

# Construction Economy Report

No. 47

## The Japanese Economy and Public Investment

The Construction Industry Coping with Changes and  
Exploring Possibilities for New Directions

October 2006

Research Institute of Construction and Economy

(RICE)

Tokyo, JAPAN

This is an English translation of a summarized report in Japanese,  
announced in October 2006

# CONTENTS

<b>Chapter 1</b>	<b>Macroeconomics and Construction Investment</b>	<b>1</b>
	[Original Japanese Version: p.1–32]	
1.1	Trends in the Japanese economy and construction investment	
1.2	Social infrastructure improvement in an aging society with fewer children	
<b>Chapter 2</b>	<b>The Construction Industry</b>	<b>4</b>
	[Original Japanese Version: p.33–115]	
2.1	Industrial structure and productivity of the construction industry	
2.2	Due diligence by construction companies	
2.3	Development of CAD technology and the reform of construction production systems	
2.4	The effect of new Company Act on the construction industry	
2.5	More efficient procurement of construction companies	
<b>Chapter 3</b>	<b>Urban and Housing Issues</b>	<b>15</b>
	[Original Japanese Version: p.116–137]	
3.1	The role of culture in urban and regional renaissance	
<b>Chapter 4</b>	<b>Overseas Trends</b>	<b>17</b>
	[Original Japanese Version: p.138–187]	
4.1	Trends in overseas construction markets	
4.2	The U.K. construction industry and the London Olympic Games	
4.3	International comparison: methods of calculating public fixed-capital formation	

For further information please contact:  
Takayasu Matsuura (Executive Director)  
Hiroshi Ohshima (Executive Fellow)  
Hiroki Kawata (Senior Researcher)  
e-mail: info@rice.or.jp

## Chapter 1 Macroeconomics and Construction Investment

### 1.1 Trends in the Japanese economy and construction investment

- Export growth, supported by steady economic growth abroad, is contributing to increases in corporate profits. This has resulted in stronger business confidence and increased investment in plant and equipment. Higher employment has a positive effect on consumer confidence. Consumer spending is gradually increasing. Steady growth of the Japanese economy is expected for FY2007, though the pace may decelerate due to the slowdown in economies abroad.
- Construction investment posted the first year-on-year increase in nine years in FY2005; however, investment in FY2006 is expected to be smaller due to shrinking public-sector construction investment.
- Both private-sector non-housing and housing construction investments are likely to increase, reflecting the recovery of the Japanese economy.

### Trends in construction investment (Nominal, FY)

	Actual			Tentative			Forecast			
FY	1990	1995	2000	2001	2002	2003	2004	2005	2006	2007
Nominal CI	81,440	79,017	66,195	61,288	56,840	53,700	52,530	53,460	52,800	51,870
(Increase rate)	11.4%	0.3%	-3.4%	-7.4%	-7.3%	-5.5%	-2.2%	1.8%	-1.2%	-1.8%
Nominal government CI	25,748	35,199	29,960	28,193	25,917	25,914	20,520	19,880	18,030	16,270
(Increase rate)	6.0%	5.8%	-6.2%	-5.9%	8.1%	-9.4%	-12.6%	-3.1%	-9.3%	-9.8%
(Contribution rate)	2.0	2.5	-2.9	-3.3	-3.7	-4.3	-5.5	-1.2	-3.5	-3.3
Nominal private CI	25,722	24,313	20,276	18,575	17,951	17,900	18,370	18,600	19,090	19,420
(Increase rate)	9.3%	-5.2%	-2.2%	-8.4%	-3.4%	-0.3%	2.6%	1.3%	2.6%	1.7%
(Contribution rate)	3.0	-1.7	-0.7	-2.6	-1.0	-0.1	0.97	0.4	0.9	0.6
Nominal private NH CI	29,970	19,505	15,959	14,519	12,972	12,340	13,630	14,980	15,680	16,180
(Increase rate)	18.4%	-1.8%	0.7%	-9.0%	-10.7%	-4.9%	10.5%	9.9%	4.7%	3.2%
(Contribution rate)	6.4	-0.4	0.2	-2.2	-2.5	-1.1	2.4	2.6	1.3	0.9
Real CI	84,044	77,727	66,195	62,358	58,405	54,832	53,030	53,360	52,010	50,580
(Increase rate)	7.6%	0.2%	-3.6%	-5.8%	-6.8%	-6.1%	-3.3%	0.6%	-2.5%	-2.7%

(Units: billion yen. Real figures are based on 2000 prices.)

Notes:

1. CI: construction investment NH: non-housing
2. Private NH CI = private non-housing construction investment + private civil engineering investment.
3. Data from the "FY2006 Construction Investment Outlook" by MLIT up to FY2005

## **1.2 Social infrastructure improvement in an aging society with fewer children an approach from the perspective of growth accounting**

- The rapid aging of the population due to the decline in the birthrate will place stricter limitations on the growth of the economy. To maintain an affluent and stable society, we should maximize the productivity of capital stock, labor and TFP (total factor productivity). TFP trends have a great impact on economic growth. Maximizing TFP has been at the top of the political agenda in recent years.
- We believe that improving social infrastructure increases the possibility of growth, in addition to bringing about the primary benefits of public investment. More studies on the role of social infrastructure in sustaining economic growth and on effective methods of investment, including public-private partnership, should be conducted.

- **The impact of the declining birthrate and the aging of society**

The expected impacts of fewer children and more senior citizens on the Japanese economy include; a) economic contraction and, b) lower savings rates. Stable economic growth under such circumstances requires more involvement of senior citizens, women and youth in the labor force, and higher per capita labor productivity (per capita GDP).

- **Economic growth and trends in fiscal and financial policies**

The government has placed a priority on strengthening growth and competitive powers through increased productivity in its economic growth strategies (e.g., *Japan's 21st Century Vision*, and *Basic Policies for Economic and Fiscal Management and Structural Reform* and the so-called "Large-Boned Policy"). Fiscal policies by banking authorities are in line with the government's financial policies, with many approaches aimed at achieving sustainable economic growth.

- **Social infrastructure improvement as the driving force of economic growth**

To alleviate the effects of the medium- to long-term decline in the labor supply due to the aging of society and the declining birthrate, potential labor supplies, including women and senior citizens have to be utilized. Improved social infrastructure will play a greater role in achieving this objective. Examples include: a) daycare centers to enable women to work while raising children, b) planning of compact cities with a balance between work, personal life and shorter commuting times, c) urban redevelopment projects meeting the new needs of citizens, and d)

more convenient and easy-to-use means of transportation.

- **Social infrastructure improvement and its related systems are considered to have a great impact on the sustainable growth of the economy, although it is still difficult to measure their direct impact on TFP and some cannot be classified into existing patterns and frameworks of growth accounting. Examples include:**
  - **Urban environment that can attract value-added and labor-intensive industries that can bring vitality to cities**
  - **Use of private-sector vitality through public-private partnership**
  - **Increase economic value from the perspective of a life cycle (e.g., renewal and conversion)**
  - **Maintenance and renewal of social infrastructure that can contribute to international competitiveness and other objectives**
  - **Tax systems that do not hamper private-sector new investment and facility renewal**

## Chapter 2 The Construction Industry

### 2.1 Industrial structure and productivity of the construction industry

- Based on the *Financial Statements Statistics of Corporations by Industry* and the *Establishment and Enterprise Census*, it is estimated that there are about 700 to 800 thousand construction companies (including non-incorporated businesses) in Japan. The number of construction workers increased when the amount of construction investment, chiefly public-sector investment, rose following the bursting of the economic bubble. These workers were mostly employed by private-sector construction companies whose numbers also increased during the post-bubble period.
- The construction industry is “aging” at a faster rate than other industries. The skills and expertise must be passed on to the younger generation of workers. The major players in this challenge are the Construction Masters 5,203 people were awarded this title between FY1992 and FY2006.
- The nominal labor productivity of the construction industry has declined, from about 90% of manufacturing industry in the early 1990s to about 60% in 2004.

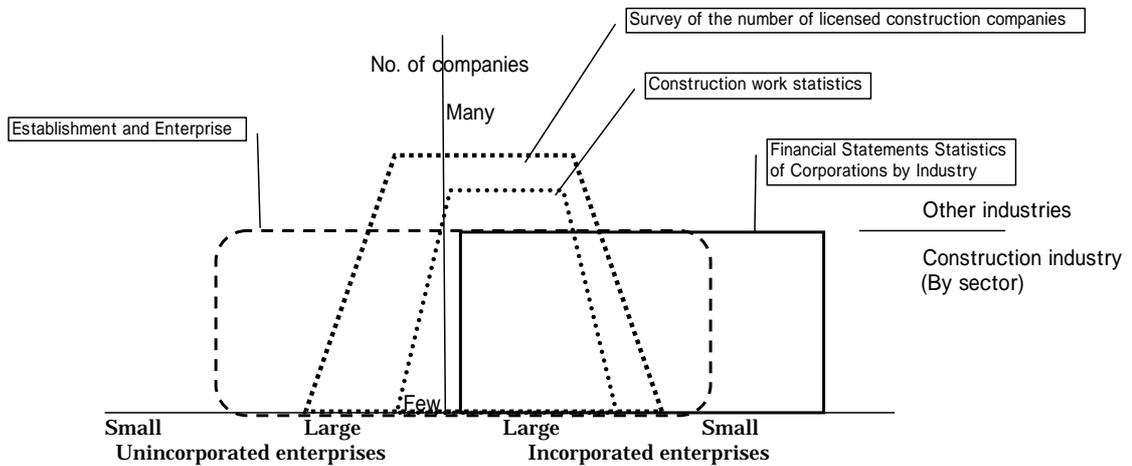
#### ● Structure of the construction industry

- There are several data sources that can be used to estimate the number of construction companies (see the chart).
- The numbers of both incorporated and unincorporated construction enterprises have fallen in recent years. The decrease rate is greater for the latter. The number of construction workers peaked in 1996 and decreased in most sectors except for the remodeling trade (the number of workers increased from 2001 to 2004). While general contractors are losing their market share, subcontractors engaged in utility work and specific work assignments are gaining ground.

#### ● Productivity of the construction industry

- The nominal labor productivity of the construction industry has become lower than that of the manufacturing industry. This is because production output in the construction industry has decreased at a faster pace than that of the manufacturing sector, while the number of workers has declined at a slower rate.
- Characteristics of the construction industry that can impact the industry's productivity are: a) labor-intensiveness, b) outdoor, unit-based production (difficult to mass-produce) and c) multi-layered subcontracting system.

**Distribution of enterprises and companies in various data used to estimate the number of construction companies (conceptual chart)**

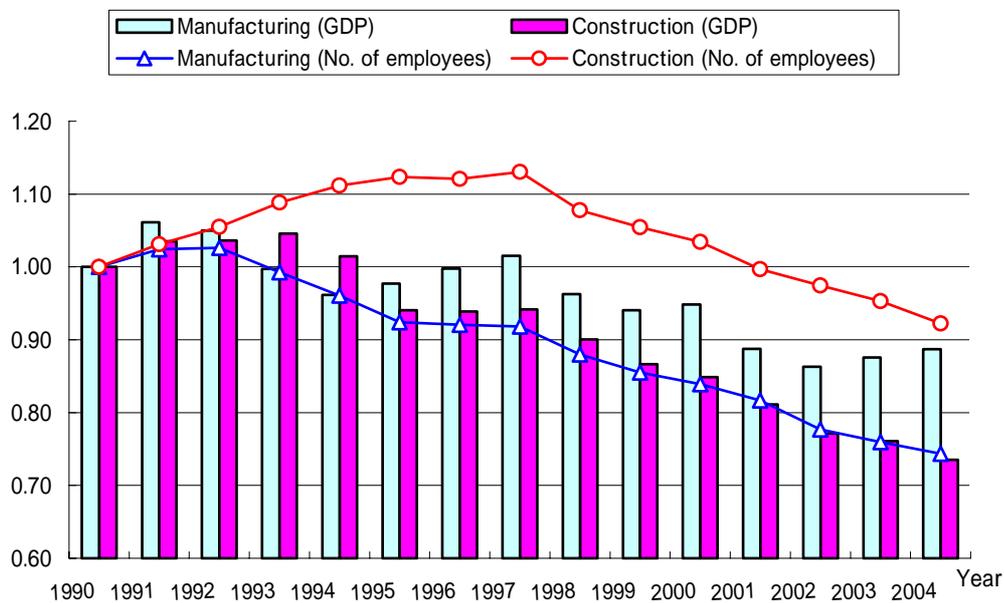


**The number of construction companies by data sources (FY2004)**

	Total	Private enterprise	Incorporated enterprise
Financial Statements Statistics of Corporations by Industry (Ministry of Finance)			<b>*487,061</b>
Corporation Sample Survey (National Tax Agency)			438,086
Establishment and Enterprise Census (Ministry of Internal Affairs and Communications)	507,740	<b>*223,621</b>	284,119
Survey of the number of licensed construction companies (Ministry of Land, Infrastructure and Transport)	558,857	132,675	426,182
Construction Work Survey (Ministry of Land, Infrastructure and Transport)	273,517	54,739	218,778

**\*Total about 700-800 thousand**

**Trends in the production output and the number of employees:  
Construction and manufacturing industries**



**Note: Based on data from the Annual Report on National Accounts**

## 2.2 Due diligence by construction companies

- Construction companies are performing more due diligence due to the growing popularity of real estate securitization, growing concerns over risks associated with owning real estate, and more emphasis on its profitability.
- Construction companies can utilize their experience and expertise in the examination of structures and buildings to prepare due diligence reports.
- Due diligence will become more important due to: a) growing uses of so-called "development-type securitization" and more use of due diligence for civil engineering projects, together with greater information disclosure in real estate transactions.
- Due diligence is a promising fee-earning business for construction companies. They are expected to better utilize their personnel and increase the design skills of both new construction and remodeling.

### ● An example of a due diligence checklist

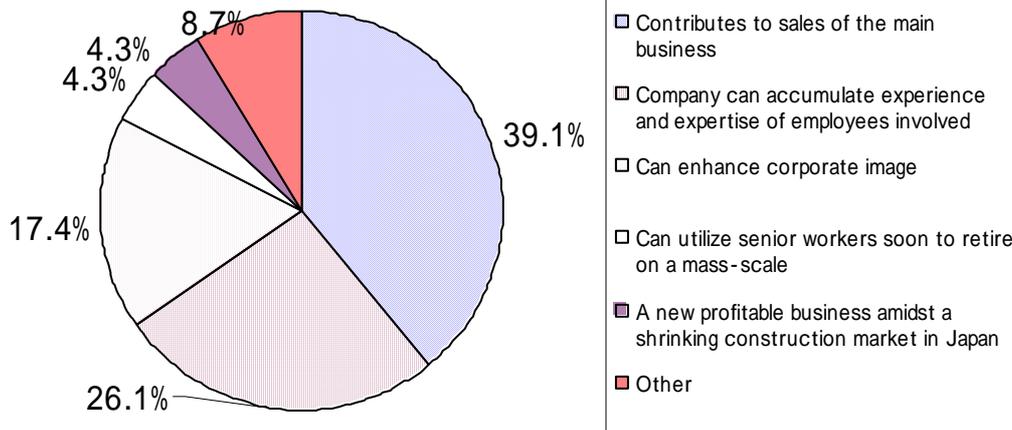
XXX Building

Place	Lot number	x-x-x, <town name>, <city name>, <prefecture>	
	Address	x-x-x, <town name>, <city name>, <prefecture>	
Date completed	July 31, 1976	Uses	Office/store/garage/machine room
Structure	Flat-roofed reinforced concrete building (nine stories plus two-storied basement )		
Site area	1,319.15 square meters	Floor area	11,950.37 square meters
Building-to-land ratio	100%	Floor-area ratio	900%
Purchased price	1,930 million yen		
<Special notes>			
<ul style="list-style-type: none"> <li>• Asbestos has been spraying on some parts of the building, including the machine room. Based on a building condition assessment report compiled by the XXX Construction Company on November 28, 2002 these parts are well maintained and have no impact on the environment.</li> <li>• This building was designed and built based on the old Building Standard Law (and old quake-resistance standards). In November 2004 a seismic retrofit plan for the building was approved based on a law to promote seismic retrofit of buildings. The retrofiting was conducted in July 2005.</li> </ul>			

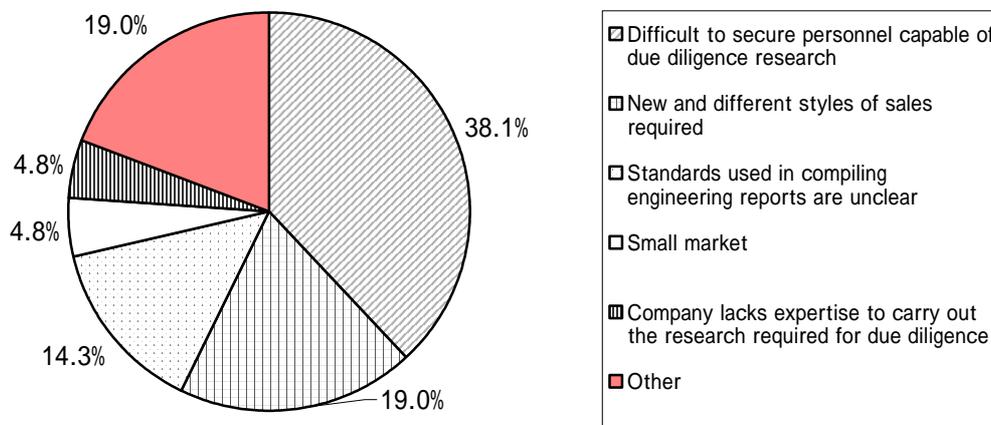
● **Advantages of and issues concerning of due diligence**

(Multiple answers allowed; Figures are the percentage of the total number of answers)

**Advantages**



**Issues**



Data from RICE.

Based on a questionnaire survey conducted by RICE, two-thirds of the responding companies stated that they expected the advantages of conducting due diligence work to be “contributes to sales activities of the main business” or “can accumulate experience and expertise of employees involved.” “Difficult to secure personnel conducting the due diligence research” and “new and different styles of sales required” were mentioned as two major challenges in conducting due diligence.

### **2.3 Development of CAD technology and the reform of construction production systems**

- Computer-aided design (CAD) has developed from two-dimensional systems to object CAD, and further, to the new-generation multi-dimensional CAD with smooth information flow and linkage.
- The latest CAD technology provides good communication infrastructure. Production processes can be integrated, concurrent work processes and collaboration among technical staff can be facilitated, and construction production system can be switched from isolated sections to collaborative network-based ones.
- Construction companies of many countries are ahead of their Japanese counterparts in introducing new-generation CAD technology. Within Japan this technology is being experimented with in bridge and building construction.

- **Development of the new generation of CAD technology**
  - CAD technology has advanced from being two-dimensional(dealing with geometric objects like lines and curves) to being able to combine three-dimensional parts and components by defining sizes, material, mass and other detailed attributes to design buildings and prepare component drawings.
- **The effects of the new generation of CAD technology**
  - The new generation of CAD technology helps people to understand the shape of three-dimensional objects. All parties involved in the project can examine the configuration of components, construction processes, estimates and maintenance and repair methods using a single model, and can share the same information. This eases communication and promotes collaboration.
  - A builder's knowledge and expertise can be reflected to the design process from its early stage, and can thus increase the quality of design documents, save time required for estimation and working diagram preparation, offer more precise and accurate working diagram to the site, and can reduce adjustment time needed after construction starts.
  - By simulating the process using a three-dimensional model, it becomes easier to have a clearer image of what should be done, the timeline, and how much building material is required making distribution and procurement better managed.
  - The client's design and construction data can be supplied to the building manager as three-dimensional model information, which can be utilized to make maintenance more accurate and efficient.

- **Reforming the construction production system**
  - The more efficient sharing of information among the parties involved in a construction project can integrate the construction production system. The conventional production system, based on the division of labor (isolated sections), can be changed to a collaborative network through concurrent business and collaboration among staff.
  - Three-dimensional information models created by new CAD technology can be shared among the client, the contractor, the building manager and others involved in the project. Transparency and trust can thus be achieved.
- **Use of the new generation of CAD technology**
  - Research and experimentation using the new technology has begun in bridge and building construction, but is still in the early stages in civil engineering. There are various problems to be addressed to apply the technology.

#### 2.4 The effect of new Company Act on the construction industry

- The new *Kaisha-ho* or “Company Act” came into effect on May 1, 2006. Under the new Act, the minimum capital requirement and the Limited Company Law were abolished. Corporate bodies can more flexibly be designed. New rules governing mergers, and other corporate restructuring and internal control systems were established. The new Act has a great impact on both large and smaller companies. Many construction companies are studying the Act closely.
- The Act has removed restrictions on bond issuance by offering more diversified financial procurement methods to companies. It is expected that major construction companies in particular will utilize various financing options and invigorate their businesses.
- Smaller companies can utilize the new system of the *Godo Gaisha* (Limited Liability Company) to exploit new business fields and create new business opportunities.

- **Elimination of the minimum capital system**

- The removal of this system is expected to encourage entrepreneurs. Since the construction industry is mature, the impact of the change is expected to be small in the short term. Nevertheless, a long-term effect may be coupled with changing industrial structure.

#### Number of enterprises in each corporate sector of the construction industry (FY2004)

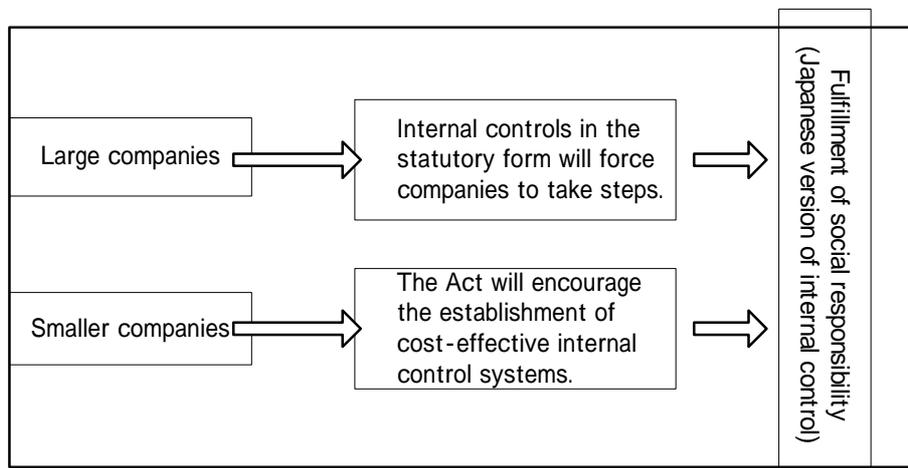
	Total	Unincorporated (% of total)	Incorporated			
			Total	Corporations	Limited companies (% of total)	Other
All industries	4,347,764	2,818,148 (64.8%)	1,529,616	693,683	815,145 (18.7%)	20,788
Construction	507,405	223,621 (44.1%)	283,784	131,010	151,654 (29.9%)	1,120

- **Internal control systems**

- Under the new Act, major companies are required to establish basic policies governing their internal control systems. Though not mandatory, it is expected that pressure on smaller companies from their clients to establish some form of internal control system will increase.

- **Challenges for the construction industry following the enforcement of the New Company Act**
  - Major construction companies should enhance transparency through the auditing functions stipulated in the new Act and other means to meet public expectations for improved compliance and corporate governance.
  - Smaller construction companies should aim to achieve healthier corporate management by exploiting new business fields through the *Godo Gaisha* (Limited Liability Company) framework. They should set up better methods of information and present more accurate financial documents by utilizing accounting advisors.

**Economic effect of stronger internal controls by the new Company Act**



## **2.5 More efficient procurement of construction companies**

- Timely and smooth communications throughout the supply chain of construction materials is needed to increase productivity and reduce costs. Little progress has been made in this regard especially among smaller general contractors.
- Procurement problems affect: a) commercial and physical distribution, b) procurers (clients) and major general contractors, and c) smaller general contractors.
- Joint procurement may be an effective way to address the problems faced by smaller general contractors.

### ● **Procurement challenges**

- Traditionally, construction materials have been procured via commercial and physical distribution routes that are basically the same. This situation has changed. Direct procurement from the manufacturer to the construction site without using a trading company or taking different routes depending on the type of procurement (whether processing is needed or not) is becoming common.
- Nevertheless, procurement is facing the following challenges: a) inefficient physical distribution due to complicated distribution channels in the involvement of trading companies, coupled with inadequate supply arrangement by general contractors; b) procurers and the general contractors lagging behind in the use of information technology, with the procurement information not adequately distributed among the related parties; and c) smaller companies unable to take advantage of scale.

### ● **Methods for more efficient procurement**

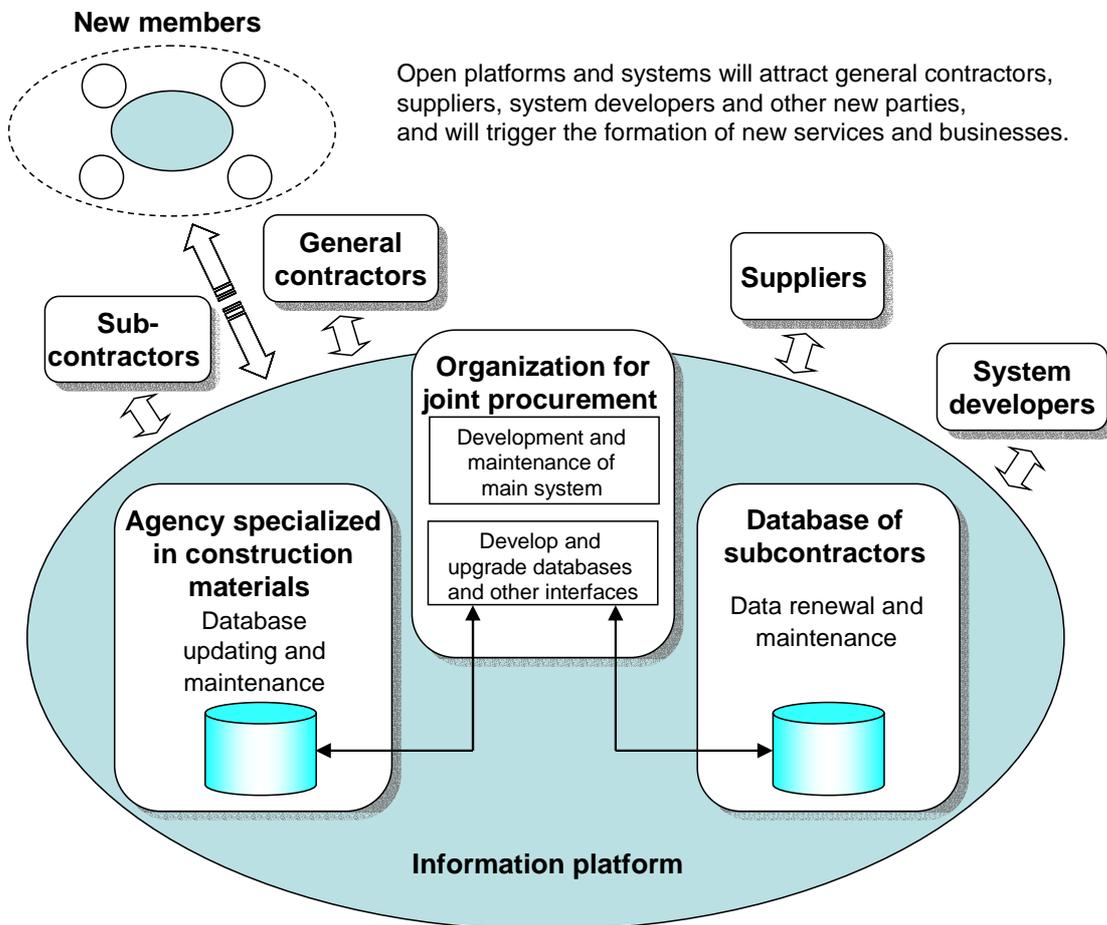
- The supply chain should be rationalized. The “pull system,” i.e., production based on a demand forecast, should be adopted to make construction procurement more efficient.
- Approaches include: a) rationalizing the commercial distribution channels and have the general contractors and material suppliers cooperate to rationalize the physical distribution channel as a whole; b) having procurers and general contractors select the design and specifications at an early stage and share information utilizing IT; and c) enabling joint procurement by smaller general contractors.

### ● **Joint procurement of construction material**

- Some smaller general contractors and material suppliers have formed

cooperatives and have successfully reduced their procurement costs by 10 to 30 percent.

- Joint procurement is a win-win solution for those involved in procurement. It enables: a) low-cost purchases taking advantage of scale economies; b) standardized and digitalized procurement procedures; c) faster procurement; and d) reduced waste of personnel and other management resources.
- The following need to be established: a) an information platform to share and offer information on the construction material, and a system to guarantee the payment by the procurer. These changes will require strong leadership by the manager in charge, and cooperation among the member companies.



## Chapter 3 Urban and Housing Issues

### 3.1 The role of culture in urban and regional renaissance

- A big challenge for municipalities is to combine facility development (the “hardware”) and service policies (the “software”) to bring boost local populations and increase the number of local jobs.
- City planning focused on culture can recreate a sense of local identity, facilitate collaboration through area management, and launch policies that can stimulate citizens to involve themselves in their communities. This can encourage future development of the region (Successful examples; Lille and Nantes).

- **The role of culture in urban/regional renaissance**
  - Culture has a new and important role in community/city planning. Culture as social capital can encourage collaboration among citizens. A small amount of investment in culture can harness the creative power of citizens, can contribute to increased TFP (total factor productivity) and can enhance the image of the community or the city.
- **Example of Lille**
  - The city of Lille in northern France once flourished as a manufacturing center. After the decline of these industries in the 1970s the city challenged to revive the city through renewal of cultural assets and the Euralille ultramodern urban remodeling project. The city was elected European Capital of Culture in 2004 by the European Union. During this City of Culture year the city held many cultural and artistic events.
- **Example of Nantes**
  - This city of Nantes in northwestern France declined in the 1970s when the harbor was relocated to Saint-Nazaire. The city successfully reinvented itself through the *Ile de Nantes* project, utilizing industrial assets, including former shipyards and by remodeling a former biscuit factory to create a cultural facility (*Le Lieu Unique*) and by holding a classical music festival *La Folle Journee*.
- **Culture-based urban and regional renaissance: Its direction**

In order to revive the city or region by utilizing culture and set out the route map to

**its future development issues including the followings should be considered:**

- **Discovery and assessment of quality regional resource of culture and rediscovery of regional identity**
- **Collaboration among the people and parties concerned through area management**
- **Launch policies and methods to empower the “soft power”**
- **Political leadership and the public sector role**
- **Establish a system of citizens participation**

## Chapter 4 Overseas Trends

### 4.1 Trends in overseas construction markets

- The view that U.S. economic growth will gradually slow is gaining popularity. The Federal Fund (FF) rate remains at 5.25% after it was raised in late June and inflation worries, fueled by crude oil price hike and other factors, may be easing. One of the factors of the economic slowdown is the sluggish housing market. The possibility of a soft landing for the fast-growing U.S. economy is stronger.
- The United States is expected to spend a total of 1,217.2 billion dollars on construction investment in 2006, the largest sum in history. Its expected growth rate over the previous year, however, is 6.8% much lower than the previous two years of double-digit growth. The expected annual growth of 9.7% in public investment may be dampened by sluggish private-sector housing investments, whose annual increase rate is expected at -0.1%.
- European economies are gradually recovering. GDP growth rates of Western European countries are lower than those of central and Eastern European countries, as their markets have matured.
- Of the five major western European states, namely the United Kingdom, France, Germany, Italy, and Spain, it is forecasted that the U.K. will record a high GDP and construction investment rates between 2006 and 2008, compared with other “mature” markets. This may be partly due to the London Olympic Games scheduled for 2012.
- Both GDP and construction investment are growing in Asian and Oceanian countries even though prices of crude oil and materials are increasing, particularly in China. However, statistical figures are often revised in China, giving rise to doubts about the credibility of these figures and concerns over overinvestment.
- Among industrialized nations, Australia is growing relatively fast. Every year over 1% of the population is immigrating to the country. To meet their needs, active public investment through Public-Private Partnership (PPP) method has been conducted.

#### **4.2 The U.K. construction industry and the London Olympic Games**

- In the U.K. the amount of public investment slumped from the 1970s to 1990s. It started to increase again since the turn of the century. The construction industry is now buoyant, partly due to demand relating to the London Olympic Games of 2012. An analysis of major construction companies, however, sheds light on problems facing the U.K. construction industry.
- The Private Finance Initiative (PFI) is a common method of construction of hospitals and other infrastructure in the U.K. Major construction companies are the PFI service providers in their respective realms of expertise.
- Time has passed since the concept of “Partnering” was first proposed in the construction industry. This concept is far from being prevalent.
- “Partnering,” on the other hand, has been introduced in placing orders of public works projects. This method is likely to be used for contracts with companies in charge of the construction management (CM) of Olympic Games construction projects. In the screening process a competitive dialogue procedure (a type of a comprehensive evaluation system) was used.
- Because of sluggish public investment in the U.K. the number of suitable subcontractors decreased in the 1990s. There may be great expectations for Japanese construction companies to meet the demands created by the Olympic Games.

#### **4.3 International comparison: methods of calculating public fixed-capital formation**

- RICE compared four countries (the U.S., U.K., France and Germany) in terms of how they calculate public fixed-capital formation in the national accounts (government fixed capital formation including public companies).
- The National Income & Product Accounts (NIPA's) of the U.S. are different from SNA93 (System of National Accounts 1993) employed by Japan as follows. Firstly, it has two broad categories: individuals and government & business. Government is further divided into "General government" and "Government enterprises." Secondly, weapons for national defense, if used for a period of one year or more for production purposes, are included in the gross fixed-capital formation. Thirdly, trees, livestock and artistic works are not included in gross fixed-capital formation. The concept of public fixed-capital formation in ESA95 (European System of Accounts) applied by three European countries, and SNA93 are the same.
- In all countries, many organizations involved in social infrastructure improvement are included as public companies (government projects). Therefore it is difficult to compare the level of public investment solely by general government spending (government in a narrow sense without public corporations included). In addition, there are several issues. For example, in the U.K., public financial institutions are included in public non-financial corporations for statistical purposes. In France and Germany, the breakdown of corporations, whether public or private, is not announced.
- Other factors, including delays in developing statistical methods to analyze public-private partnership and other new social infrastructure improvement methods and the difficulty of taking differences in land and climactic conditions into account make international comparison of public investment standards difficult.