Re-development of Waterway system in Nihombashi River

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ABSTRACT: Nihombashi is located in the central area of Tokyo, Japan. Tokyo has been the capital in Japan since the Edo period, which started approximately 400 years ago, and has accepted a variety of cultures, human resources, businesses for the last 400 years. This has resulted in building up the present prosperity. The Sumida River, one of the symbols of Tokyo and its tributaries including the Kanda River and the Nihombashi River, flows through the Nihombashi district. The river and tributaries used to benefit to the City of Edo. Due to the economic development and the industrial growth in Tokyo, however, they were polluted and lost their functions. In 1960s, approximately 40 years ago, the Sumida River became so dirty that local citizens kept away from it. The Nihombashi River was covered with an expressway, which was obscuring the river view. Since 1970s, local communities have proposed to rehabilitate rivers in Tokyo successively, and have proceeded with measures for river floods, improvement of sewage systems and construction of water purification facilities. Consequently, the quality of the river water was considerably improved in 1990. The stagnant rivers were turned into ones that local citizens were physically able to come close by. Today, restoring of the environment and the appearance of the city in the old days, Nihombashi district has been proposed as a model city of the future, which is alive with history and culture and harmonizing with rivers. The concept is "To Create, To Reserve, To Restore." This paper introduces a case study of the urban development, in which the local communities and public authorities collaborated with and proposed a brand-new style of the urban city harmonizing with the environment.

1 INTRODUCTION

The Nihombashi district has grown as the "City of Water" since the Edo period. When Iyeyasu Tokugawa, the founder and the first shogun of the Tokugawa Shogunate, established Edo Castle, Nihombashi district, where was the boundary between samurai and merchants, craftsmen, has been built the basis of the city where mixed diverse culture all over the Japan. Under those circumstances, the origin of today's Nihombashi district was created. At the time, one had already been able to purchase products from all over Japan. Merchandises from overseas were also available and imported by ship. The Nihombashi district was truly a central prosperous area with waterway transportations. In the 1960s, however, the channels were reclaimed and the rivers were covered with expressways due to the Japanese rapid economic growth. This consequently destroyed the townscape of the Nihombashi district in a short period of time. This paper introduces the residents' actions toward the harmonization of urban development and the environment in the Nihombashi district with the goal to restore the prosperity from the social, economic and environmental points of view, especially to develop or re-develop of the navigation system in Nihombashi River with tourism.

2 FORMATION OF THE TOKYO AND WATERWAY TRANSPORTATION

2.1 Formation of the Tokyo

Tokyo was named after the Imperial Prescript in September of 1868, which mentioned to rename of Edo to Tokyo. The name of Tokyo had begun to use when Tokyo prefecture, governed the area of

town magistrate in Edo Shogunate was established. The meaning of Tokyo is the city which is located in east side of Kyoto. Nihombashi district, intended for this paper, was formed the original shape of town in Edo period. However, when Ieyasu Tokugawa made a triumphal entry to Edo in 1590, the district including the current Nihombashi and Marunouchi was located on the peninsula, called “Edomaejima”, and the district including the current Kokyo-Gaien, Hibiya Park and Shimbashi was the sea called “Hibiya Inlet” (Figure 1). In order to transport materials to the Edo Castle, a canal called “Dosanbori” was excavated (Figure 2). Since then, reclamation of the “Hibiya Inlet” had been under consideration. A river diversion was developed to make the Hira River, which flows into “Dosanbori”. This is the origin of the current Nihombashi River.

The paper must be written in English. The base font is Times Roman, or, if not possible, a similar font. Body text is 10 pt. Body text immediately after a heading is not indented. New paragraphs in the body text proper start with a 0.5-cm indentation. Single line spacing is used, and text is evenly justified. With the purpose of facilitating transportation of materials, canals and channels were developed successively. The Sotobori River, which was necessary for the construction of the Edo Castle, was developed in such a way that it runs through “Edomaejima” (1605 - 1608).

The Hibiya Inlet was reclaimed, and then an inner moat and a channel network around the moat were developed. For the waterway transportation, a number of ports were built in the vicinity of Hacchobori (Figure 3). Furthermore, construction of the five major routes (Gokaido) starting from Nihombashi got underway while the inner moat and channel network were being developed.

Along the channels, a number of river ports were constructed with the aim of unloading materials. The total number of river ports developed during the Edo period reached approximately 60. Combined with the ones developed during the Meiji period, this number reached approximately 70. This implies that materials from all over Japan were carried to Edo by boat.

Fig.1. Topographical map of Early Edo(1590)

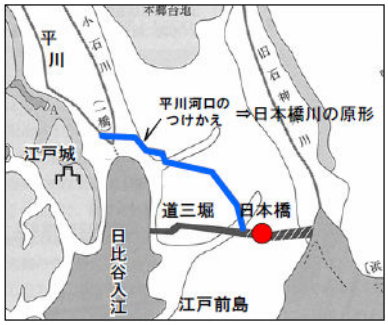

Fig.2. Replacement of the mouth of Hirakawa Rive

Fig.3. The channels constructed under the reign of Tokugawa (1611 -14)

2.2 Growth of waterway transportation

Figure 4 shows the appearance of Nihombashi district during the early part of the Edo period. It depicts unloading at all parts of the riverbanks. This implies that waterway was a popular mode of transportation. Figure 5 shows the appearance of Nihombashi-kitazume during the latter phase of the Edo period. This district was largely populated, which implies prosperity of the city. There were a number of warehouses along with the river, and the boats loading merchandize docked in front of the warehouses. There was also a fish market (Uogashi) in this area, and it made the district prosperous and crowded with people. The fish market had been located there until it was relocated to Tsukiji, Tokyo after the Great Kanto Earthquake in 1932.

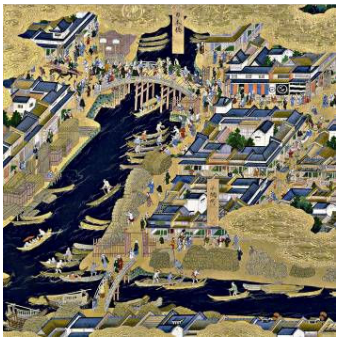

Fig.4. The Landscape around the Nihombashi Bridge in early Edo (1600 -1700)

Fig.5. The Landscape around the Nihombashi Bridge in latter Edo (1805)

2.3 Turning point

The Japanese post-war economic miracle brought in a turning point to the rivers in Tokyo. Due to the shift of transportation means from boat-based to land-based, the rapid economic growth, the 1964 Olympic games held in Tokyo and other reasons, the channels were reclaimed and expressways were built above the rivers. The Nihombashi River was not an exception. The river surface was covered with an uplifted expressway. Figure 6 shows the expressway piers being built in front of Nihombashi. Figure 7 shows the current state of the expressway piers. The sky view above the river was blocked by the expressway. The revetment is a vertical wall made of concrete. Structures along the river stand facing their back to the river. The circumstances under which one was able to benefit by the rivers and enjoy the rivers were entirely gone.

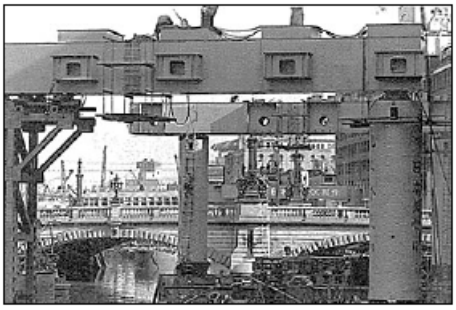

Fig.6. The construction of the Metropolitan Expressway (around 1962)

Fig.7. Present Photo of Nihombashi Bridge

3 CURRENT WATERWAY TRANSPORTATION IN TOKYO

3.1 The number of boats and navigators in Tokyo

The Table 1 shows the number of providers in navigation in rivers, such as Sumida River, canals, Tokyo Bay and Tokyo Port. Papers are limited to 10 printed pages. Authors should avoid having more than half an empty page for the last page of their paper.

Table 1. River Transportation providers in Tokyo

Operational style	**Name of providers**	**Purpose of operation**	**Number of boats**	**Main routes**
Private sectors regular services	Tokyo Cruise Ship CO.,LTD	sightseeing, transportation	11	Sumida River, Tokyo Port
	Kanko kisen kogyo CO.,LTD	Sightseeing, transportation	3	Tokyo Port, Shibaura Canal
Private sectors Non-regular services	Tokyo Cruise Ship CO.,LTD	Parties, excursion	8	Sumida River, Tokyo Port
	Crystal Yacht Club	Parties, excursion	1	Tokyo Port, Tokyo Bay
	Tokyo Vingt et un cruise	Parties, excursion	1	Tokyo Port, Tokyo Bay
	Sealine Tokyo	Parties, excursion	2	Tokyo Port, Tokyo Bay
	Kanko kisen kogyo CO.,LTD	Parties, excursion	3	Sumida River, Odaiba, Tokyo Port
	Zeal Cruise Division	Parties, excursion	3	Sumida River, Odaiba, Tokyo Port
	Funasei	Parties, excursion	1	Sumida River, Odaiba, Tokyo Port
	Minamo	Parties, excursion	1	Sumida River, Odaiba, Tokyo Port
	S.S. Marine Service	Parties, excursion	3	Sumida River, Odaiba, Tokyo Port
	26 Old-fashioned houseboats companies	Parties, excursion	26	Sumida River, Odaiba, Tokyo Port
	34 Fishing boats companies	Fishing	34	Tokyo Port
Public regular services	Tokyo Metropolitan Park Association	Sightseeing, transportation	2	Sumida River, Odaiba, Arakawa River, Tokyo Port
Public non-regular services	Tokyo Metropolitan Park Association	Parties, excursion	2	From Ryogoku to Sumida River estuary
Nonprofit Organization Non-regular services	NPO: Enjoy Eco School	Studies, experiences, events	Charter 2	Kanada River, Nihonabashi River, Onagi River, Shibaura Canal
	NPO: Enjoy waterfront in Koto City	Studies, experiences, events	Charter	Onagi River
	NPO: Enjoy Japanese Old-fashioned boat	Studies, experiences, events	7	Yokojikken River
	NPO: Kanda Gakkai	Studies, experiences, events	Charter	Kanda River
	NPO: Boat club in Kanda River	Studies, experiences, events	Charter	Kanda River
	NPO: Kanda River Network	Studies, experiences, events	Charter	Kanda River
	NPO: Restoration for Kanda River	Studies, experiences, events	Charter	Kanada River
	NPO: Community Development for the Lagoon city of Chuo City	Studies, experiences, events	charter	Kanda River, Nihombashi River, Sumida River
	Consortium of Rediscovery Edo-Tokyo Tourism Walk (CREW)	Sightseeing, events	1	Sumida River, Nihombashi River, Shibaura Canal

Overall, 79 organizations, approximately over 100 boats, provide services. There are 3 organizations, 15 boats that provide regular services.

3.2 Docks

There are major 17 docks that support more than 100 boats navigation (table 2). There are many other small docks that can tie up fishing boats and old-fashioned houseboats.

Table 2. Existing major docks in Tokyo

Places	Function	Related water bodys	formats	Remarks
Asakusa	Water transportation, disaster prevention	Sumida River	Floating pier	Private installation, Tokyo Cruise Ship CO.,LTD arrivals and departures
Azumabashi	Water transportation	Sumida River	Floating dock	
Ryogoku	Water transportation	Sumida River	Floating pier	Tokyo Mizube Cruising Line arrivals and depertures
Hamacho	Water transportation	Sumida River	Floating pier	Tokyo Mizube Cruising Line arrivals and depertures
Hakozaki	Water transportation	Sumida River	Floating pier	
Ecchujima	Water transportation	Sumida River	Floating pier	Tokyo Mizube Cruising Line arrivals and depertures
Shinkawa	Water transportation	Sumida River	Floating pier	
Akashicho	Water transportation	Sumida River	Floating pier	Tokyo Mizube Cruising Line arrivals and depertures
Hamarikyu	—	Tokyo Port	Floating pier	Private installation, Tokyo Cruise Ship CO.,LTD and Tokyo Mizube Cruising Line arrivals and departures
Toyosu	—	Tokyo Port	Floating pier	Private installation, Tokyo Cruise Ship CO.,LTD and Tokyo Mizube Cruising Line arrivals and departures
Shibaura	—	Tokyo Port	Floating pier	Private installation, kanko kisen kogyo
Hinode Sanbashi	Water transportation, disaster prevention	Tokyo Port	Floating pier	Private installation, Kanko kisen kogyo
Izumibahshi	Disaster prevention	Kanda River	Floating pier	
Ichibei	Water transportation	Kanda River	Floating pier	
Misakicho	Water transportation	Nihombashi River	Floating pier	
Takaradabashi	Water transportation	Nihombashi River	Floating pier	
Tokiwabashi	Water transportation	Nihombashi River	Floating pier	

Water transportation: acceptance of critical materials, interim storage, transhipment of regional transit base, vendor campus. Disaster prevention: shipping terminal at the time of disaster

3.3 The number of passengers of navigation services

Approximately 4.3 billion tourists visit Tokyo metropolitan area. Average yearly number of passengers of regular navigation services are 2.15 million passengers; approximately 2 million in Tokyo Cruise Ship CO.,LTD in 2003, and 150 thousands million Tokyo Mizube Cruising Line in 2007. Water front tourism development has been flourished then the numbers of providers are increasing year after year.

4 REVIEWING THE ROLES OF WATER TRANSPORTATION FOR NIHOMBASHI RESTORATION PROJECT

In 2006, the "Nihombashi River Sky View Restoration Committee" was formed by four scholars with the aim to restore the sky view above the Nihombashi River and to recover the urban space full of beauty, culture and prosperity. The city planning for the future Nihombashi district has been discussed repeatedly. On September 15th, 2006, a proposal titled "Towards the new city planning, starting from the Nihombashi district" was submitted to the Prime Minister Junichiro Koizumi (at the time), which states a plan to remove an expressway covering the Nihombashi River and to relocate it under the ground.

In September, 2006, along with this proposal, the "Nihombashi Restoration Promotion Conference" was formed in the district. Since then, an image of the city of the future has been under discussion including measures for water quality improvement. The following is part of the summary of the Waterfront Restoration Research Group meeting.

4.1 Basic concepts

The Water Restoration Research Group considers the Nihombashi district as an area to create "brand-new relationships among rivers, humans and the city". The group adopted the following image concept for the waterfront restoration: "A city that can grow and be succeeded to the next generation with considerations of what to reserve, what to create and what to restore".
This is an attempt to revive the waterway transportation system originated during the Edo period, and to reconstruct the city around the Nihombashi River where people can get together. This is a plan to create a city for a newly coming era with a focus on the waterfront and to treasure the tradition and the culture of the Nihombashi original style.

4.2 The future Image of the city

Figure 8 is an aerial view of the whole area showing the relation between the rivers and the city by placing a river in the center of the view. The height of the structures along the river is kept relatively low limited to two-story heights or so, and some recreational facilities are set up. Riverbanks should be restored as an attractive place where the promenade runs on the revetment and so on.
Figure 9 is an image of the port near Nomura Securities Co., Ltd. (located on the right bank downstream side of the river). The idea is to regain the prosperity of the past by redeveloping the district as a base place for sightseeing and gatherings through redevelopment of the waterway transportation and to create a brand-new city where the boats join the land to the rivers, centering around Nihombashi. From the structure's appearance point of view, it is proposed to make the streets attractive blending with the historical structures being built in the Meiji period and the tradition and the culture being nurtured in Nihombashi. Furthermore, it is also proposed to improve the excursion for visitors and to incorporate with the neighborhood of the Nihombashi district by reconstructing the wooden Nihombashi (the bridge) for pedestrians, restoring the outer moat (Sotobori) extending toward Yaesu, improving the channels extending to Tokyo Station and other measures.

It will take a long time for such an urban planning to materialize. To achieve the goal, it is important to make steady progress in whatever we can do at this moment.
It has been considered that certain key actions should be conducted ahead of time. One of these actions is the "Nihombashi River Port Plan". The river port is a symbol of the waterway transportation which supported the prosperity in the Nihombashi district, and an essential facility to join the cities to the rivers. There are a variety of sightseeing resources at the riverfront and at the coastal area such as Asakusa, Tsukiji, Harumi, Odaiba, Toyosu and Tokyo Disneyland. In the next

three years, construction of the new Tokyo Tower (Tokyo Sky Tree) will be finished. Furthermore, the Haneda Airport will be under expansion and will become an international airport in a couple of years. The river port at Nihombashi will help connecting those districts.
This may bring potential increase of the tourism (Figure 10).

Fig.8. The image of Nihombashi Bridge future conception

Fig.9. The image of Nihombashi Bridge river port.

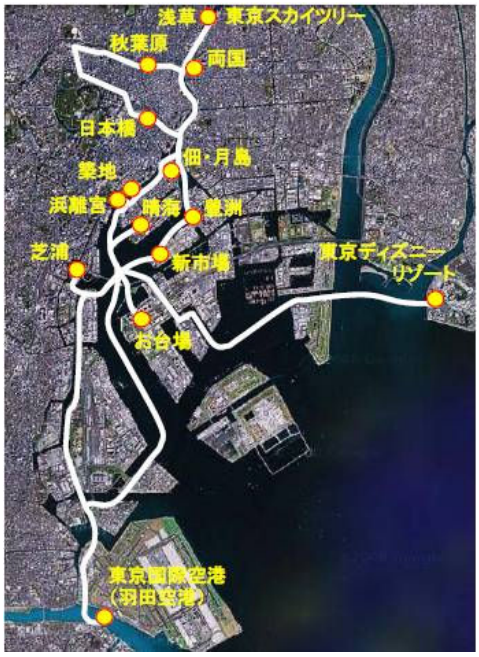

Fig.10. The image of river cruise routes from Nihombashi Bridge.

5 THE FUTURE FRAMEWORK AND PROJECT MASTER PLANNING

Nihombashi district has been lived together with navigation since Edo period. Water ways had been reclaimed, and navigation transportation had been no longer main transportation along with economic development. Even though the roles of community were changed with economic development, local residents notice the effectiveness of waterfront and demand to restore waterfront. The new community development project in

Nihombashi district that to restore river navigation is set main activities for community development has been started to collaborate with community.

5.1 Sightseeing resources in the community

Main transportation system in Tokyo metropolitan area is subway. The most closet subway stations in Nihombashi district are Nihombashi Station and Mitsukoshi Mae Station. The average numbers of passengers from 2002 to 2006 in the both stations are 19,380,000 passengers in Nihombashi Station and 11,163,000 passengers in Mitsukoshi Mae Station. Total number of passengers in the both stations is approximately 30,543,000 a year.

Table 3. The numbers of subway passengers in Nihombashi district

thousands

Year	Nihombashi Station			Mitsukoshi Mae Station			Total		
	Subtotal	Commuter tickets	tickets	Subtotal	Commuter tickets	tickets	Subtotal	Commuter tickets	tickets
2002	45,565	26,791	18,773	20,098	9,799	10,299	65,663	36,590	29,073
2003	44,226	25,215	19,011	20,453	9,655	10,798	64,679	34,870	29,809
2004	44,166	24,944	19,222	20,981	9,840	11,141	65,147	34,784	30,363
2005	44,744	24,931	19,812	22,066	10,209	11,857	66,809	35,140	31,669
2006	45,256	25,174	20,082	22,266	10,545	11,721	67,522	35,719	31,803
平均	44,791	25,411	**19,380**	21,173	10,010	**11,163**	65,964	35,421	**30,543**

Reference: Tokyo Statistical Yearbook (2002-2006) Tokyo Metropolitan Government/ Bureau of General Affairs

The numbers which show in table 3 are average of incoming and outgoing passengers.

Those statistics show that approximately 6.6 million people visit the district a year. There are more than 30 millions of passengers except commuters. It means that the district has the ability to attract more tourists to the district.

Compared with Asakusa, popular sightseeing points and center of navigation, the number of tourists is 14.5 million other than commuters who hold commuter tickets. The number of tourists is half of Nihombashi district. According to the bulletin report of tourist marketing in Taito, the number of tourists in Asakusa in March of 2007, there are 19.67 million tourists including shoppers and 13.23 millions tourists without shoppers.

The number of passengers of navigation that are counted from the number of Tokyo Cruse Ship CO.,LTD is 2 million passengers that accounts for 10 % of total tourists.

On the other hand, according to overview of tourist survey in Tokyo in 2007, current condition of tourism in Nihombashi district is that ranking of satisfaction was nearly bottom and ratio of visitation was not ranked within the top 20. Therefore, the biggest challenge in Nihombashi is how to develop the sightseeing routes and structures that more 30 million visitors can be touring in Nihombashi district.

Table 4. the number of passengers in Asakusa

Year	Asakusa Station		
	subtotal	Commuter tickets	tikects
2002	24,877	10,760	14,117
2003	24,195	9,980	14,215
2004	24,453	9,648	14,805
2005	24,321	9,510	14,811
2006	24,389	9,388	15,001
average	24,447	9,857	**14,589**

Table 5. Ranking of the most satisfied sightseeing spots in Tokyo by visitors

	subtotal	Sinjuku	Ginza	Sibuya	Odaiba	Marunouchi	Harajuku	Akihabara	Asakusa	Ueno
Subtotal	1405	268	146	97	71	70	63	58	55	44
Europe NorthAmerica Australia	584	103	33	58	9	16	28	27	37	18
Asia	624	116	96	24	58	43	27	25	13	18

	subtotal	Roppongi/ Azabu	Ikebukuro	Aoyama	Akasaka	Shinagawa	Ryogoku	Shiodome	Nihonbashi	The Others	No answer
Subtotal	1405	36	10	6	6	3	3	1	1	6	461
Europe NorthAmerica Australia	584	13	2	1	6	2	2	1	1	0	227
Asia	624	20	6	4	0	1	1	0	0	6	166

Table 6. Ranking of popular sightseeing sites in Tokyo Metropolitan Area

Ranking	Area	Ratio of visitation(%)
1	Shinjuku	25.0
2	Ginza	17.4
3	Shibuya	12.6
4	Asakusa	12.2
5	Yokohama	10.0
6	Other area of Tokyo 23 districts	9.9
7	Roppongi	9.6
8	TDR	8.8
9	Odaiba	8.4
10	Ueno	8.2

One possible way to tourism development in Nihombashi district is to build new dock at the foot of the Nihombashi Bridge and to create a new waterway transportation service line from Aasakusa, Nihombashi, Tsukiji, Shibaura and Haneda. Waterway transportation in Nihombashi district will restore the community.

5.2 Outlines of the project

Table 7 reviews that the numbers that are sorted by types of navigation providers and boats for feasibility of restoring navigation in Nihombashi district. For implementation of operation under regulation is required that two phases of implementation which are non-regular service at Phase 1 and regular service at phase 2 and increasing passengers from 46 thousands to 80 thousands for keeping balance budget in the future. Navigation in Nihombashi district is not only required to operate shipping but also tourism development with community.

Table 7. Preparation for description of navigation in Nihombashi district

Section	Description
Phase 1 Non-regular service for charter and events	【operational service】 to obtain boats, to develop operational planning, and to start non-regular service 【building docks】 equipment planning for boats followed with specifications, designing, accessible 【dock management】 operation and maintenance of docks associated with community gusts accommodation determination for the administrator, managerial approach and operational expense
Phase 2 Regular service and non-regular service	【operation】 obtaining boats, financial planning, regular operation 【dock management】 operation and maintenance of docks associated with community gusts accommodation budgeting and maintenance

6 CONCLUSION

Chiyoda City, Minato City and Chuo City is the central area of Tokyo, used to called “Edo”. The municipalities above have already developed some districts which are already to be introduced to the world, such as Akihabara in Chiyoda City, Roppongi in Minato City and Ginza in Chuo City. The Nihombashi district has treasure of tradition and culture nurtured during the Edo period. However, it has not been fully utilized yet. Since the time the “Nihombashi River Sky View Restoration Committee” submitted a proposal, the local community has begun taking an initiative to consider the future plans for the Nihombashi district. The key words of the city planning are “history”, “culture” and “waterfront”. As we take great care of the materials to reserve, to create and to restore, we intend to propose further ideas with the aim to create cities with “dignity” to the world and “prosperity” from the social, economic and environmental points of view. Essential part of implementing community development in Nihombashi district is tourism development which restoring river navigation in Nihombashi River takes important roles. As the first step, constructing bridge is necessary to restore navigation in Nihombashi district..

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