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(出版者 / Publisher)

法政大学工学部

(雑誌名 / Journal or Publication Title)

Bulletin of the Faculty of Engineering, Hosei University / 法政大学工学部  
研究集報

(巻 / Volume)

42

(開始ページ / Start Page)

15

(終了ページ / End Page)

17

(発行年 / Year)

2006-03

(URL)

<https://doi.org/10.15002/00003751>

# The Comparison of the Infrastructures in JAPAN and in Vietnam

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## 1. Introduction

The infrastructure system of a country, including the highways, tunnels and metros, is usually the measure of its developing level. Unforgettable impressions of foreigners, coming to Tokyo at the first time, are its interlacing subway network and the GPS system providing car-drivers with general traffic informations in real time: car position, driving distance and time, traffic condition and alternative directions. Obviously, in spite of their poor natural resources and earthquake calamity, highly developed technology of Japan and their intensive infrastructures are what the Japanese have made countries all over the world surprised and admired.



(a)



(b)

Photo 1. Research Institute of Public Works at Tukuba

## 2. Japanese Railway and Transportation System

Similar to other industrial countries such as France, Germany and England...in its early years of developing, Japanese domestic transportation had been mainly dependent on ships before the railway transportation. Along with the intensive modernization and development of the industry, the railway networks were consolidated making its special contribution to the transportation, satisfying the growing demand of good and passenger transport.

Today, the Japanese railroad system reaches the highest standard and the capital, Tokyo has the densest and the most modern railway and subway network in the world. Similar to other places of Japan, Tokyo has its railways and subways managed either by the state-owned Japan Railway Corporation (JR) or private companies. All of them are very safe, stable and incredibly accurate. Many modern instruments and facilities have been researched and implemented in the railway managing system, such as the earthquake-warning system and the systems for disaster prediction and assessment. Comprehensive researches have been accomplished to improve the system: model tests with wind tunnels at different dimensions and scales, shaking table, safety equipment, etc... Beside, upgrading more comfortable and convenient railways has been promoting research and development in wide ranges: simulation of passenger flow, next-generation tilting car control system, information providing system for passengers with mobility difficulties...

Very recently under testing is the most modern railroad transportation system of Japan - the superconducting magnetically-levitated transport system (Maglev). Maglev system is considered as an outstanding transportation system for its

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environmental friendliness and extremely high speed. On Yamanashi experiment route, Maglev made a world record for speed: 581km/h, a technical achievement of Maglev among many other achievements of the system.

There are such achievements because Japanese government is very interested in researching and bringing the state-of-the-art technologies into use. Research centers and institutes are placed in many areas around the country, modernly equipped and heavily invested. All of the details and parts of the devices and machines used in the research process as well as before brought into use are tested carefully. For example, from some devices such as the rail rolling testing machine, railway roadbed testing equipment, tunnel lining model testing machine, and rainfall simulator to the brake test stands, rolling stock test plant, and shaking table... are all examined sufficiently and seriously. The Japan Research Institute of Railroad Technology operates four centers and experiment stations within the country. Many international activities have been organized frequently that enforce international exchanges and cooperation. Researches and the updated achievements are widely spread through conferences, seminars and journals.

### 3. Japanese Road System

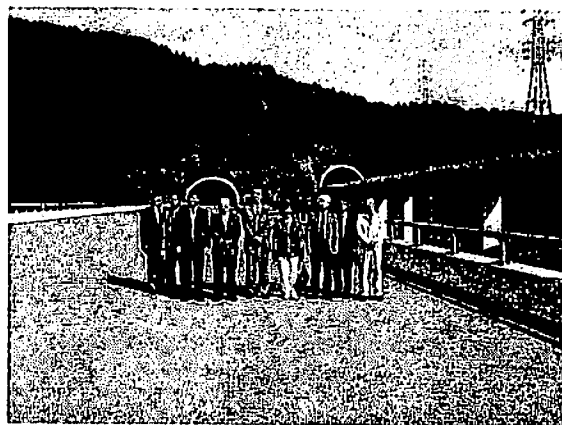
Road transport started developing quite slower than the other transports. Just after World War II, about 77% national roads of level I in Japan were not paved. But few year after, because of the great development of industry that enforced the urgent development in infrastructure, the government realized the problem and switched to invest intensively in expressway system. The first expressway in Japan was a 71.1-kilometer-long expressway, the Meishin Expressway, which was put to use in July, 1963. That short expressway, however, opened a new page in history of modern highway.

The fast development of economic and the increasing quantity of cars more and more enforced the development of road network. In the years of outbreak of cars, new constructed expressway systems played essential role in transporting passengers and goods that both rapidly increased. During this time, because of the practical demands, the Japan Highway organization (JH) was established and given privileges of efficiently managing toll roads. JH invested government funds in constructing projects, after that it paid the government money from collected fees when the roads were being used. After years of improvement, now the fee-collecting systems are effectively controlled by one of the world most-advanced non-stop automatic systems with magnetism cards.

Parallel with the management of fee collecting, maintenance and repair were performed regularly and timely include daily testing, recurrent maintenance, and setting measuring devices to resist disasters and congestion. Expressway systems of Japan have been constructed with many advantages to make sure that rails run well in any conditions. In addition, the problem of conserving and protecting environment is highly noticed. Rails which go through inhabited areas are built with barriers to resist noise and constructed harmoniously with surrounding areas.



(a)



(b)

Photo 2. The Second Tokyo-Nagoya Highway

Nowadays, expressway network in Tokyo is going to be completed. In the near future, expressway system of Tokyo will have three circles and nine radial routes connecting the central region to the suburb. This network will help to solve the problems of traffic jams and pollution that Tokyo is dealing with, to improve the vehicle stream, and to make sure a smooth driving condition. Although the road system of Japan has been highly developed, Japan still seriously focuses on researching and developing new technologies. Many road research institutes are delving into technological researches aiming at increasing the durability of structures, ensuring the safe and comfort driving at high speed, and reducing construction cost and environmental impacts. Design and construction methods have been also improved such as the application of steel-concrete composite box girder structure, new tunnel digging devices, porous pavement, etc... All these attempts have been satisfactorily required and the Japanese now have one of the most complete road network. The country's major islands were finally connected thanks to great and modern bridges and tunnels. The Japanese, therefore, set a good example in infrastructure improving that developing countries like Vietnam might follow.

#### 4. Vietnamese Infrastructures

It is easy to realize that the infrastructure of Vietnam is at the very beginning of its development. After long and continuous war, the infrastructure of a united Vietnam in 1975 was almost nothing. Major roads and bridges were heavily destroyed during and at the end of the war. Reconstruction was started but the works progressed quite slowly. Only from the 1990's when the economic policies of Vietnamese Government changed together with the lifting of American embargo, a bust in development of Vietnamese economy as well as infrastructure occurred.

The plan of Vietnamese government from now on to 2020 is to make Vietnam become a developed country. To effectuate that target, right now Vietnam must carry out a series of infrastructure tasks such as upgrading our existing railway and road system, gradually constructing North-South railway line, quickly building more expressways, bridges, and tunnels, etc. The economy of Vietnam is being developed quite fast and powerful. The activities of trading, tourism, and foreign investment increase very quickly. Parallel with development process, the population in urban areas is also booming, and the number of cars and motorcycles increases many times as before. Although the infrastructure makes fast progress, it can not satisfy the developing rate of the economy and society. For this reason, our very important task now is to develop quickly infrastructure of transport. Now the main difficulty of Vietnam is lacking invested capital. Therefore, Vietnam is appealing to foreign investment, borrowing capital from ODA, or mobilizing sources at home and abroad to develop our infrastructure following BOT project. Technologically, Vietnam also imports advanced constructing technologies through aiding projects or foreign investment such as My Thuan Bridge, Hai Van tunnel, etc.

In Vietnam, the feature of civil engineering projects is that we increase quickly the quantity of projects to ensure the minimum needs of the people, so the quality of those projects is not concerned properly. The southern Vietnam is chiefly an alluvial area of the Mekong River, so its stratum is mainly very weak. For example, some places have 50 meters of soft soil. Therefore, many civil engineering projects have many problems in design and construction. Many projects usually have the trouble with subsiding, collapsing, slipping, cracking the surface of the roads, or sloping abutment fixed quite expensively. Our tasks in some next years are gradually satisfying the needs of moving and transporting goods. Then we also continue to research the quality of projects, also the aesthetic and convenience of those projects, to step by step shorten the distance between Vietnam and other developed countries, so that we gradually finish the process of integration with the world.

#### 5. Concluding Remarks

About people in Japan, we perceive that, Japanese are very friendly, kind-hearted, and especially they are very humble and polite. Nowadays, Japan is also a country that has the large investment capital in Vietnam. Some typical projects in the cooperation and aids that Japan has given to Vietnam are Hai Van Tunnel, Can Tho Bridge, Thu Thiem Tunnel and some other projects. In the international relationship, Japan is always our good friend and a good example of creation, intelligence, and diligence for Vietnamese people to copy. In spite of many difficulties of natural and topographical features, the right direction of the government and the solidarity also the determination of the Japanese people have made many marvelous things that are admired all over the world.