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Think Together about the Relocation of the National Diet and Related Organizations

Environment

How national land-use should be structured to achieve a Low-Carbon Society: A City Planning Perspective

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1. The Ideal Way to Structure National Land-use for a Low-Carbon Society

When we think about the ideal way of structuring national land-use for a low-carbon society, we have to get back to urban morphology, the foundation of urban design. This is because efficient urban activities can be conducted only in an ideally structured urban space, which is also an objective we try to achieve in a low-carbon society.

The ideal spherical urban structure has been discussed for more than half a century. Fig.1 shows one of the structure models suggested by Dr.Hideaki Ishikawa (1893-1955). In this model, people live their everyday lives within a small city sphere about 5 km in radius. Daily mobility needs for commuting and shopping are satisfied with short transfers on foot, by bicycle or bus. People go out to a mid-sized mother city (population 100,000 - 200,000 and about 15 km in radius) for weekend shopping and leisure. Meanwhile, once or twice a month people travel to a large city (metropolis) via inter-city railroad to visit galleries or enjoy shopping at specialty stores.

If hierarchical city spheres like the ones above are positioned without overlapping each other, cities could be optimally allocated across the entire nation, thus minimizing the total transfer distance of the people who live there.

Now let's look at the projected environmental impact of traffic in a new city, based on the assumption that the ideal spherical structure has been realized and capital functions are relocated. When a new city with a population of 100,000 is formed as shown in the diagram on the left of Fig.2, per-capita CO_2 emissions in the traffic sector are estimated at 608 g based on the projection that 50.5% of mobility in the new city will be by walking and cycling.

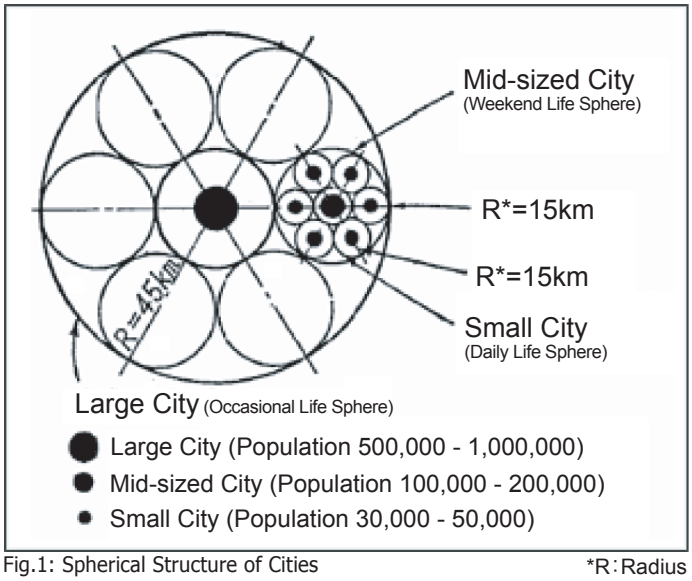
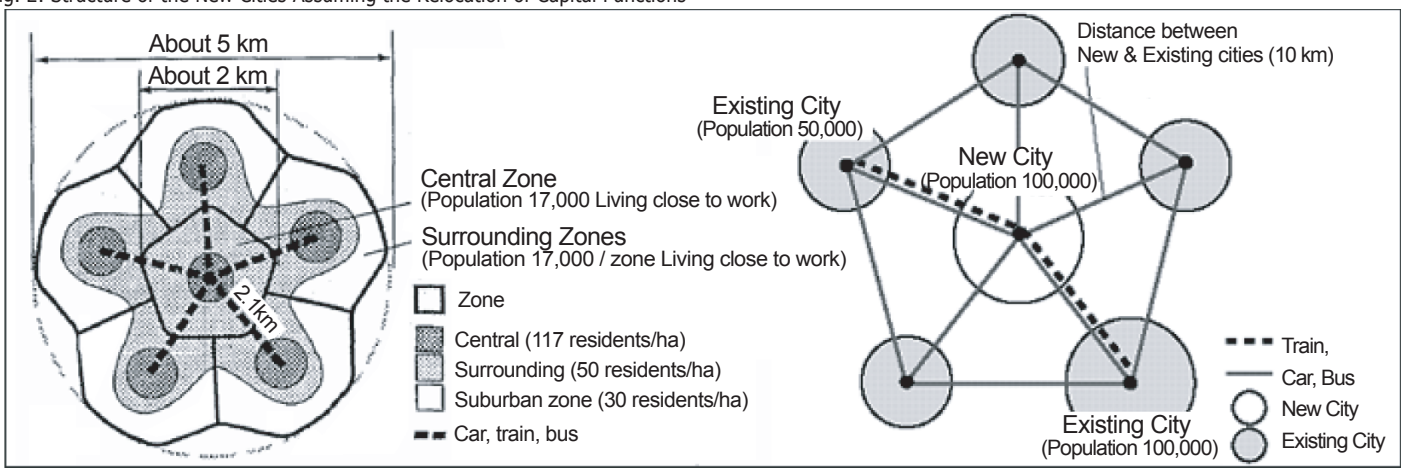


Fig.1: Spherical Structure of Cities *R:Radius

In contrast, CO_2 output per capita will increase to 1,092 g in the greater city area that includes existing cities (diagram on the right, Fig.2). This is because of higher dependency on automobiles in the existing cities. The nation's average CO_2 emissions from automobiles were estimated at 2,274 g/person in 2005. By building ideal new cities, it would be possible to reduce CO_2 emissions to less than half of those in existing cities, although a hypothetical comparison may not be appropriate.

Fig. 2: Structure of the New Cities Assuming the Relocation of Capital Functions



Reference: Papers on City Planning Institute of Japan by Yamamoto, Morimoto, Morita and Saishu (2001)

2. National Land-use to Achieve a Low-Carbon Society

Due to facts such as geographical restrictions and varied formative histories, cities in Japan are not necessarily structured ideally. However, discussion about urban formation and simulation of virtual cities offers us some clues about the optimal form of national land-use. Through discussing and simulating, we found that hierarchical zoning of living spheres may contribute to more efficient utilization of national land. To be more specific, "Shifting to a hierarchical zoning structure" is one recommended approach. Two key factors of the above approach are "Dispersing highly sophisticated city functions" and "Unifying daily living spheres in urban regions."

(1) Networking New Cities

To enhance linkage and complement mutual functions, new cities should be inter-connected with high-standard arterial highways, high-speed public transit (like the Shinkansen) and high-speed communication networks. Smoother transfer of people and commodities would help avoid excessive concentration of urban functions while making the country more disaster-resistant.

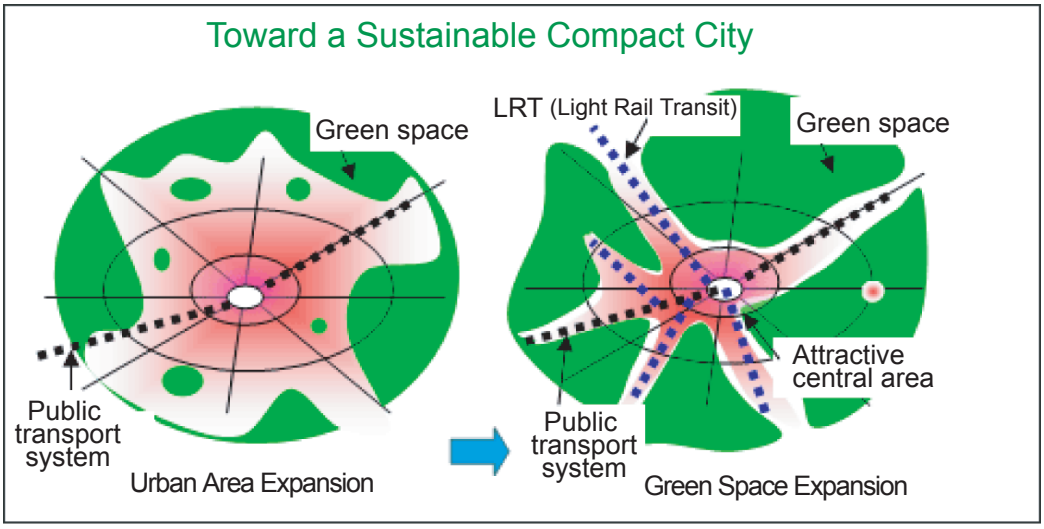
(2) New Cities as Self-sufficient Living Spheres

To reduce environmental loads of urban traffic, one realistic solution is to cut down the total transfer distance within the living sphere by promoting the use of non-motorized mobility means such as walking and cycling. To that end, existing cities that expanded with heavy dependence on motor vehicles have to be restructured by prioritizing the human scale concept. Introduction of the Compact City[*1] Policy, attracting attention mainly in Europe as a sustainable urban model, is a key approach toward the new city. In recent years, several local governments, including Aomori City and Toyama City, have adopted the Compact City concept in their urban policies.

Note 1: Compact City

A structural model that enhances sustainability. With a relatively smaller daily living area in the form of a central zone where people can move around without motorized vehicles, essential functions for city living are consolidated in high/medium density. The model lowers infrastructure costs and reduces the environmental impact of traffic.

Fig. 3: Smart Shrink Policy toward a Sustainable Compact City



3. Residential Types in Low-Carbon Cities

Two primary residential types will be available in low-carbon cities. One is to live in an inner city apartment/residence, as shown in Fig.4, close to work and without driving. One can enjoy inner city life with rich and varied conveniences, vibrant air and bustling streets. One who lives in the suburban area alongside the next-generation LRT connecting the inner city and suburban centers can also enjoy a similar lifestyle. Life without driving contributes a great deal to reducing the CO_2 emission per capita.

Another option is a return-to-nature kind of living. Comfortable living spaces will be made when the Smart Shrink Policy[*2] helps to restore suburban green spaces and their quiet natural environment. Residents will be able to raise children in a relaxing atmosphere while enjoying growing vegetables and flowers. Eco-friendly means of transport, such as bicycles and small EVs, will be predominant. Next-generation medium-speed personal transportation like Segway may also be an option.

What's important is offering more options in choosing residential types. Although the Compact City is widely accepted as an ideal urban model, we still have a long way to go before realizing it. This is partly because the residential relocation mechanism doesn't work as smoothly as desired. Nobody can be forced to move into a highly populated city area. To this end, it is vital to raise the quality of life of urban residents through offering more living options that suit individual lifestyles.

Note 2: Smart Shrink Policy

An urban policy to make suburban areas shrink while maintaining a certain level of city service functions. To avoid desolation of suburban areas from population outflow, the policy recommends converting the use of idle land to tree-planting zones, community farmland and suburban residential districts.

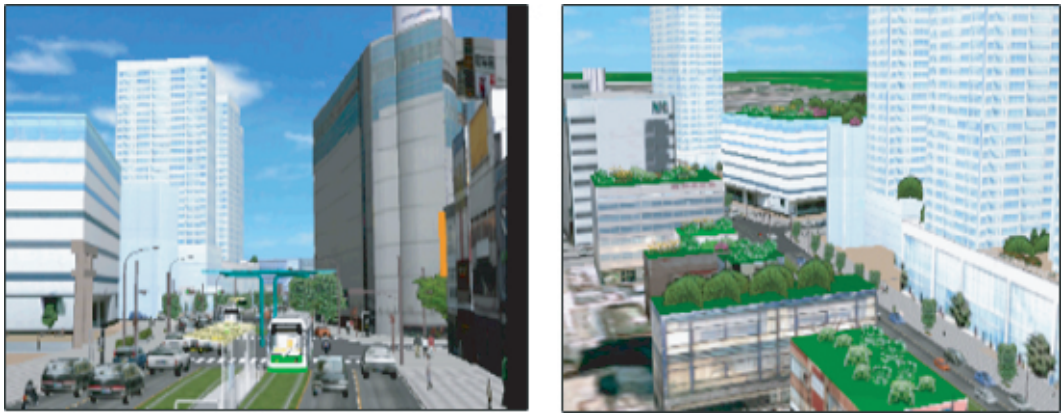


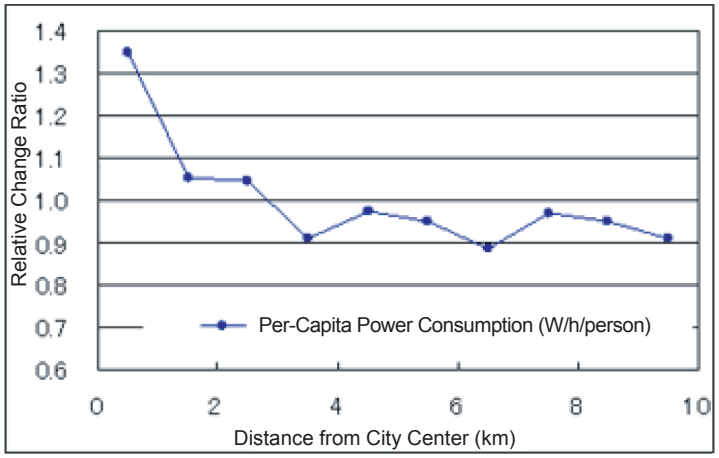
Fig. 4: Image of Transit Space in a Major Local City

4. Lifestyles in Low-Carbon Cities

It is also important to establish a lifestyle that is suitable in a low-carbon city. If a person drives frequently to large suburban shopping facilities while living in the inner city with excellent accessibility, his/her lifestyle can hardly be considered good in a low-carbon society. What's essential for realizing a low-carbon society is that people get used to the new lifestyle and conform to the changes of urban functions and facilities. It is said that public transportation is more eco-friendly, but that's not to say that buses and trains are more environment-oriented than other motor vehicles. Sharing of a space by many passengers makes it possible to cut down per-capita mobility energy, which helps reduce overall environmental loads. If only two or three passengers are on a large bus, it is obvious the bus is less efficient than a passenger car in terms of energy efficiency. In short, sharing spaces is one primary prerequisite for realizing a low-carbon society.

As for household energy use, per-capita power consumption can be kept lower if family members stay in a single living room. The same can be applied to a Compact City. For instance, as a result of promoting residential relocation of single people to inner cities, the number of single households and appliances will increase, and this will eventually cause a rise in power consumption. Fig.5 shows per-capita power consumption in a major urban area.

Fig. 5: Changes of Per-Capita Power Consumption relative to Distance from City Center (Variation where overall average is 1.0)



Reference: Infrastructure Planning Review by Imamura, Morimoto, Furuike and Nakai (2004)

The graph demonstrates that the closer to the heart of the city one lives, the more power one consumes. Suburban households tend to have more residents; thus, their per-capita power consumption is less than that of urban residents. Thorough understanding of the lifestyles of residents in low-carbon cities is essential for making appropriate urban policies.

5. Conclusion

In the course of realizing low-carbon cities, a long-term vision is required. Once people's changing values force the transition to a low-carbon society, new types of urban activities will emerge, which by necessity will bring about a new traffic demand. That new traffic demand will call on new transportation facilities that satisfy the demand. In this way, the needs of the age will encourage the birth of next-generation transport.

Then, changes in land use will become obvious over the years and city structures will change gradually. Beyond these changes, we will see low-carbon cities.

When attempting to realize low-carbon cities in terms of urban design, land-use and transport strategies must be made in chronological order, because land use and transport interact with each other and have mutual impact via time-line. To build a next-generation new city that can serve as an example of an environmentally-advanced city, it is essential to develop long-term urban strategies.

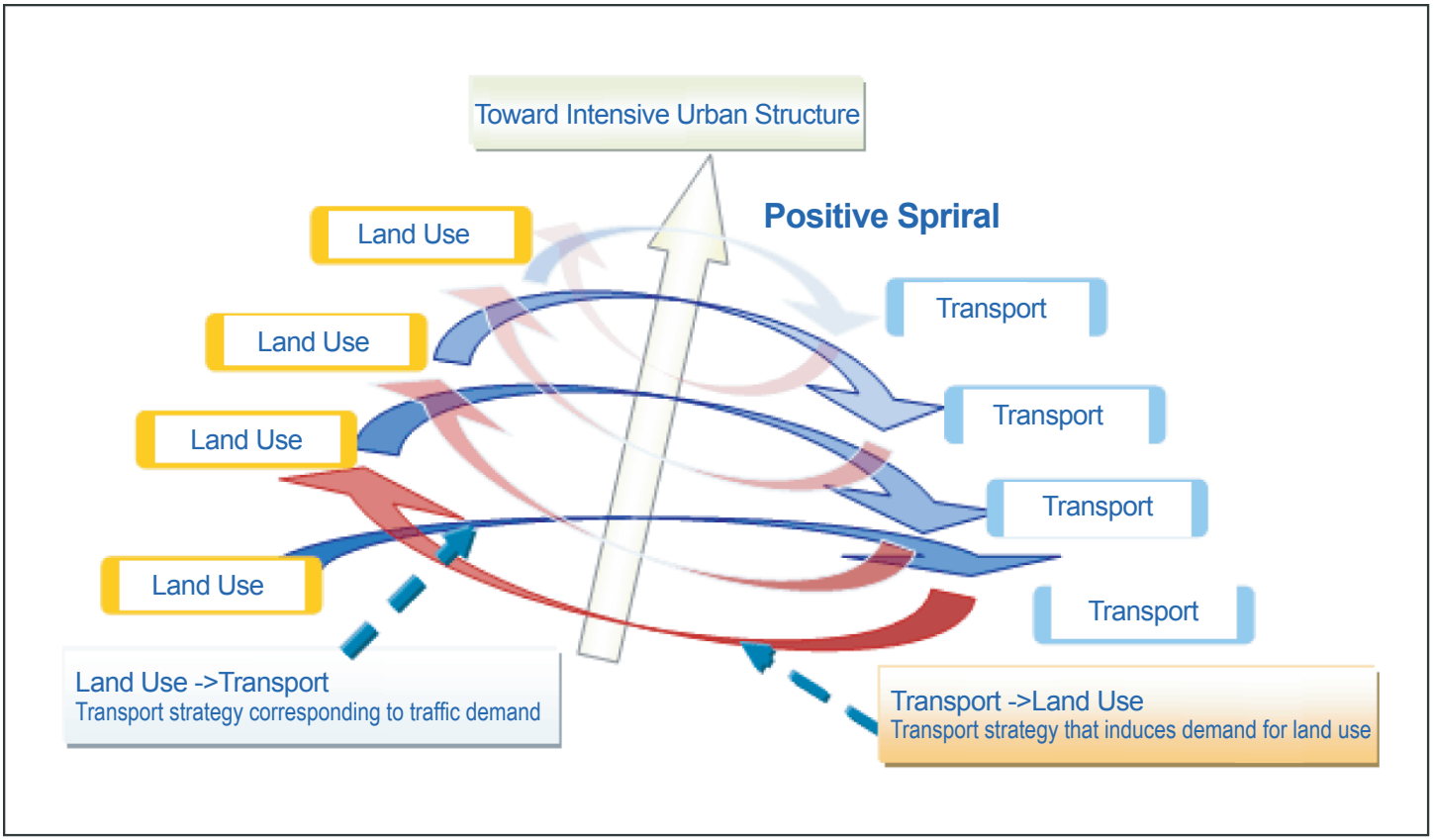


Fig. 6: Land Use-Transport Strategy toward Intensive Urban Structure

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Crisis Management

Crisis Management for the Capital's Core Functions and Business Continuity Plan

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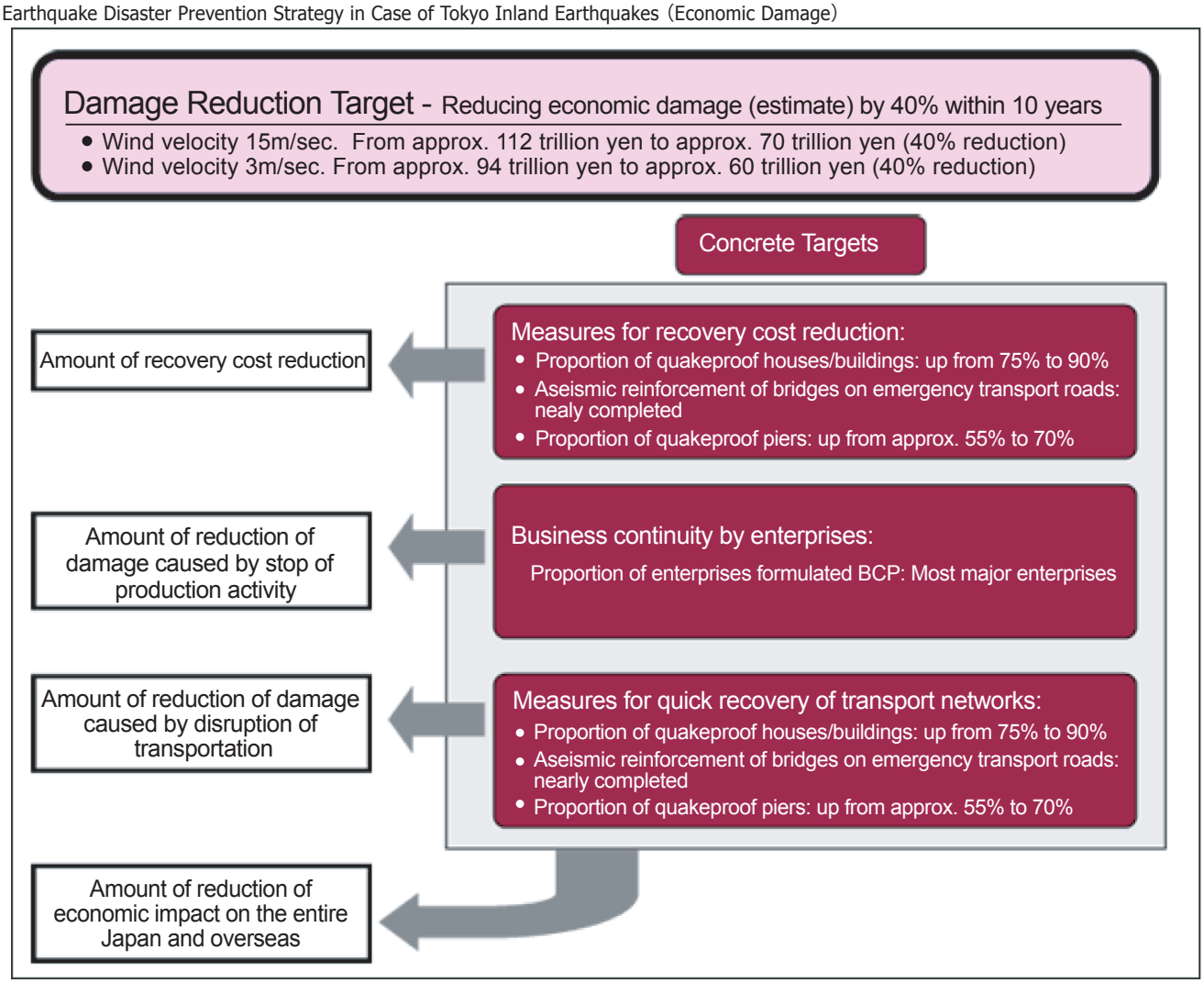
1. The Capital's Core Functions and Business Continuity Plan

Today the capital's core functions face threats such as Tokyo Inland Earthquakes, pandemic influenza and large-scale terrorism. To protect the capital, there are some opinions that Tokyo's core functions should be dispersed among other areas of the country. On the other hand, as measures as of now against these threats, both the government and private businesses are required to formulate BCP, Business Continuity Plan. (Fig.1) The purpose of BCP includes selecting important operations and estimating damage to resources such as people, goods, money, information and systems that are essential to continue of the operations, as well as securing alternative resources and/or reinforcing resources to reduce damage. Therefore, for the continuance of capital functions, it is necessary to think realistically and in detail about situations of the damage to resources which are indispensable for important operations and also about how we can secure alternatives and/or reinforce the resources.

Fig.1: Earthquake Disaster Prevention Strategy in Case of Tokyo Inland Earthquakes (Economic Damage)



Reference: Material of the Cabinet Office (Disaster Prevention)

2. Tokyo Inland Earthquakes and Business Continuit

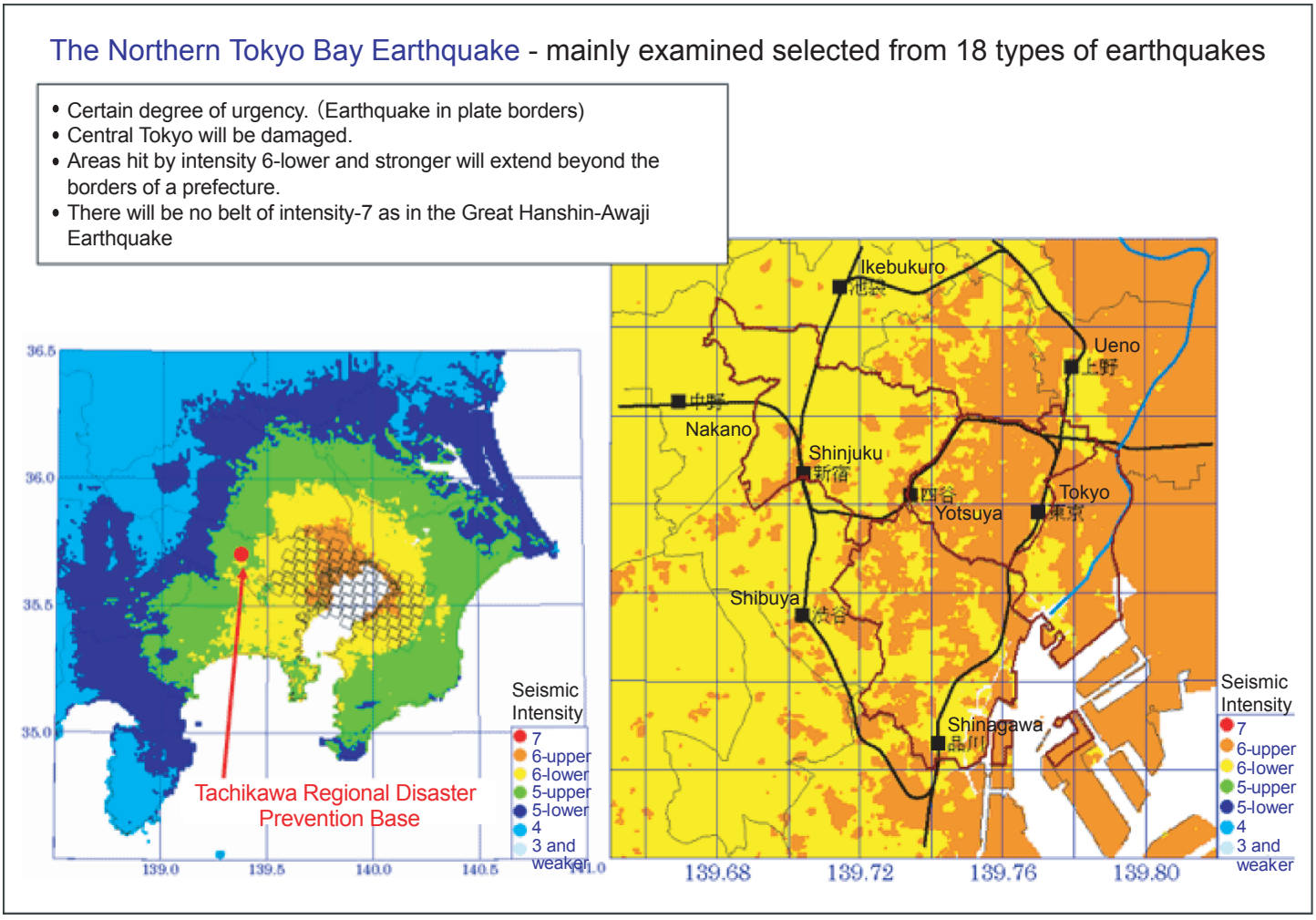
In the case of 7-magnitude-class Tokyo Inland Earthquakes, the area predicted to experience a seismic intensity* 6-upper is not very large for any of the 18 different earthquake types that have been examined (Fig 2). Since the distances between central Tokyo and cities such as Yokohama, Saitama, Chiba and Tachikawa (alternative bases of central government offices) are considerably long, it is not predicted that all of these cities will be simultaneously hit by quakes with seismic intensity 6-lower (the minimum seismic intensity to cause considerable damage) or over. Needless to say, in areas close to the epidemic-center, a part of insufficient quakeproof buildings could collapse and many of them would probably not be able to use continuously. There would be considerable human damage and people who have lost their houses would face difficulty in finding shelter. However, based on the fact that many important governmental and business buildings and facilities are earthquake-resistant and on the estimation that some of the major cities in the capital region would be left without severe damage, it should be possible for government agencies and enterprises to stay in the capital region if they wish to.

I personally anticipate that even if the core government organizations move out of central Tokyo, they would stay in cities within the capital region, such as Yokohama, Saitama, Chiba and Tachikawa, to preside over the recovery and reconstruction activities that should be their top priorities. Many government organizations already have their branch offices of Kanto region in these cities. Some private enterprises who think it is more advantageous to keep their headquarters in the capital region would stay just like the core government organizations. An example of these enterprises is those whose business activities are related to recovery and reconstruction projects. Many other businesses would move their head office functions, depending on the level of damage incurred, to major branches in cities such as Osaka and Nagoya.

Therefore, although I admit it is meaningful for major cities including Osaka and Nagoya to make preparations in advance to accept a part of businesses' core functions, the cities in the capital region should be reviewed as candidates for alternative bases for core functions at the same time.

* Seismic intensity: Japan Meteorological Agency Seismic Intensity Scale

Fig. 2: Distribution of Seismic Intensity* during the Northern Tokyo Bay Earthquake (7.3-magunitude)



Reference: Material of the Cabinet Office (Disaster Prevention)

(*) The Cabinet Office has supposed 18 types of earthquake movements. It is predicted that an earthquake with intensity-8-class, equal to the Great Kanto Earthquake (1923), will not occur within this century since earthquakes of that class tend to occur with intervals of 200 to 300 years.

3. Pandemic Disease and Business Continuity

If a new highly-virulent influenza originated in bird flu (different from the low-virulent new influenza A (H1N1) that keeps transmission), ever spreads widely, up to 25% of the whole population of Japan will be infected and 2% of those people will die, according to an estimate by the government. The mortality rate could be even higher, thus making preparations for the operational/business continuity of important activities of both the government and private businesses essential. Since infectious diseases cause more serious damage in areas of higher population density, measures against their spread must be undertaken quicker in Tokyo and the capital region that is most densely populated area, than other areas in Japan. However, if infectious diseases such as a new influenza spread, it would not be assured that a dispersion of capital functions is a very effective measure.

The reason is that the people in the cities to which the capital functions are dispersed will not be able to avoid infection simultaneously since it is virtually impossible to stop the flow of people between those cities and Tokyo/the capital region. The effectiveness of alternative base with considerable distance is limited for pandemic diseases compared to the case of earthquakes.

As for business continuity measures in case of a new influenza, the Split Team System (Fig. 3) is said to be effective for preventing the spread of the disease across an organization. In this case, the effectiveness of the system will not be different from the distance between the teams as long as they keep minimum distance to avoid face-to-face contact when the transaction between the places is rather frequent.

Fig. 3 Types of Split Team System

1. Split teams that use work at home
   Divide into two or more teams. Some teams work at home while others work at the office. When anyone in the work-at-the-office teams gets infected, this team will be replaced by another work-at-each home team.
2. Split teams that use work and stay
   Make a team to work and stay in office or near-by place. In preparation for group infection in the team, other team(s) with a normal work (or work at home) is created separately. And replace the former teams when needed.
3. Split teams that work at different places in parallel without exchange visits
   Two or more teams do the same work in parallel at places apart from each other. All correspondence is done by phone, e-mail and so on. Any direct contact each other, including use of common elevators and sharing a cafeteria, are prohibited.
4. Split teams that uses staggered shift system
   Divide into two or more teams. They work in the same place with a staggered shift system. In order to prevent infection, the workplace is disinfected and cleaned thoroughly between shifts. This effectively prevents droplet infection between teams.

Reference: Materials prepared by the author

4. Large-scale Terrorism and Business Continuity

With regard to attack in the case of terrorism or war, uniform cost-benefit evaluation of dispersing capital functions is difficult since the method of attack (physical, chemical, biological, etc.) and the scope and level of damage could vary widely. However, we should first acknowledge the width of the capital region discussed in Section 2 above.

Although the details are kept secret, the business continuity plan of the U.S. Government, called COOP, focuses on the continuation of its operations at alternate places on a scale of about one tenth of its normal level. The government is highly conscious of emergency situations that could be caused by large-scale terrorism and the like.

As far as I know, a business continuity plan with a similar purpose has not yet been considered in Japan, but it should be in the future.

For this kind of business continuity, it is concerned that the destinations of capital function dispersion are attacked simultaneously if they are publicized. In this sense, current public discussions style in Japan is not workable in order to choose the relocation place of capital functions. Of course, dispersion would have some meaning in defending capital functions since all attacks on multiple places do not always succeed, and the standpoint of private enterprises needs to be separately evaluated. But, the necessity to keep alternate destinations in secret should not be neglected.

5. Conclusion

From the perspective of crisis management for natural disasters and other threats, it is apparently better that the nation's political and economic core functions do not concentrate in one place. However, in present-day Japan, both governmental and business functions are concentrated in Tokyo/the capital region, and the full-scale dispersion of those functions would require a vast amount of money and time. We must devise business and operational continuity methods based on present conditions in preparation for a crisis that may occur even in this year.

As a promoter of the BCP, I would like to suggest that all organizations and enterprises that have headquarters in central Tokyo quickly secure alternative bases. However, when selecting the places, it is appropriate that each organization should carefully study and consider location candidates both in other place within the capital region and outside of the capital region.

Explanation of keywords

◆ Low-Carbon Society

Global warming, which is caused by an increase of greenhouse gases such as carbon dioxide generated from fuels, affects the entire world's climate. In order to prevent global warming, it is necessary to limit the emission of carbon dioxide to an amount that nature can absorb.

The Strategy for an Environmental Nation in the 21st Century, adopted in a Cabinet meeting in 2007, defines a low-carbon society as a society that stabilizes the greenhouse gas concentration in the atmosphere at a level which does not have any adverse effects on the climate and, at the same time, which allows us to enjoy comfortable and affluent lives. In 2008, the Ministry of the Environment released the fundamental principles of low-carbon society in a document named "For Creating a Low-Carbon Society" as follows: (1) minimizing carbon dioxide emission, (2) realizing simple and affluent life, and (3) co-existing with nature.

◆ Business Continuity Plan （BCP）

BCP (Business Continuity Plan) is a comprehensive action plan for government and private enterprises that defines minimum activities, recovery periods and countermeasures required for business continuity, when encountering emergencies such as natural disasters, catastrophic fires and terrorism, by analyzing and estimating the risk level that will cause discontinuance of operations. The plan aims to avoid breaks in major operations, or, should operations ever be discontinued, to ensure their quickest possible resumption.

Countermeasures include implementing backup systems, securing backup offices, speeding up safety confirmation, reserving the necessary workforce and substituting production facilities.

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Parliament Buildings around the World

◆ The United States of America (Washington DC)

The construction of the Capitol started in 1793 during the days of the first American president, George Washington. After encountering some fires, the building was reconstructed and extended. A bronze Statue of Liberty was placed on top of the white dome in 1863, and the building was completed in 1868, 75 years after the groundbreaking.

Capitol Hill's extension and renovation works are still in progress at present (© Architect of the Capitol)

◆ People's Republic of China (Beijing)

The Great Hall of the People, where the National People's Congress is held, was named by China's founding father, Mao Zedong. The inscription was written by Deng Xiao Ping. Construction began in November, 1958 with over 30,000 laborers and completed in only ten months.

A view of Great Hall of the People from Tiananmen Square (© Xinhua News Agency)

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◆ Putrajaya, a Malaysian political city, to be completed in 2010

Malaysia is a multiethnic state which consists of two states, the southern part of the Malay Peninsula and the northern part of the island of Borneo, and has a population of 26,570,000. Due to over-concentration, increased traffic congestion and the inefficiency of dispersed government offices in the capital, Kuala Lumpur, the country decided, in 1993, to relocate many of its administrative agencies to Putrajaya, about 20 km to the south. The construction of Putrajaya began in 1995 and has proceeded smoothly to date. The relocation of almost all the administrative agencies will be completed by 2010.

An adjoining city, Cyberjaya, which many IT companies are moving into, is expected to grow as a new information city. A project called the "Multimedia Super Corridor" is underway toward completion in 2010. It aims at building a zone with advanced intelligence infrastructure in the corridor, 15 km from east to west and 50 km from north to south, that covers the above-mentioned two cities and the international airport.

On the other hand, the Parliament and the Royal Palace will stay in Kuala Lumpur. The three-story Parliament House was built in1963. Both the adjacent 17-story government office building and the Parliament House have lace-like walls for shading.

Prime Minister's Office (Putrajaya)

Government office buildings along the main street (Putrajaya)

The Parliament House (Kuala Lumpur)

The office building adjacent to the Parliament House (Kuala Lumpur)

Regional Information

◆ Major Activities in Local Regions Regarding the Relocation of the Diet and Other Organizations

▶ Fukushima Prefecture

The representatives of the three-area* liaison conferences for the relocation of capital functions visited the House of Representatives and the House of Councilors on February 2, 2009 to collect information about the current situations of the conference committees of both houses in regards to the relocation of the Diet and other organizations, as well as about the schedule for future conferences. (*Tochigi /Fukushima Area, Gifu/Aichi Area and Mie/Kiou Area)

▶ Tochigi Prefecture

For one week from August 21 to 28, 2009, the Tochigi residents' assembly for promoting the relocation of the Diet and other organizations exhibited panels, distributed brochures and provided information at the booth set up at the Tochigi Prefectural Government Office to disseminate information about the meaning of and need for capital relocation.

Exhibition corner

◆ Other Topics

▶ Nara Prefecture (1,300th anniversary of the capital relocation to Heijo)

2010 is the 1,300th year since Japan's full-scale capital "Heijokyo" was born. To commemorate this event, the Heijo Sento (relocation) 1,300th Year Festival will be held around Nara Prefecture, the birth place of Heijo capital.
This April, prior to the anniversary, the official theme song, "Musica," produced by singer Shinji Tanimura, was released at "Nara Mahoroba House," a new base of Nara Pref. in Tokyo. (http://www.mahoroba-kan.jp/index.html) Also, various advance events were held both at the historical site of Heijo Palace in Nara and other regions. In September, three months before the opening of the festival, the tour passport will be released and 100-day advance events are scheduled to be held.

For details, visit the website of the Association for Commemorative Events of the 1,300th Anniversary of Nara Heijokyo Capital (http://www.1300.jp). Also, Nara Prefecture's website (http://www.pref.nara.jp) provides tourism and cultural information.

Regional Information

Mascot character "Sento-kun"

Fukushima Prefecture

About 3.3 km of Abukuma Highland Road between Yomogida PA and Hirata IC will be put in service on March 26, 2009. The road between Fukushima Airport IC and Ishikawa Bobata IC will be in service starting on August 4. During 2010, the entire 36 km connecting Yabuki IC of the Tohoku Expressway and Ono IC of the Ban-etsu Expressway will be put into service. The opening of the entire way will reduce the traveling time by half of that required by using the current roads. It will expand people's living sphere and is expected to improve their quality of life.

Scenes of Abukuma Highland Road After Opening (Aug.4, 2009)

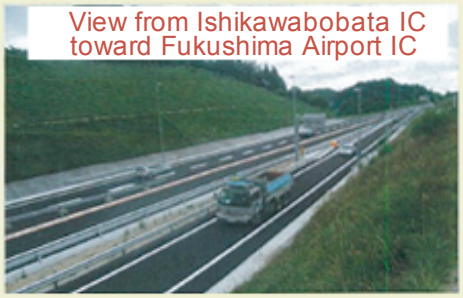
View from Fukushima Airport IC toward Tamagawa IC

Giving car travelers more convenience!

View from Ishikawabobata IC toward Fukushima Airport IC

View from Fukushima Airport IC toward Ishikawabobata IC

View from Ishikawabobata IC toward Fukushima Airport IC



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