in neighbouring countries.

In order to support utilization of existing building substance the Japanese government should take several measures:

- Provide supportve legal framework
- Promote preservation and modernization projects

- Establish competent scientific environment to develop adequate technology
- Inaugurate special programs for preservation experts
- Cooperation with international experts

Being among a growing number of preservation projects Tokyo Station City Project represents an extraordinary example merging a historic structure with modern office block. Utilizing Marunouchi station building as central hub embedded in a high rise tower complex, creating a landmark in the heart of Tokyo the project affects the character and stimulates redevelopment of the surrounding area. Furthermore the project indicates capabilities of modern day earthquake-resistant technology as well as the result of excellent cooperation between all stakeholders. Although being exceptional the project effectively demonstrates the advantages of partial modernization of existing structures.

Such landmark buildings definitely accelerate redevelopment of an entire district, however, it is essential to develop sustainable utilization of existing structures on a larger scale. Therefore it is essential to document completed and ongoing projects with regard to existing substance to set up a database, allowing Japanese authorities to take efficient measures to support building in existing environments.

Future research activities are to encourage a more precise definition of measures to be taken by the Japanese government in order to promote modernization of outdated building substance. Therefore studies regarding long term development of Japanese real estate market would be necessary. Another interesting field would be aseismic retrofitting and adaptable environmental friendly technology for existing structures including cost-benefit analysis. Also research about public awareness of and individual identification with architectural heritage of Japanese society and ways to increase it must be intensified. Furthermore life-cycle costs of projects including preservation should be assessed to point out advantages and economic feasibility of permanent utilization and preservation.

Appendix

A.1. Description of historic buildings in chapter 1.2

Federal Building - Chicago

Figure 1 Federal Building before[312] and after[313] 1965

The first Federal Building was completed in 1905. American architect Henry Ives Cobb designed it in the Beaux-Arts style. This French-origin style influenced American architecture in the end of 19th century and the beginning of 20th century. The rotunda with a diameter of 30 meter was larger than the one of the Capitol in Washington D.C. It was torn down in 1965 and replaced by a modernist skyscraper designed by famous Mies van der Rohe.

Elbe Philharmonic Hall - Hamburg

[312] http://www.fjc.gov/history/courthouses.nsf/lookup/IL-Chicago_1905_Ref.jpg/$file/IL-Chicago_1905_Ref.jpg

[313] http://www.gsa.gov/portal/content/101886

Figure 2 Elbe Philharmonic Hall © Herzog & de Meuron[314]

In 1875 a landmark warehouse, the “Kaiserspeicher”, was constructed at the waterfront of Hamburg’s harbor-city. Through damage taken during WW II the building was demolished and a new Warehouse was constructed. However because of the rise of container transport it became obsolete. Several plans to utilize the facility regarding its remarkable location, seize and adaptable design have been made. In 2003 Herzog & de Meuron suggested a Philharmonic Hall on top of the Warehouse. Construction started in 2007 and completion is expected in 2015.

Fort Macquarie Tram Depot - Sydney

[314] https://www.elbphilharmonie.de/elbphilharmonie-hamburg.en

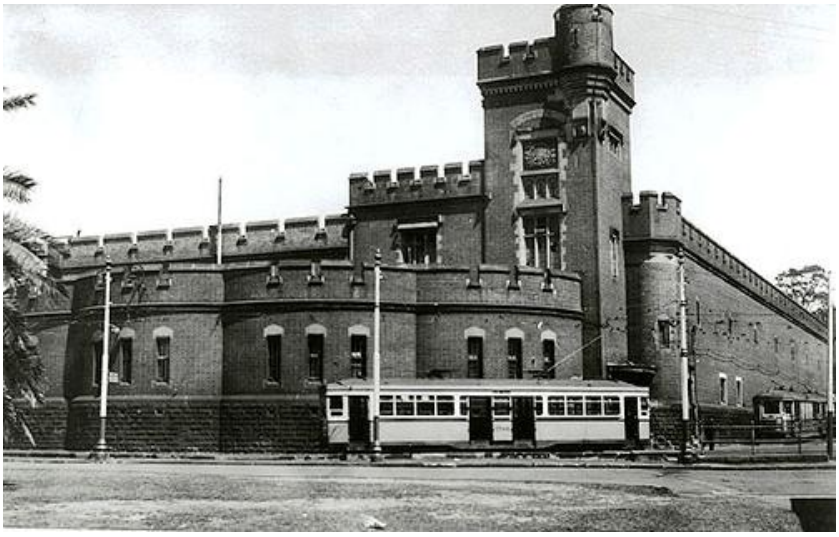


Figure 3 Fort Macquarie Tram Depots in the 1940's[315]

It was built on Bennelong Point in Sydney Harbor on the former grounds of Fort Macquarie in 1901. In homage honor to its predecessor it was designed as a brick fortress. In 1955 most of the Tram service was transferred to Dowling Street Depot and it was demolished in 1958 to make way for the Sydney Opera House.

Galleria Vittorio Emanuele II - Milan

Figure 4 Galleria Vittorio Emanuele II[316]

[315] https://www.flickr.com/photos/26685137@N03/sets/72157616080287888/

[316] http://www.aviewoncities.com/milan/galleriavittorioemanueleii.htm

Due to a competition for the redevelopment in the inner city of Milan in 1860 architect Giuseppe Mengoni proposed to construct a glass covered shopping arcade. The arcade is named after Vittorio Emanuele II, king of the newly created kingdom of Italy. The Galleria symbolizes the unification and the self-confidence of the new kingdom. It became one of Milan's most popular spots and was renovated several times since its completion in 1877.

Himeji Castle - Himeji

Figure 5 Himeji Castle[317]

Himeji Castle is considered as the finest example of Japanese castle architecture in its original form. It became world heritage in 1993. Initially Himeji castle was built to by the end of 16th century by Toyotomi Hideyoshi in order to protect important communication routes. This castle was later on destroyed and replaced by a large fortress, which was extended over the centuries. After the Meiji restoration in 1868 it was preserved due to the intervention of several army officers. In 1945 the surrounding military facilities were demolished but the inner buildings and the castle itself remained.

Hongokan - Tokyo

[317] http://whc.unesco.org/en/list/661/

Figure 6 Hongokan[318]

In 1905 an aristocratic family from Gifu prefecture built the Hongokan as a dormitory for the Ochanomizu Women's College. Later it became a luxurious lodge. It was designed as a 3-story wooden construction in a L-shaped form with more than 1,500 sqm. This made it Japans oldest 3-story wooden lodging house. The owner announced reconstruction in 2006. Despite public support to preserve the building, it was torn down in 2011 and replaced by a modern apartment house.

Imperial Hotel - Tokyo

Figure 7 Imperial Hotel #2, #3[319]

Because of its modernization with the help of western experts and its overseas trade Japan needed an appropriate accommodation for foreign visitors. In 1887 21 investors gathered to announce the construction of the Imperial Hotel, among them was the Imperial Household Ministry. In 1890 it opened its doors, it soon reached its capacity. In 1922 it burned down and Frank Lloyd Wright was appointed to plan a new hotel, which

[318] http://japanpropertycentral.com/2011/07/historic-lodging-house-hongokan-to-be-demolished-in-august/

[319] http://architectstudio3d.org/AS3d/about_imperial.html

was completed in 1923. In the late 1960's a discussion took place to either preserve or replace the structure, which was damaged through the 1923 earthquake and air raids in WW II. The decision to replace by a high-rise building was made and in 1967 it was demolished. The central lobby was transferred to the Meiji-mura museum.

Japan Central Post Office - Tokyo

Figure 8 Japan Central Post Office[320]

Japan Post redeveloped its estate in Marunouchi Tokyo in 2007. The redevelopment plan included a 38-story high-rise tower. The former structure was completed in 1931 and was considered as an important example of modern architecture in Japan. This and public movement suggesting preserving the building led to a design, which includes parts of the former structure. Finally the 5-story exterior walls were preserved.

Louvre - Paris

[320] http://www.japantimes.co.jp/news/2012/07/18/business/post-office-reopens-in-historic-tokyo-building/#.U0Tqz9x_fwI

Figure 9 Louvre[321]

First structure that was built on the grounds of the Louvre was an arsenal in 1190. It was later extended but due to the expanding of the city it lost its defense function. In 1364 under the commission of Charles V it was redeveloped as a royal residence. Over the centuries it was extended and refurbished. In 1672 Louis XIV moved to Versailles and uses it as permanent residence. The Louvre was abandoned for 20 years. Finally in 1692 Louis XIV ordered to establish a gallery of antique sculptures in the Louvre. This was the beginning of its use as a museum. In 1981 redevelopment project started in order to improve and modernize the museum. In 1989 the iconic glass Pyramid was completed.

Mitsubishi Ichigokan Museum - Tokyo

Figure 10 Mitsubishi Ichigokan Museum[322]

[321] http://www.louvre.fr/en/history-louvre

[322] https://mimt.jp/english/about/

The English architect Josiah Conder designed the Mitsubishi Ichigokan, which was initially used as Mitsubishis headquarter. Work started in 1892 and completed in 1894. Soon the structure became too small as Mitsubishi's headquarter and it was rented out. In 1968 demolition took place. In 2006 Mitsubishi announced to rebuild the Mitsubishi Ichigokan in its original form for the use as an art museum. In 2009 construction is completed an in 2010 the museum opens its doors to public.

Museumsquartier - Vienna

Figure 11 Museumsquartier[323]

In 1713 Emperor Charles VI commissioned the famous baroque architect Johann Fischer von Erlach to build an imperial stable complex, including space for 600 horses and 200 coaches, an amphitheater and a large horse pond. The stables were completed in 1725 and soon proved to be too small. In 1809 Napoleon occupies the stables as a stronghold, besieging Vienna. Bombardment from the city damages the stables, which are being renovated and extended in 1815. After 1918 it is being used for fairs. In 1982 talks are being held to redevelop it as shopping city, hotel or cultural forum. Redevelopment as cultural forum is commissioned in 1983 and construction starts in the same year. Nowadays with its 60,000 sqm and 4 million visitors per annum it is one of the largest cultural forums in the world.

National Diet Building - Tokyo

[323] https://www.mqw.at/en

Figure 12 National Diet Building[324]

In the beginning of 20th century Japan was in need of a new National Diet building. In 1918 a public design competition took place. Out of the 118 submitted designs Watanabe Fukuzo's project won the first prize. Construction began in 1920 and it took more than sixteen years to complete it. The design is a hybrid between western and Asian architecture. It has been modernized and refurbished in recent years.

Notre Dam de Paris - Paris

Figure 13 National Diet Building[325]

In 1160 Maurice de Sully was elected as bishop of Paris. He wanted to create a new landmark church worthy representing the church in France. In 1163 Pope Alexander III laid the first stone. In 1345 the cathedral was completed, more than 180 years after the first stone was laid. In 1548 parts were damaged through rioting Huguenots and in 1793 during the

[324] http://www.sangiin.go.jp/eng/guide/annai/index.htm

[325] http://www.notredamedeparis.fr/spip.php?article383

French Revolution the cathedral was severely damaged. In 1845 a 25-year long restoration program started under the supervision of Eugène Viollet-le-Duc. In 1991 a second major restoration program took place.

Pantheon - Rome

Figure 14 Pantheon[326]

The Pantheon represents the best-preserved ancient roman structure in Rome. Its original purpose is unknown but it is suggested, that it has been used as a temple. The current structure is the third Pantheon completed around 125 AD. The building consist of two main parts, the porch in Classical Greek design and the circular main building in Roman style and reminiscent of the Roman bath architecture. The Porch is made out of granite and marble. The circular building's main structure consists of bricks and concrete. The rotunda inside measures 43.2 m in diameter. It is the world's largest unreinforced concrete rotunda. In 608 it was converted into a church. This might have led to the reason why it survived almost 1900 years.

Reichstag - Berlin

[326] http://www.ancient.eu.com/Pantheon/

Figure 15 Reichstag[327]

After the unification of Germany in 1871 Germany was in need of a proper building for the National Diet. In a public architecture competition the proposal of the Frankfurt architect Paul Wallot succeeded. Construction took place between 1884 and 1894. In 1916 the iconic phrase “To the German people” was carved into the main façade. After WW I in 1918 the institution of a republic was announced from a balcony of the building. In 1933 the building caught, under circumstances still unknown, fire. Soon after, the Nazi’s established a dictatorship in Germany and the building remained as a ruin. It got further damaged due to heavy air raids. During the cold war it was part of West Berlin. After WW II it was partly restored but was only used occasionally. Finally in 1991, after the unification of Ost- and West–Germany it was announced to reuse the Reichstag as National Diet building. Norman Foster was appointed with the reconstruction of the building.

Sofiensaal - Vienna

Figure 16 Sophiensaal after the fire[328] and after reconstruction[329]

[327] http://www.bundestag.de/kulturundgeschichte/architektur/reichstag/

[328] http://upload.wikimedia.org/wikipedia/commons/d/da/Sofiensäle_Bauruine.jpg

[329] http://resources.vienna.at/sofiensaele-renovierung-hat-begonnen/news-20110407-01020460-1463577196.jpg

The Sofiensaal was a concert hall in Vienna. In 1826 iitially designed by famous architects Sicard and Van der Nüll as steam bath called “Sofienbad” it was later converted into a dance hall. Beneath the dance floor the pool remained, this gave the concert hall excellent acoustic properties. Johann Strauss the Elder performed and conducted there regularly and his son Johann Strauss the Younger carried on to conduct in the Sofiensaal. Many of the Strauss family’s waltzes were performed there for the first time. In 1926 the Austrian branch of the Nazi party was founded in the concert hall. In the 1950’s it was converted once more into Europ’s principal recording venue. Due to repair works in 2001 the building caught fire and remained as a ruin. In 2013 the Sofiensaal opened its doors once more. The old façade and the great hall were rebuilt.

St.Peter - Rome

Figure 17 St. Peter’s Basilica[330]

In the beginning of the 4th century Emperor Constantine the Great commissioned to build a basilica on the place of the current St. Peter. Papal coronations and the coronation of Charlemagne were held in the old building but by the end of the 15th century the basilica was in bad repair and it the papacy considered a rebuilding. In 1505 Pope Julius II decided to tear down the old structure and replace it. In the next 120 years several popes and architects contributed their ideas to this enormous project among them Bramante (initial design), Michelangelo (redesigned Bramante’s proposal & dome), Maderno (façade & nave) and Bernini (refurbishment & St. Peter’s square). In 1626 the new St. Peter’s basilica was consecrated. Since then it was undertaken several major repairs.

[330] http://www.visit-vaticancity.com/vatican-city-st-peter-basilica.htm

Tokyo Station Marunouchi Exit - Tokyo

Figure 18 Tokyo Station Marunouchi Exit[331]

In 1889 a committee appointed by the municipality of Tokyo supposed a train station in Ueno but in 1896 the Imperial Diet suggested to construct a central station located in front of the Imperial Palace. The work started finally in 1908 and was completed in 1914. Kingo Tatsuno designed the iconic landmark building. Already five years after completion it was extended and two years later in 1921 Prime Minister Hara Takashi was assassinated at the south gate. Due to Japans fast expending railway network another extension took place in 1929. WW II left its mark on the red brick building. It was severely damaged in air raids in 1945. Soon after the end of WW II repair work started but a much simpler design was carried out. In 1953 a rebuilt and extended Yaesu side opened followed by extensions in 1964 and 1991. From 2007 to 2012 it underwent an extensive renovation and modernization. The original design by Tatsuno was restored and the structure was made more earthquake resistant. It is now part of the Tokyo Station City, a modern urban space development project.

The Shrines and Temples of Nikko - Nikko

[331] http://edition.cnn.com/2013/05/07/travel/five-train-stations-worth-a-stop/

Figure 19 Toshogu Shrine[332]

A single temple complex composed of one hundred three religious buildings the Shrines and Temples of Nikko. The first known religious building in Nikko was built in the 8th century. Most of the current buildings were constructed in the 17th century. They are outstanding examples of Japanese temple architecture with unique artistic details. The harmonious integration of the buildings into nature gives the buildings a divine and spiritual atmosphere. The religious importance, the outstanding example of Edo period temple architecture and the natural setting were the reasons why UNESCO made the complex World Heritage. In the last decades it was undertaken several minor and major repairs, all carried out in historic accurate handwork.

Wien Hauptbahnhof (Vienna) Main Station - Vienna

Figure 20 Hauptbahnhof before (Südbahnhof) [333] and the new project[334]

Due to the Industrialization the railway network grew rapidly in Austria, in between 1841 and 1846 two identical stations, the Gloggnitzer and the Raaber station were built perpendicular to each other on the location of the main station. In 1870 Raaber station was replaced by a much bigger

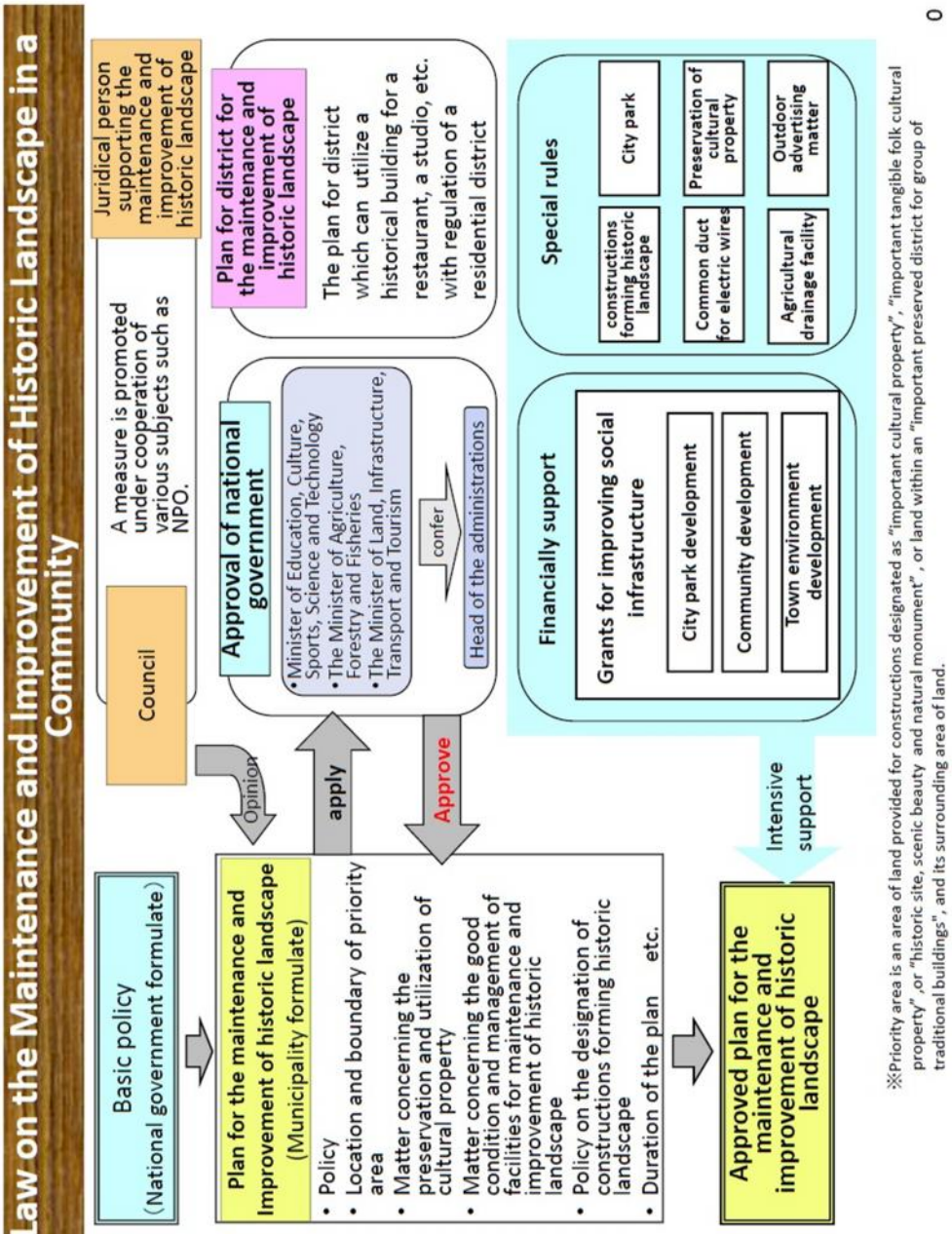
[332] http://whc.unesco.org/en/list/913/

[333] http://www.wien-vienna.at/verkehr.php?ID=1254

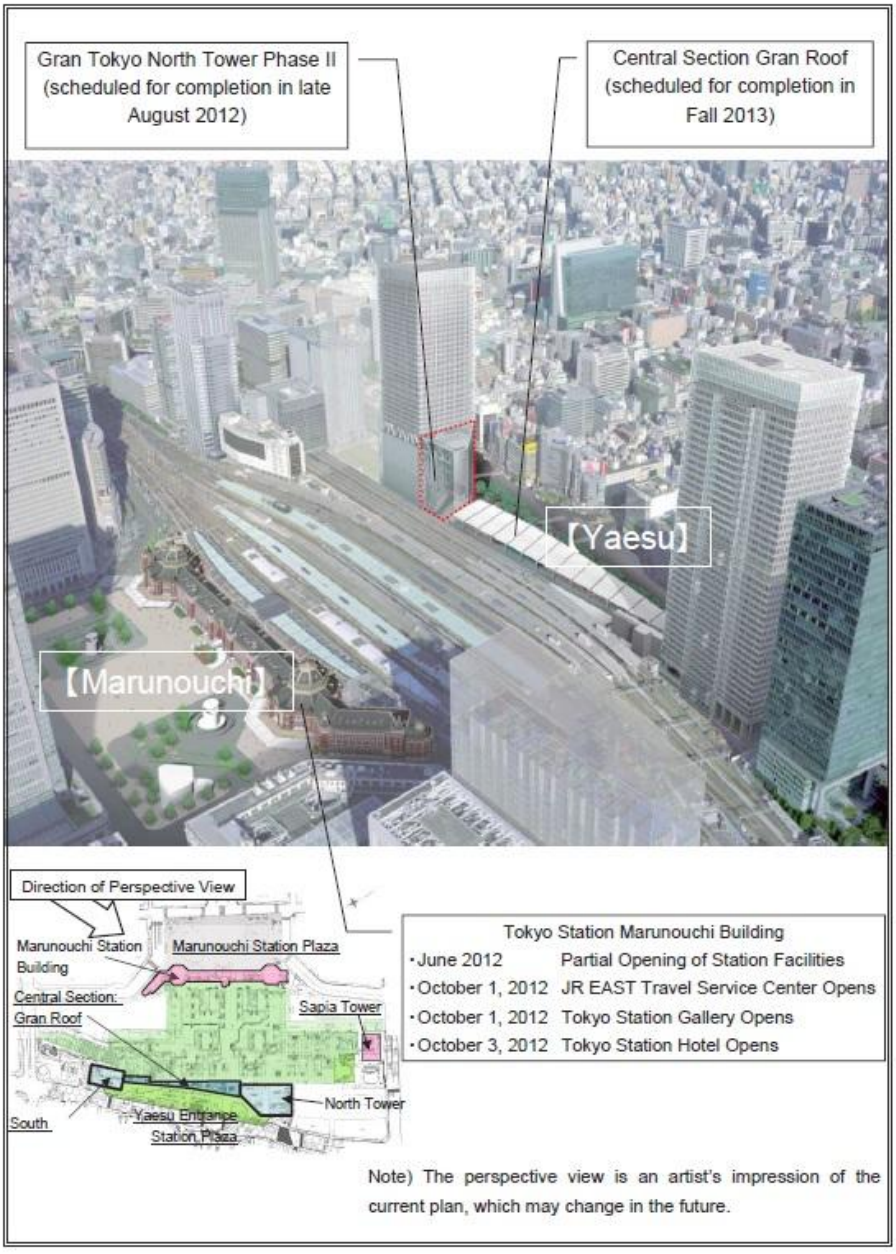
[334] http://www.hauptbahnhof-wien.at/de/Service/Bildergalerien/Visualisierungen_Projektgebiet/index.jsp?imageOid=1305

station, the later called Eastern station and in 1874 the Gloggnitzer station was replaced by the later called Southern station designed in a representative neo-renaissance style. It was an outstanding example of station and “Gründerzeit” design but after WW II the new created public railway organization considered the building as less important and demolished it. It was replaced by a bigger structure designed in the modern style. In 2006 it was announced that the structure should be torn down and a central station with a large-scale urban space development project will be build. Work on the station was completed in 2012. The development project contains more than 550.000 sqm of office space, apartments for more than 13.000 people and a park with 8 ha.

A.2. Law on the Maintenance and Improvement of Historic Landscape in a Community



A.3. Description of the historic buildings in chapter 1.2



History of Tokyo Station

In 1889, the Governor of Tokyo prefecture issued the Tokyo City Improvement Ordinance, setting in motion the construction of an elevated railway line between two terminals, Shimbashi and Ueno. The Tokyo prefectural government also established a plan for the installation of a central station in the middle of Tokyo around the same time. The survey and early scheme of the station were initially entrusted to Hermann Rumshottel and Franz Baltzer, German engineers who were also involved in the design of the elevated city railway stretching between Shimbashi and Ueno. In 1903, the Japanese architect Kingo Tatsuno, who was known for designing the headquarters of Bank of Japan and had established himself as a pioneer of Japanese modern architecture, was commissioned to design the Central Station. He followed the layout plan envisioned by Baltzer, while elaborating the design with his own distinctive features. After several design changes and suspension of the project during the war with Russia, the construction of the Central Station finally began on March 25, 1908. It opened for business about six years later on December 20 after the official announcement that the formal name would be Tokyo Station—an easily recognizable designation for the station at the heart of Japan's growing capital.

Tokyo Station miraculously survived the Great Kanto Earthquake and had remained a majestic landmark of the imperial city for 31 years until it was burnt down in air raids during the World War II in May 1945.

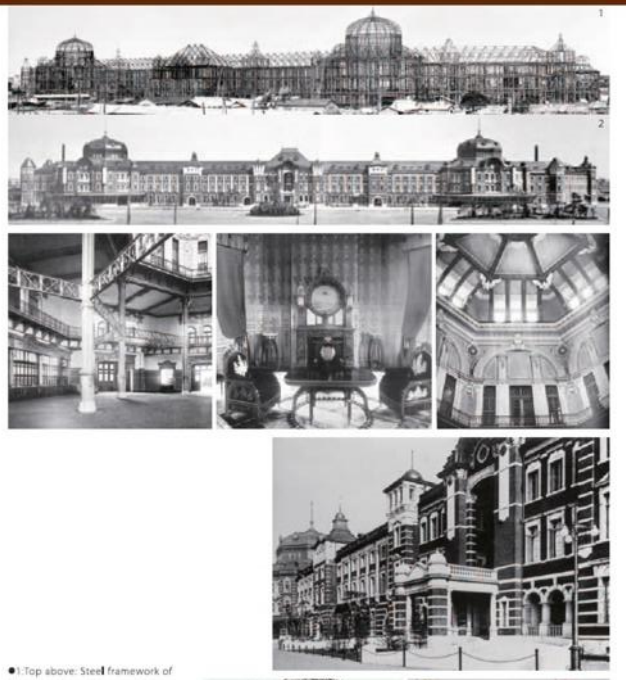
Tokyo Station Timeline

1872	Shimbashi-Yokohama Line opens
1889	Announcement of the City Improvement Ordinance to build the Central Station
1903	Franz Baltzer submits scheme for the Central Station
1903	Kingo Tatsuno appointed as the architect for the Central Station
1910	Kingo Tatsuno submits final plan
1914	Tokyo Station opens
1915	Tokyo Station Hotel opens
1923	The Great Kanto Earthquake (almost no damage to Tokyo Station)
1945	Roof of Tokyo Station damaged during World War II
1947	Tokyo Station reconstructed as a two-story building
1951	Tokyo Station Hotel resumes operation
1964	Tokaido Shinkansen Line opens
1972	Sobu Line opens
1986	The illumination of Tokyo Station Marunouchi Building starts
1988	Tokyo Station Gallery opens
1995	Chuo Line elevated platform opens
2000	Establishment of exceptional floor area ratio districts
2001	The Research Committee for Regeneration and Improvement of the Tokyo Station Area established
2002	Committee for the preservation and restoration of the Tokyo Station Marunouchi Station Building established
2003	Tokyo Station designated as an Important Cultural Property of Japan
2012	Preservation and restoration of Tokyo Station completed

Kingo Tatsuno (1854-1919)

Kingo Tatsuno was a first-generation student of the Technical College of the Imperial University (the predecessor of Tokyo University). On his return to Tokyo, he succeeded Josiah Conder to teach for 18 years at the Technical College and founded the Architectural Institute of Japan in 1886. He started his private practice in 1902.

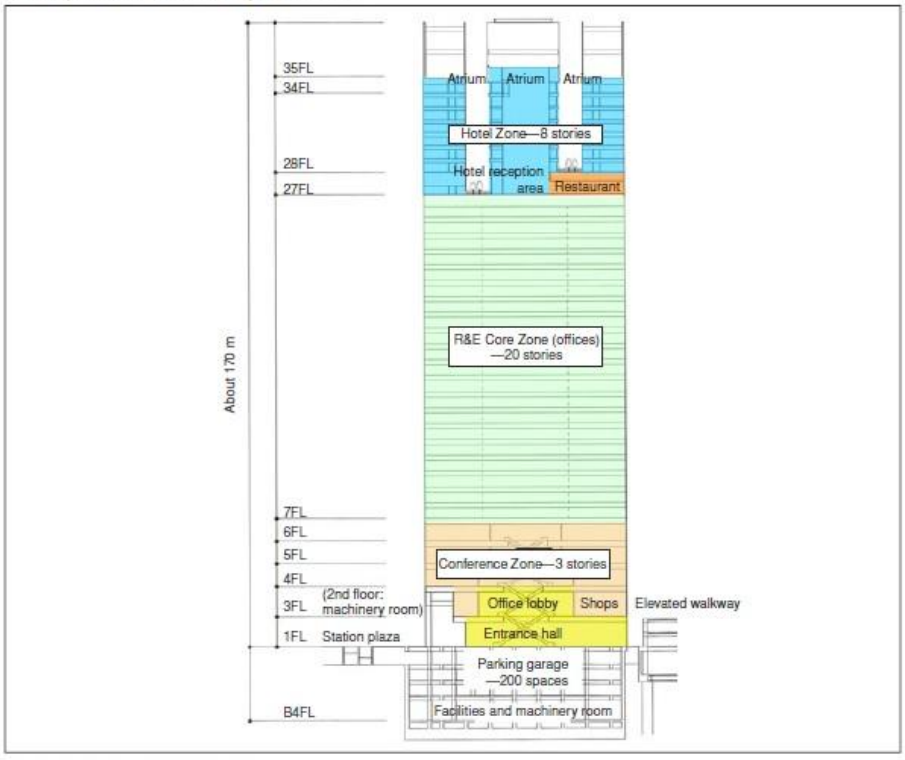
His work features a combination of red brick and granite stone stripes with dome structures that cap a building. His most notable work includes the headquarters for the Bank of Japan (1896), which is characterized by solemn granite stones. He was a pioneer of Japanese modern architecture and undertook over 200 built works throughout the course of his career.



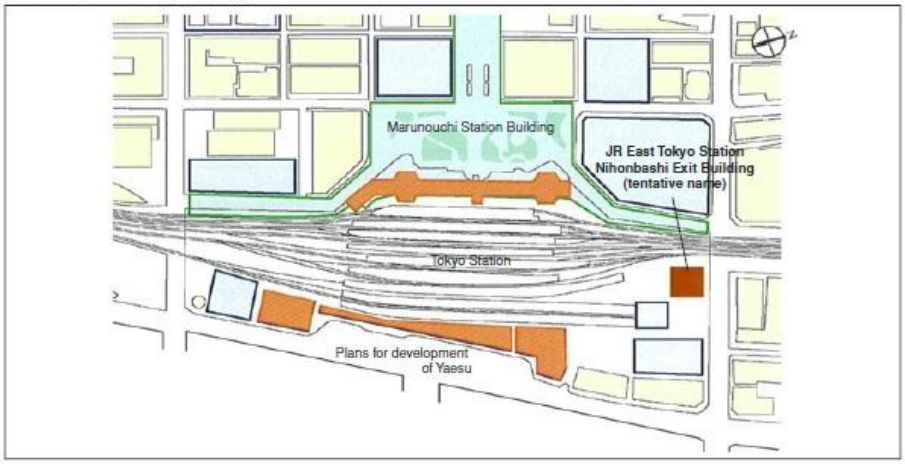
●1:Top above: Steel framework of the station at completion (1911)/2:Top below: On the day of opening (1914)
●Middle left: Dome interior /Middle center: VIP waiting room /Middle right: Vaulted ceiling of dome
●Below: Central entrance
●Bottom left: Reconstruction work in progress/Bottom right: After reconstruction

A.5. Sapia Tower

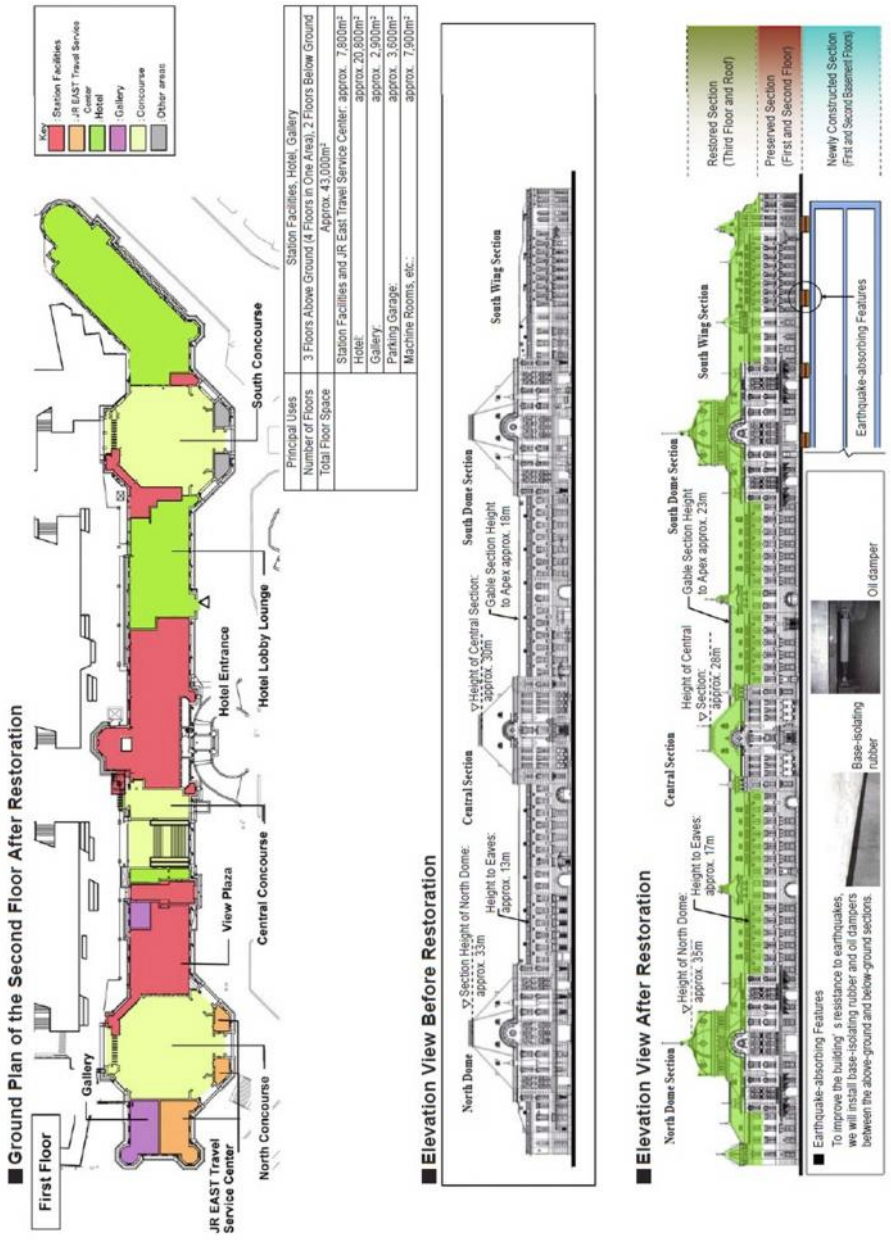
Arrangement of Building Facilities



Location of the Building



A.6. Elevation of Marunouchi Building

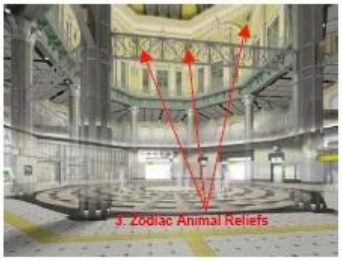


A.7. Preservation of North and South Dome

■ **Façade and Interior of the Station Building**

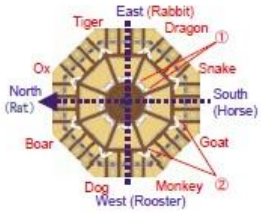
○ We will restore the third floor and north and south domes of the Marunouchi Station Building, as far as possible preserving and utilizing the existing structures.

○ We will restore the interiors of the north and south domes and their relief decoration, based on contemporary photographs and plans.



Dome Interior (Artist's Impression of the North Dome)

Many distinctively Japanese-style motifs were used for the interior decoration of the domes. Architect Kingo Tatsuno explicitly stated that he wanted to "do the decoration in a Japanese style." We decided on the colors for the wall reliefs by reference to a contemporary document that states "the colors are bright" and mentions "egg-yolk yellow plaster," as well as black-and-white photographs taken during the original construction.



View Looking Up to Ceiling of the Dome

1. Flower Decoration Relief (Artist's Impression)

The flower reliefs around the central decoration of the dome's ceiling take the form of clematis plants. A total of 16 are arranged in the north and south domes.

2. Eagle-shaped Relief (Artist's Impression)

The eagle reliefs in the eight corners of the dome's ceiling have a wingspan of 2.1m. A total of eight are arranged in the north and south domes.

3. Zodiac Animal Reliefs (Artist's Impression)

The sculptures in the eight corners of the dome's walls are reliefs of eight of the 12 Zodiac animals, arranged according to the directions they traditionally represent, reading clockwise from the north: Ox (North-Northeast); Tiger (East-Northeast); Dragon (East-Southeast); Snake (South-Southeast); Goat (South-Southwest); Monkey (West-Southwest); Dog (West Northwest); Boar (North-Northwest). The four animals representing the four cardinal points - Rat (North); Rabbit (East); Horse (South); and Rooster (West) - are not depicted.

○ As far as possible, for the roof slates we used Japanese natural slates of a type that withstood the tsunami after the Great East Japan Earthquake. We will position them in symbolic locations on the south and north domes and the central section of the station building.

The Roof of one of the Domes (with Japanese Slate)

A.7. Questionnaire for 1st Interview with Kuniaki Mitani, Deputy General Manager of JR East's Station Development Planning Department

In the 1st interview focus was set on general information, design concept, tendering process and on-site controlling to get a descriptive internal view by JR East's supervising engineer.

General Questions

1. What were the major reasons to preserve and extend Tokyo Station?
2. How was the project organized within the company?
3. How was the decision-making and planning process within JR East Company organized?
4. Who were the participants in the decision-making-process and how were stakeholders involved?
5. Did the authorities impose any conditions and if what kind of?

Design Concept

6. Which role did internal and external design teams play?
7. How and why have external designers been selected?
8. What demands have been required from the design and why has the carried out design been selected?
9. Have there been alternative design concepts and why were they rejected?
10. Have preservation interest and business interest contradicted each other and how did they influence design and decision-making-process?
11. Why was extension underneath Marunouchi Building necessary and what benefits did JR East expect?
12. Did sustainability and environmental friendly design play a role and how did it affect the planning process?
13. How much did maintenance and the possibility of future adaptation influence the planning process?
14. What were the greatest challenges in the planning process?

Time & Financial Aspect

15. How was the initial time schedule determined and organized? Was the project on time and if not what caused the delay?
16. What was the main reason to construct during operation hours and what did this decision effect time and costs?
17. How was cost estimation carried out?

18. What were planned costs and were final costs as planned?
19. How was the project funded? What made it possible to sell building height above Marunouchi Building?

Contractor

20. What sort of tendering process took place?
21. What terms and condition have been included?
22. What were the main reasons to select contractors? Why were different joint-ventures appointed?
23. What type of contract was selected?
24. Was claim management implemented and how was it organized?

Controlling

25. What risks have been predicted and how were they mitigated?
26. What tools have been used to monitor and evaluate the construction progress?
27. How have anomalies in the construction process been corrected?
28. Did JR East have a change management and how was it conducted?

A.8. Questionnaire for 2nd Interview with Kuniaki Mitani, Deputy General Manager of JR East's Station Development Planning Department

In the 2nd interview focus was set on the different committees, construction period and risks arose from underground construction as well as integration of Tokyo Station with its surroundings in order to obtain deeper understanding of decision-making-process.

Work of the Committees and Decision Making

1. Did the participation at the Advisory Committee Otemachi-Marunouchi-Yurakucho Area Development and the OMY Redevelopment Project Council influence the decision-making-process of JR East?
2. Why did JR East initially plan to demolish Tokyo Station?
3. What role did the "Research committee on redevelopment of Tokyo Station" as well as the preservation committee play in the decision-making-process and is it possible to obtain their final reports?

4. In February 2002 announcement of preservation of Marunouchi Exit was made, in October Urban planning committee announced Tokyo Station as Priority Urban Development Area, a crucial point for the project. Was JR East in this decision involved?
5. Did the announcement of Marunouchi building as an important cultural property this have any effects on the ongoing plans?

Construction Site

6. Is it possible to obtain information about costs and time?
7. Are detailed information about underground construction, such as timetables, costs, used building methods, available?
8. Are plans about foundations of Sepia, North and South Tower, as well as more information of earthquake resistance measurements available?
9. Are plans and pictures during construction period available?
10. A delay due to the Tohoku earthquake was mentioned, do detailed information about impact on the project, such as related damage, delay and costs, exist?

Yaesu Exit, Sepia Tower and surroundings

11. What made a Joint Venture with Mitsui/Kokusai and a Joint Venture with Kashima/Nippon Oil possible?
12. How were these joint ventures organized?
13. What is the average office and retail rental rate per square meter in the Sepia, North and South Tower and how high is the vacant rate?
14. What benefits for JR East arose from the project?
15. Mitsubishi is promoting public-private collaborative disaster prevention for the Marunouchi area, does JR East take part in this movement and if how?

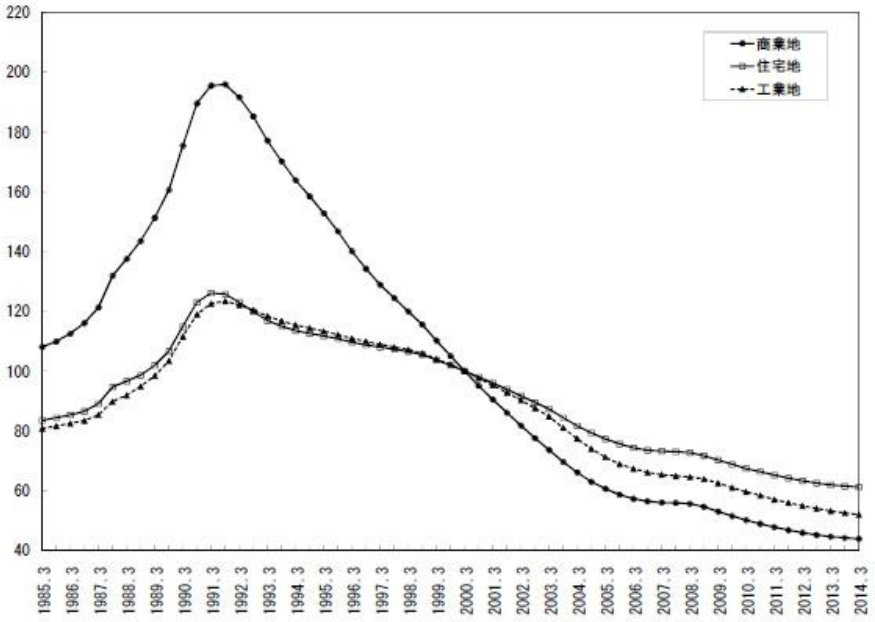
A.9. Nationwide Development of Land Price

1 全国 [Nationwide]

平成12年3月末 (End of Mar.2000) = 100

月末 End of Month		商業地 Commercial			住宅地 Residential			工業地 Industrial			全用途平均 Average of Three Categories			最高価格地 The Highest Price Lot		
			前期比 (%) *1	前年同期比 (%) *2		前期比 (%) *1	前年同期比 (%) *2		前期比 (%) *1	前年同期比 (%) *2		前期比 (%) *1	前年同期比 (%) *2		前期比 (%) *1	前年同期比 (%) *2
昭和60.3	Mar.1985	108.1	1.5	3.1	83.5	1.3	2.7	80.8	1.1	2.4	91.5	1.3	2.8	121.3	2.1	4.0
平成02.3	Mar.1990	175.4	9.2	15.9	114.9	7.7	12.8	111.6	7.9	13.4	133.9	8.3	14.1	226.1	10.6	18.8
07.3	Mar.1995	152.8	-3.6	-6.8	111.8	-0.7	-1.5	113.3	-1.0	-1.8	126.1	-1.9	-3.7	185.9	-5.6	-10.2
12.3	Mar.2000	100.0	-4.8	-9.2	100.0	-1.9	-3.5	100.0	-2.1	-3.9	100.0	-3.1	-5.8	100.0	-6.5	-12.3
21.9	Sep.2009	51.5	-2.8	-5.7	68.8	-2.0	-4.1	61.0	-2.4	-4.5	59.9	-2.4	-4.8	46.8	-3.2	-6.6
22.3	Mar.2010	50.1	-2.7	-5.4	67.4	-2.0	-3.9	59.6	-2.3	-4.6	58.5	-2.3	-4.6	45.4	-3.1	-6.2
22.9	Sep.2010	48.9	-2.4	-5.0	66.3	-1.7	-3.6	58.4	-2.1	-4.4	57.3	-2.1	-4.3	44.2	-2.6	-5.6
23.3	Mar.2011	47.8	-2.4	-4.7	65.2	-1.7	-3.4	57.0	-2.3	-4.4	56.1	-2.1	-4.1	43.0	-2.7	-5.3
23.9	Sep.2011	46.8	-2.0	-4.4	64.2	-1.5	-3.2	55.9	-1.9	-4.1	55.1	-1.8	-3.8	42.1	-2.2	-4.8
24.3	Mar.2012	45.9	-1.8	-3.8	63.3	-1.4	-2.9	54.9	-1.9	-3.7	54.2	-1.7	-3.4	41.3	-1.9	-4.1
24.9	Sep.2012	45.2	-1.6	-3.4	62.5	-1.2	-2.6	54.0	-1.7	-3.5	53.4	-1.5	-3.1	40.6	-1.7	-3.6
25.3	Mar.2013	44.6	-1.4	-2.9	61.9	-1.0	-2.2	53.2	-1.5	-3.1	52.7	-1.2	-2.7	40.0	-1.3	-3.0
25.9	Sep.2013	44.2	-1.0	-2.3	61.5	-0.7	-1.7	52.5	-1.2	-2.6	52.3	-0.9	-2.1	39.7	-0.9	-2.2
26.3	Mar.2014	43.8	-0.7	-1.7	61.2	-0.5	-1.2	52.0	-1.0	-2.1	51.9	-0.7	-1.6	39.5	-0.5	-1.4

*1 percent change from previous half-year *2 percent change from previous year



A.10. Office Rent Index

表Ⅰ-1-1 オフィス賃料指数
Table Ⅰ-1-1 Office Rent Index

		2013		2012		2011	
		指数 Index (2005=100)	変動率 y/o/y change	指数 Index (2005=100)	変動率 y/o/y change	指数 Index (2005=100)	変動率 y/o/y change
全国 Nationwide		89.2	−0.2%	89.4	−1.0%	90.2	−2.8%
地方別 Region	北海道地方 Hokkaido Region	96.2	−0.2%	96.4	−0.2%	96.6	−1.0%
	東北地方 Tohoku Region	80.3	−0.5%	80.7	−0.6%	81.1	−3.8%
	関東地方 Kanto Region	89.0	0.2%	88.8	−0.5%	89.2	−2.7%
	北陸地方 Hokuriku Region	80.9	−1.6%	82.2	−4.0%	85.6	−4.3%
	中部・東海地方 Chubu/Tokai Region	89.5	−0.3%	89.8	−2.0%	91.6	−2.2%
	近畿地方 Kinki Region	86.3	−0.6%	86.9	−1.6%	88.3	−4.2%
	中国地方 Chugoku Region	95.0	−0.2%	95.2	−0.5%	95.7	−0.9%
	四国地方 Shikoku Region	85.9	−1.3%	87.1	−1.8%	88.7	−3.1%
	九州地方 Kyushu Region	91.0	−0.9%	91.9	−0.9%	92.7	−1.5%
	沖縄地方 Okinawa Region	97.7	0.0%	97.7	−1.2%	98.8	−1.2%
都市圏別 Metro Area	東京圏 Tokyo Metropolitan Area	89.0	0.3%	88.7	−0.4%	89.1	−2.8%
	東京都区部 Tokyo Metropolitan Wards	88.4	0.5%	87.9	−0.2%	88.1	−2.1%
	大阪圏 Osaka Metropolitan Area	86.2	−0.6%	86.7	−1.6%	88.2	−4.5%
	名古屋圏 Nagoya Metropolitan Area	90.1	0.0%	90.1	−2.1%	92.0	−2.2%
	三大都市圏以外 Other Areas	89.0	−0.8%	89.7	−1.2%	90.8	−2.1%
都市規模別 City	政令指定都市 Designated Cities	89.3	0.0%	89.3	−0.7%	89.9	−2.9%
	六大都市 Six Major Cities	88.2	0.1%	88.1	−0.7%	88.8	−3.1%
	六大都市以外 Other Designated Cities	91.7	−0.2%	91.9	−0.6%	92.4	−2.1%
	政令指定都市以外の都市 Non-Designated Cities	87.2	−1.2%	88.3	−1.9%	90.0	−2.3%
	30万人以上 300,000+ Population	87.4	−1.3%	88.5	−2.1%	90.4	−2.3%
	30万人未満 Other Non-Designated Cities	86.9	−1.1%	87.8	−1.4%	89.1	−2.3%

A.11. Apartment Rent Index

表Ⅰ-1-3 共同住宅賃料指数
Table Ⅰ-1-3 Apartment Rent Index

		2013		2012		2011	
		指数 Index (2005=100)	変動率 y/o/y change	指数 Index (2005=100)	変動率 y/o/y change	指数 Index (2005=100)	変動率 y/o/y change
全国 Nationwide		96.8	−0.2%	97.0	−0.3%	97.3	−0.4%
地方別 Region	北海道地方 Hokkaido Region	96.1	−0.1%	96.2	−0.2%	96.4	−0.2%
	東北地方 Tohoku Region	102.3	1.2%	101.1	1.5%	99.6	−0.2%
	関東地方 Kanto Region	96.0	−0.1%	96.1	−0.3%	96.4	−0.4%
	北陸地方 Hokuriku Region	96.8	−0.4%	97.2	−0.4%	97.5	−0.3%
	中部・東海地方 Chubu/Tokai Region	98.0	−0.2%	98.2	−0.2%	98.4	−0.2%
	近畿地方 Kinki Region	97.7	−0.4%	98.1	−0.4%	98.4	−0.3%
	中国地方 Chugoku Region	98.5	−0.1%	98.6	−0.2%	98.8	−0.2%
	四国地方 Shikoku Region	86.3	−1.4%	87.6	−2.5%	89.8	−2.6%
	九州地方 Kyushu Region	97.0	−0.3%	97.3	−0.4%	97.7	−0.6%
	沖縄地方 Okinawa Region	99.8	0.0%	99.8	0.0%	99.8	0.0%
都市圏別 Metro Area	東京圏 Tokyo Metropolitan Area	96.3	−0.1%	96.3	−0.2%	96.6	−0.3%
	東京都区部 Tokyo Metropolitan Wards	92.6	−0.1%	92.7	−0.3%	92.9	−0.5%
	大阪圏 Osaka Metropolitan Area	97.7	−0.4%	98.1	−0.4%	98.5	−0.3%
	名古屋圏 Nagoya Metropolitan Area	99.0	0.0%	99.0	−0.1%	99.2	−0.2%
	三大都市圏以外 Other Areas	96.6	−0.2%	96.8	−0.4%	97.1	−0.6%
都市規模別 City	政令指定都市 Designated Cities	97.1	−0.1%	97.2	−0.1%	97.3	−0.3%
	六大都市 Six Major Cities	95.7	−0.2%	95.9	−0.2%	96.1	−0.3%
	六大都市以外 Other Designated Cities	100.2	0.1%	100.1	0.2%	99.9	−0.2%
	政令指定都市以外の人口15万人以上の都市 Non-Designated Cities with 150,000+ Population	96.3	−0.3%	96.6	−0.6%	97.2	−0.6%
	30万人以上 300,000+	97.0	−0.3%	97.3	−0.6%	97.8	−0.5%
	15～30万人未満 150,000 – 300,000	94.2	−0.5%	94.7	−0.8%	95.5	−0.9%
	人口15万人未満の都市 Other Non-Designated Cities	97.1	−0.2%	97.4	−0.4%	97.7	−0.5%
	10～15万人未満 100,000 – 150,000	96.5	−0.3%	96.8	−0.4%	97.2	−0.7%
	10万人未満 Less than 100,000	98.2	−0.1%	98.3	−0.2%	98.6	−0.2%

Glossary

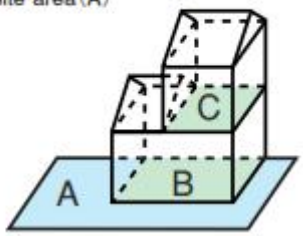
Cluster Analysis grouping a set of objects or information such that objects or information are similar to each other in same cluster but different to other cluster.

Cut and Cover Method method to construct shallow tunnels, especially used for inner-city tunnels. Thereby a trench is excavated and roofed with a support system. Excavation takes place underneath the support system.

Building Coverage Ratio[335]

●Building Coverage Ratio (BCR)

$$BCR(\%) = \frac{\text{building area (B)}}{\text{site area (A)}} \times 100$$



Floor Area Ratio[336]

●Floor-Area Ratio (FAR)

$$FAR(\%) = \frac{\text{total floor area (B+C)}}{\text{site area (A)}} \times 100$$

Lump sum contract a contract under which a principal (customer or owner) agrees to pay a contractor a specified amount for completing work without requiring a cost breakdown. [337]

Meiji era historical era in Japan from September 8th, 1868 until July 30th, 1912 under the reign of Emperor Meiji. Fundamental changes within this era moved Japan from a feudal society towards a modern industrialized nation.

Modernization in this paper modernization is referred to redesign of outdated structures according to modern needs for sustainable utilization.

Net Income total revenue in an accounting period minus all expenses during the same period including taxes. [338]

Net Sales revenues earned by selling products or rendering services.

[335] Urban Land Use Planning System in Japan, MLIT, 2014, Page 5

[336] Urban Land Use Planning System in Japan, MLIT, 2014, Page 5

[337] http://www.businessdictionary.com/definition/lump-sum-contract.html, on September, 14th, 2014

[338] http://www.businessdictionary.com/definition/net-income.html, on September, 14th, 2014

Operating Income — income resulting from a firm's primary business operations, excluding extraordinary income and expenses. [339]

Operating Margin — operating margin is operating income divided by net sales. Operating margin gives an accurate picture of a firm's profitability. [340]

Passenger Kilometres — measure unit, total kilometres travelled by a passenger.

Preservation — endeavour to protect artefacts of historical significance, in particular process to conserve the original appearance of a historical structure.

REIT — or Real Estate Investment Trust is an investment vehicle similar to a mutual fund (unit trust). REITs use pooled capital of several investors to make mortgage loans to builders or developers, or to directly invest. [341]

Return Rate — or return on investment (ROI). The earning power of assets measured as ratio of net income (profit less depreciation) to average capital employed (or equity capital) in a company or project. Expressed usually as a percentage, return on investment is a measure of profitability.[342]

[339] http://www.businessdictionary.com/definition/operating-income.html, on September, 14th, 2014

[340] http://www.businessdictionary.com/definition/operating-margin.htm, on September, 14th, 2014

[341] http://www.businessdictionary.com/definition/real-estate-investment-trust-REIT.html, on September, 14th, 2014

[342] http://www.businessdictionary.com/definition/return-on-investment-ROI.html, on September, 14th, 2014

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