

FOREWORD

Issues of Infrastructure Building in Japan

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An organizational reform of Japan's central government took place on January 6, 2001, with the dawn of the twenty-first century. The Ministry of Construction, Ministry of Transport, National Land Agency, and Hokkaido Development Agency were combined to form the Ministry of Land, Infrastructure and Transport, which will handle future policy for infrastructure and land, water, and air transportation. This constitutes a new stage in which most areas of infrastructure which had been administered in a vertically subdivided manner have now been integrated. Japan is entering a period of major changes, including a trend toward fewer births and an older population, increasing computerization, and growing globalization, while its economy is suffering under the effects of troubled national finances, an economic recession, and low morale. Under the present circumstances, we as civil engineers are faced with the question of how we shall fulfill our mission to build the nation's infrastructure in the new century. Here, I would like to trace the history of infrastructure building in Japan, discuss the issues which exist today, and describe the role of JSCE with respect to these issues.

1. Infrastructure Building Up To the End of World War II

Japan began to develop as a modern nation after the Meiji Restoration in 1868. Before that, in the Edo Period (1603 to 1868), there was practically no infrastructure building in a manner suited to a modern society. The Meiji government took the first steps toward building infrastructure as a basis to promote industry and make Japan a prosperous nation with a strong military. However, since the government had no Japanese engineers to help build railroads and other elements of a modern infrastructure, it hired foreign engineers for such construction. At the same time, the government sent promising students abroad to learn about technology, and also established institutions of higher education in Japan to train Japanese engineers, who eventually replaced the engineers hired from overseas.

The focus of infrastructure building shifted over time. Around 1878, the main emphasis was on river engineering because river boats were an important means of transportation at that time, and most projects consisted of low-water river work such as dredging. Thereafter, as railroads took over as the main means of inland transportation, river engineering developed into the area of major river improvements, primarily for flood prevention. Meanwhile, a railroad line between Shimbashi (in Tokyo) and Yokohama was opened in 1872, and railroads became the main focus of infrastructure building in the 1880s. The government promoted the construction of a national network of main railroad lines, and this was nearly complete by 1907, when approximately 8,000 kilometers of track had been laid. This railroad construction led to rapid gains in civil engineering technology, as well as spreading this technology throughout the country. Since railroads were the main focus in the area of land transportation, roads were given less weight than rivers and railroads. During the economic panic of the early Showa period (around 1930), road construction was promoted nationwide as a means to

combat unemployment. However, the emphasis on roads again fell sharply as Japan prepared for war.

2. Infrastructure Building Since World War II

After World War II, Japan's infrastructure building began with recovery from the devastation of war. Initially, the most pressing task was to rebuild the cities that were destroyed by bombing. Next, flood control measures were needed in response to natural disasters including Typhoon Catherine in 1947. Much effort was then put into building roads, railroads, harbors, hydroelectric dams, etc., as a basis for improvement in Japan's economic growth. In particular, road construction became a top priority for infrastructure building in the age of motorization. Many large-scale projects were completed as part of this process, including a national network of expressways, the bullet train network, the Honshu-Shikoku bridges, the Aomori-Hakodate Tunnel, Kansai International Airport, and the Tokyo Bay Bridge. Since the 1970s, efforts have also been focused on the improvement of lifestyle related elements of infrastructure which had not kept pace, such as sewers and parks.

As a result, Japan's infrastructure has now reached a generally tolerable level. But when we look at the details in comparison with other countries, it is clear that the situation is not yet acceptable when airports such as the Narita and Kansai International Airports have only one runway, only 58% of the nation's households have sewer service, and the essential outer beltway of the capital, Tokyo, still has not been completed. Meanwhile, some criticism has recently been heard to the effect that Japan's infrastructure has now attained a sufficient level and that no more public works are needed, or that public works should be reduced in scale. Many projects cannot be carried out smoothly because of local opposition. The government itself has revised or even canceled some public works projects. The question of how to respond to this situation is an urgent issue for the future of infrastructure building. Below, we will look into the background and reasons behind the present situation and the steps that are currently being taken in response.

3. Reasons for Criticism of Infrastructure Building, and Response

i) Increasing impact on the natural environment and communities due to the larger scale of infrastructure building and the diversification of technology, and lack of a timely response

Taking road construction as an example, the main reasons for criticism have been the noise and vibration from increased traffic volume and larger vehicles, air pollution from vehicle exhaust, and the effects of the roads themselves, including blockage of sunlight, roads as eyesores, and division of communities. The current response to these problems is to improve road structure and perform environmental assessments in advance. However, there are still more issues which demand immediate resolution, including the prevention of global warming and the health effects of particulate matter in diesel exhaust.

ii) Explanations to the nation's citizens and local residents have not been sufficient to obtain their understanding concerning the necessity of the projects and the benefits which would be provided.

To deal with this situation, efforts have begun to use public involvement (PI) as a means to reflect the views of the nation's citizens and local residents in public works projects, rather than unilaterally providing information about the execution of a project. Also, assessments at the time of the decision for project initiation were begun in 1998. In these assessments, projects are evaluated through analysis of cost effectiveness and other factors at the time of the decision for project initiation, and the findings are made public.

iii) Doubts concerning the transparency of bidding contracts for construction projects

Ever since the Meiji era, contractors for public works projects in Japan have been selected through private tender, or competitive bidding among providers nominated by the ordering party. With the growing internationalization of the construction market, this practice has received criticism from overseas, and public trust concerning the execution of public works projects was significantly damaged by scandals which occurred in conjunction with bidding for public works projects of local governmental organizations in the early 1990s. In 1993, major reforms were made in the bidding contract system for public works projects, including the following measures to ensure transparency and objectivity: Open competition was introduced for large scale projects; the standards used for bidder selection now must be publicized even in the case of private tender; and bidding oversight commissions have been established. To guarantee the strict implementation of these policies and their application to all public works projects, the Law to Promote Fairness in Bidding and Contracts for Public Works Projects was enacted in 2000.

4. Role of the Japan Society of Civil Engineers (JSCE)

An important task for infrastructure building in the twenty-first century will be to regain the public trust, overcoming the criticism and doubts concerning infrastructure building which we discussed above. Considering that civil engineers participate in public works projects at every stage from planning and decision-making to execution and management, it is clear that civil engineers should take the lead in dealing with this challenge. Therefore, we will need to steadily implement the measures described above in response.

Naturally, improvements in technology will need to be a part of these efforts. But in addition, it will be important to cultivate a human perspective on people and nature, as well as strong ethical standards and a refined sense of personal morality. This view is shared by JSCE, which established a set of ethical standards in 1999. The society also debated standards for civil engineers in infrastructure building as part of its annual meeting in 2000, and adopted the Code of Ethics as a resolution of the civil engineers. Additionally, JSCE certifies the qualifications of engineers as a means of representing to society that these engineers meet a certain level of ethical standards as human beings, in addition to possessing technical skills in the specialized field of civil engineering.

I believe that civil engineers will be able to win the trust of the nation's citizens in the twenty-first century, as the ones who must truly shoulder the task of building infrastructure for the sake of Japan's development as a beautiful, safe, and prosperous nation.

A handwritten signature in black ink, reading "Michio Suzuki". The script is fluid and cursive, with the first name "Michio" and last name "Suzuki" clearly distinguishable.

Michio SUZUKI