

Public Investment in Japan: A Case Study of Road and Automobile

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Summary

Japan had enjoyed a comparatively high rate of economic growth throughout the postwar period since 1945. When the economic growth started, Japan drastically changed its energy source from hydroelectric power generated by many dams built along rapid stream rivers to thermal power generated by oil imported from abroad. At the same time the major means of transportation started to shift from train (rail) to automobile (road).

Infrastructure necessary for the economic development was called the "industrial base" and a large portion of the public investment was spent on strengthening it. One of the priority industrial bases was road (expressways and highways) and its construction has been much emphasized since the mid-1950s. A huge amount of automobile-related taxes, including gasoline tax, diesel oil tax, liquid petroleum gas tax, was collected annually and was earmarked for road construction. Thanks to this road improvement system and policy, Japan's automobile industry made a remarkable improvement. More cars on the road meant more auto-related tax revenue that can be used for further road construction. In this way, road and automobile were regarded as the symbol of Japan's economic progress.

In recent years, however, some people have been criticizing such semiautomatic reciprocal relationship between road and automobile. The economic development has resulted in the expansion of depopulated provincial areas. More roads in these areas, not making much contribution to the country's economic development, may mean a waste of public investment.

On the other hand, the economic development has brought about heavy concentration of people and industrial activities to Tokyo and other metropolitan regions. Streets in large cities are heavily congested, causing air pollution (and hence many asthma patients), noise and vibration, and traffic accidents. Traffic congestion also results in an enormous amount of economic loss.

The time has come to reconsider public investment in Japan.

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1. Drastic Changes of Energy Sources and Mode of Transportation

World War II ended in 1945 with Japan's surrender to the Allied Powers. Almost all Japanese cities, except for Kyoto and some small cities, were reduced to ashes. It took nearly 10 years to restore the economy and society to the prewar level.

Japan's main energy sources in the prewar period were hydro-electric power generated by many dams built along rapid streams and domestically produced coal (as Japan produces almost no oil).

An extensive national rail network developed in the prewar days was rehabilitated and railways continued to be the major means of transportation until the mid-1950s. On the other hand, the development of roads lagged behind. In 1956 Japan had a total of 865 thousand kilometers (540 thousand miles) of road, but only 14% of it, or 119 thousand kilometers, was wide enough for automobiles to drive through. The road pavement rate was a mere 5.8%. Most roads were unpaved, narrow and winding and used by people and carts. The World Bank sent the Watkins Road Survey Commission to Japan in 1956 and on October 11th of that year the Watkins Commission reported that Japan had no roads except those being planned.

Its automobile industry had also been very weak. The national government attempted in the mid-1930s to promote the automobile industry to prepare for the military invasion of the Asian Continent. But this effort failed and later during World War II auto factories were completely destroyed by the Allied Powers' air raid.

Such a road situation in Japan was in sharp contrast to that in the United States which was more than half a century ahead of Japan in terms of "motorization." In 1908, a little before World War I, Henry Ford developed a model T car and its mass production system, which lowered the car price remarkably. Before then, only rich people could afford to buy cars priced around \$850. They then went down to \$440 in 1914 and further to \$270 in 1927. By this time, one out of five Americans had come to own a car. The country had many rich oil fields and was able to procure domestically gasoline for cars.

At the turn of the century in 1904, only 7% of a total 3.4 million kilometers (2.1 million miles) of roads in the United States was paved. In 1916, President Woodrow Wilson promulgated the Federal Road Development Act and his successors continued to place emphasis on road improvement. Automobile ownership further increased in the postwar period from 28 million in 1946 to 40 million in 1950. During the Administration of President Dwight Eisenhower Congress gave special financial aid for the construction of interstate highways, and the U.S. developed the largest and most complex road system in the world.

In the meantime in 1960, Japanese Prime Minister Ikeda declared the famous "Income Doubling Plan" which had as its goal the doubling of people's income within 10 years. The economy started to grow rapidly, over 10% annually, and the Plan itself successfully achieved its goal within 7 years.

Rapid economic growth was accompanied by increasing energy demand (also over 10%

annually) which was met almost exclusively by importing oil. Oil was then by far the most efficient and abundantly available source of energy. At the same time Japan made a considerable shift from hydroelectric/coal to oil. Large amount of crude oil began to be imported from the Middle East by using mammoth tankers with low transportation cost. Huge industrial centers with port facilities were created by reclaiming bays near rapidly urbanizing Tokyo, Osaka and Nagoya(Ise Bay). Within the new industrial centers factories and plants were located in most efficient ways so that imported oil and products of one plant could be easily used by other plants (e.g. oil refinery, thermal power generator, petrochemical plants, steel, automobile, etc.). A large proportion of manufactured goods was then shipped to foreign markets. Those closely interrelated and integrated factories, or industrial complexes, were called "Kombinat" which originated in a Russian word meaning combination.

2. Automobile Industry and Road Construction

Remarkable development of the Japanese automobile industry started almost simultaneously with the shifting to oil of the country's main energy source. Table 1 shows the number of automobiles (four wheels) produced in developed countries. The Japanese automobile industry was virtually non-existent until the mid-1950s. The number of automobile produced then outpaced that of Europe around 1970, and then that of the U.S. around 1980.

Table 1 Automobile Production

(unit:thousand)

	Japan	U.S.	U.K.	West Germany	France	Italy	Korea
1960	481	7,905	1,810	2,055	1,349	644	
1965	1,875	11,138	2,178	2,976	1,616	1,175	2
1970	5,289	8,283	2,098	3,842	2,504	1,854	29
1975	6,941	8,987	1,648	3,186	2,859	1,459	37
1980	11,043	8,010	1,313	3,879	3,378	1,610	123
1985	12,271	11,649	1,314	4,446	3,016	1,573	378
1990	13,487	9,780	1,566	4,977	3,769	2,121	1,322

Note : In 1993, the number of automobiles produced in Korea was 2,050 thousand.

Source : Automobile Press, "Automobile Industry Handbook 1996," pp.214-220

The Japanese government placed special emphasis on fostering the automobile industry by offering various incentives to private automakers (Toyota, Nissan, Mitsubishi, Honda, etc.) and wide-ranging facilities. First, a tariff-barrier was set up in a move to protect the industry from powerful competitors of the West. Second, special tax benefits were granted to automakers to reduce their tax burden and encourage their capital formation. Third, their investment in plant and equipment was facilitated by extending them long-term and low-interest loans through government sponsored financial institutions. Fourth, and by far the most important factor that deserves our attention, is a massive investment in road construction since the mid-1950s.

Any country wishing to rapidly grow its economy can only do so by improving its infrastructure: roads, ports and harbors, industrial water supply systems and so on. While many developing countries have rich natural resources at their disposal, they are frequently stymied by the difficulties of improving their vulnerable infrastructure.

Japan, on the other hand, is lacking in natural resources and is located off the east coast of the Asian continent. The country must import all essential raw materials including crude oil, iron ore, coal, wheat and corn (a total of 700 million tons annually) by ships (or by air). This is why, as mentioned earlier, most manufacturing centers were located close to port facilities. Development of good transportation and communication systems among industrial areas had then become the most important factor for the country's economic development. Value-added manufactured products were then exported at a rate of 70 million tons annually. The government termed the essential infrastructure for economic activities the "industrial base" and allotted a large portion of the state budget to public works — road construction in particular. Table 2 shows the weight of public expenditure (based on the new System of National Account) compared with the Gross National Product (GNP) of some OECD member countries¹⁾. Table 3 shows a chronological chart showing the early stage of that road development in Japan. Table 4 shows that the road construction was one of the priority public works in the national budget.

Table 2 Proportion of Gross Fixed Capital Formation
Government Sector to GNP (%)

Japan		U.S.		U.K.		West Germany		France	
1970	8.2	1970	2.5	1970	4.7	1970	4.6	1970	3.6
1991	6.8	1989	1.6	1990	2.3	1990	2.3	1990	3.3

Source : Ministry of Finance, "Charted Public Finance in Japan 1994", p.171

Table 3 Japan 's Road Policy (1954~1966)

1954	The First 5-year Road Improvement Program started
1955	Local Road Tax Law
1956	Ralph W. Watkins Road Survey Commission visited Japan, Japan Highway (Public) Corporation established
1957	Law for Construction of Arterial Motorways for National Land Development
1958	Emergency Financial Law for Road Improvement Road Improvement Special Account
1959	Metropolitan (Tokyo) Expressway Corporation established
1960	Road Transport Law
1965	Nagoya-Kobe Expressway opened
1966	Emergency Law for Traffic Safety Facilities

Source : Ministry of Construction, "Road Pocketbook 1996", p.6

3. Reciprocal Relationship between Road and Automobile

Japanese automobile industry developed dramatically from the 1960s to the 1990s. In 1996 3,711 thousand cars were exported from Japan to earn US\$ 72.6 million (auto parts included). On the other hand, 464 thousand cars were imported to Japan the same year.

Most foreign visitors to Toyota or Nissan assembly plants are impressed with an efficient "Kanban" (just-in-time) system and robots and their highly automated machines. In 1994, the industry hired a total of 887 thousand workers, but if we include all auto-related industries and services (dealers, driving schools, gasoline stations, etc.) around 7 million people or one-tenth of the national labor force were engaged in auto-related works.

The "miracle" of the Japanese auto industry development is often talked about²⁾. However, even few Japanese pay attention to the financial background which enabled the industry's rapid development.

Bigger and faster airplanes require better and stronger runways in better designed airports. A well-built and high-speed mammoth tanker is useless without large scale port facilities. Similarly, a large number of automobiles require an improved road network from national highways to local streets and roads. As mentioned earlier, Japan's road system in the early 1950s was totally inadequate for the "age of motorization". How has Japan financed the construction of its national and local road network ?

Japan began to impose strict fuel taxes in 1958. As Table 3 shows, the Emergency Financial Law for Road Improvement was enacted that year. The Law, appealing that the road improvement was an urgent policy issue, stated in its article 1 that the purpose of this law was to strengthen the "industrial base" through smooth and efficient automobile traffic. Article 3 then stipulated the total amount of gasoline tax revenue should be allotted to road improvement.

The provision that the national government should give financial aid to local governments

Table 4 Percentage Breakdown of Public Investment

a) 1955 – 1961

(unit : %)

Year	Housing measures	Port (including) Fishing & airs	Agriculture & food stuff	Road improvement works	Conservation of forests & rivers	Disaster relief	Total (including others)
1955	10.4	4.1	14.7	16.1	20.4	30.7	100.0
1956	*	6.6	16.3	22.9	23.9	29.1	100.0
1957	*	8.5	15.3	25.3	21.6	22.8	100.0
1958	*	8.5	15.7	33.5	20.9	19.7	100.0
1960	4.5	7.0	13.4	34.0	16.3	20.0	100.0
1961	*	6.8	13.0	41.9	20.3	13.6	100.0

b) 1965 – 1995

(unit : %)

Year	Housing measures	Improvement of life environment facilities	Port (including) Fishing & airs	Agriculture & food stuff	Road improvement works	Conservation of forests & rivers	Total (including others)
1965	5.4	3.5	6.3	13.7	47.3	18.0	100.0
1970	7.2	4.8	8.8	14.2	44.1	17.8	100.0
1975	11.3	10.7	9.0	13.5	35.8	16.9	100.0
1980	11.9	15.2	8.3	14.1	30.1	17.4	100.0
1985	12.2	15.6	8.3	14.2	29.4	17.4	100.0
1990	11.6	16.4	8.3	14.1	28.8	18.0	100.0
1995	12.6	17.6	7.7	13.1	28.2	17.2	100.0

Notes : (1)Based on "General Account" of the national budget.

(2)Life environment includes sewerage and sanitary facilities

Sources : Ministry of Finance "Zusetsu Nihon no Zaisei(Chartered Public Finance in Japan)" 1985 & 1996

so as to cover three quarter of the local road construction cost is set in Article 5³⁾.

As years passed by, other tax items were added to the above mentioned gasoline tax. These are known as “automobile-related taxes”, which have been reserved or earmarked exclusively for road construction works and road maintenance.

At present (April 1998), regular gasoline that people buy at filling stations costs around ¥100 per liter (¥100,000 per kiloliter) or about \$3.04 per US gallon. Of this ¥48,600 per kiloliter is gasoline tax and ¥5,200 per kiloliter is local road tax (nationally collected with gasoline tax and transferred to local governments). In other words, ¥53.8 — half of the money spent on one liter of gasoline — automatically goes to road construction. For liquid petroleum gas, a fee of ¥17.50 per kilogram has to be paid. Table 5 shows the rate of automobile-related national and local taxes. These national taxes are funneled into the national government’s “Road Improvement Special Account” (Table 3) which is exclusively reserved for national road improvement works (some amount of these taxes is transferred to local governments)⁴⁾.

Now after forty years, the automobile-related taxes (its total amount was ¥5,137.5 billion in 1995) have come to account for about one third of the total amount of road improvement expenditures (¥15,810.3 billion: roughly US\$ 122 billion — see Table 6). Whenever a new expressway or a road is opened, it is soon filled with more cars consuming more fuel. As larger amounts of fuel is consumed, an increasing amount of automobile-related taxes is collected to construct yet another new highway or road. We must notice this semi-automatic expansion process of both roads and automobiles. Surely in 1958, it was quite an urgent task for the Japanese economy to promulgate the “Emergency Financial Law for Road Improvement,” but this law still exists and needs a minor amendment of Article 1 (one sentence “it is also important to improve people’s life environment” added).

4. Revenue Sources for Financing Road Improvement Works

As Table 6 shows, the money necessary for road improvement comes from (1) automobile-related national taxes and a certain amount of ordinary national taxes (personal income tax, corporation tax, consumption tax, etc.); (2) automobile-related local taxes (including transfer of national taxes), and a certain amount of ordinary local taxes (property tax, inhabitants tax, etc.) and; (3) the Fiscal Investment and Loan Program (FILP) which will be explained later.

As Table 3 showed, Japan has two major public corporations for its road improvement — Japan Highway Corporation and Metropolitan (Tokyo) Expressway Corporation. In addition, we have other road construction and management public corporations such as Hanshin (Osaka area) Expressway Corporation, Honshu-Shikoku Bridge Authority and Trans Tokyo Bay Highway Corporation. These public corporations manage toll roads and/or toll bridges to finance their current expenses, but above-mentioned FILP finances their capital expenses.

Table 5 The Rate of Automobile related Taxes (1997)

	Item	Imposed on	Tax rate	note
National Taxes	Gasoline Tax	Gasoline	¥ 48,600/kiloliter	¼ of the revenue transferred to local governments
	Local Road Tax	Gasoline	¥ 5,200/kiloliter	Total revenue transferred to local governments
	Petroleum Gas Tax	Petroleum Gas	¥ 17.50/kilogram	½ of the revenue transferred to local governments
	Automobile Tonnage Tax	The weight of an automobile	Passenger car for private use ; ¥ 6,300/0.5ton for business use ; ¥ 2,800/0.5ton	¼ of the revenue transferred to local governments
Local Taxes	Diesel Delivery Tax	Diesel	¥ 32,100/kiloliter	revenue spent by prefectures and designated cities ¹⁾
	Automobile Acquisition Tax	Automobile acquired	For individuals : 5 % of acquisition price, for business : 3 % of acquisition price	revenue goes 30 % to prefectures and 70 % to municipalities ²⁾

Note : (1) Designated City:generally cities with over 1 million population.

(2)Local taxes are collected by prefectures in the above case.

Source : " Ministry of Finance Statistics Monthly ", April 1996

Table 6 Methods of Financing Road Investment (1995)

a) Total Revenue of National & Local Taxes allocated to Road Investment

(unit : ¥billion)

National taxes	Automobile related T	Gasoline T	1,865.1
		Petroleum gas T	15.3
		Automobile tonnage T	783.7
		Sub-total	2,664.1
	Ordinary T	1,675.6	
	Total	4,339.7	
Local taxes	Automobile related T	Local Road TR	263.5
		Petroleum gas TR	15.3
		Diesel oil delivery T	1,322.2
		Automobile acquisition T	611.2
		Automobile tonnage TR	261.2
		Sub-total	2,473.4
	Ordinary T	6,042.4	
	Total	8,515.8	
Grand total		12,855.5	

Note : T=Tax or taxes

TR=National taxes transferred to local public finance

b) Financial Sources of Road Investment and its Ratio to GNP

(unit : ¥billion)

Year	National taxes	Local taxes	Total taxes	FILP	Grand total (T)	GNP	T/GNP (%)
1970	590.1	749.6	1,339.7	258.2	1,597.9	73,214	2.18
1980	1,937.9	2,624.9	4,562.8	1,266.1	5,829.0	240,176	2.43
1990	2,722.2	5,590.0	8,312.2	2,420.6	10,732.8	430,040	2.49
1995	4,339.7	8,515.8	12,855.5	2,954.8	15,810.3	482,930	3.27

Note : (1)FILP=Fiscal Investment & Loan Program

(2)Sub-total includes miscellaneous item

Source (a), (b) : Same as Table 3, p.18, p.19 and Prime Minister's Office
"Annual Statistics of Japan, 1996"

5. The Fiscal Investment and Loan Program (FILP)

The fundamental role of the government is to collect taxes, borrow money, and provide public goods and services. Apart from these activities, the government operates the financial functions of capital investments and loans, mainly on the national level. For example, postal savings, public pension funds, and insurance funds are important financial sources besides tax revenues. To foster investment and loan money, the government has constructed a credit program called the Fiscal Investment and Loan Program (FILP). Funds can be used to make loans and to invest in government enterprises for the promotion of specific policy objectives especially for road improvement⁹⁾.

What is worth paying attention to is the country's postal savings system set up over a century ago in the 1880s. It has now developed into virtually the world's most extensive

Table 7 Roads in Japan

a) High-standard Trunk Roads & Urban Expressways(as of April 1st, 1997)

unit:kilometer(0.62mile)

High-standard trunk roads	6,768
Major national land development highways	6,114
Honshu – Shikoku expressways	108
Ordinaly national roads	189
Urban expressways	552
Metropolitan (Tokyo) expressways	248
Hanshin (Osaka, Kobe) expressways	200
Designated city expressways	104

b) Ordinaly Roads (as of April 1st, 1995)

unit:kilometer(0.62mile)

Type of road	Actual length	Paved	Pavement rate
Ordinaly national roads	53,327	46,230	86.7 %
Metropolitan and prefectural roads	125,512	64,991	51.8 %
City, town and village roads	957,792	152,529	15.9 %
Total	1,136,631	263,750	23.2 %

Note : Expressway and Highway are usually equal to Turnpike Road in the U.S.
Source: Asahi Shimbun "Japan Almanac 1998", p.182

financial institution. At the end of March 1996, there were totally 16,675 bank offices (head offices and branches), while the postal savings system was operated through 24,584 post offices. Post offices are located all over Japan, even in small isolated islands, and their services are readily available to villagers.

It has been easier for this government-guaranteed financial institution to collect large amounts of money at a cost lower than commercial banks which have to pay for advertisement, office maintenance, etc. to operate their businesses. The large pool of postal savings money has enabled the national government to offer loans for public works at lower interest rates — usually a few percent lower than those of the commercial banks — and for much longer terms, sometimes over twenty years.

In addition to the general account budget (¥77,390 billion in 1997), the national government has this FILP which is frequently called the “second national budget” (¥51,357 billion in 1997). The postal savings outstanding account as of March 1997 exceeded ¥224,887 billion (about US\$ 1,874 billion) and FILP lent more than ¥2,677 billion to road-related public corporations in 1997. Thus FILP plays a crucial role in road and bridge construction. In addition, local governments can issue road construction bonds and FILP often buys these local bonds.

The present situation of roads in Japan is shown in Table 7.

6. Japan's Road Investment Faces New Issues

As mentioned earlier, the Emergency Financial Law for Road Improvement established a system in which more automobiles and more fuel consumed were linked to the increased public investment for road construction. This system, though often overlooked, contributed to a remarkable growth of Japan's automobile industry. The latest statistical data shows that on an average, 1,000 Japanese people hold 506 automobiles (the number for the U.S. was 739, for U.K. 470, for Germany 519 and for France 468). More cars and better roads have been regarded as the symbol of economic development, higher standard of living and happier life. But are more cars and better roads really benefiting all the people? I would like to review and examine some serious issues arising from the auto production/road construction cycle.

a) Inefficient Road System

Since the mid-1950s, as Japan's agricultural modernization proceeded, many young people in rural villages migrated and settled down in metropolitan areas like Tokyo, Osaka and Nagoya. They worked hard and supported Japan's economic development, but their parents were left in the villages and grew old. As a result, depopulated areas have been spreading all over Japan. At present, 1,199 municipalities (37.1% of the nation's total) are officially designated as depopulated ones, and they cover 47.7% of Japan's whole area⁶⁾. Under the name of public investment, the road network has been enlarged in these depopulated villages and private car ownership increased.

However, owing to this increase, the number of public bus passengers is decreasing and bus

companies' financial condition is worsening. It affects their services and those elderly or poor villagers who are unable to drive/buy cars face many difficulties in their daily lives.

On the other hand, too many people have gathered in metropolitan areas where traffic congestion is a serious problem. Because the growth of the automobile industry is such, road improvement cannot catch up with the increase in car ownership: whenever the road is improved by 10%, the number of traffic increases from 20% to 30%. Constant traffic congestion in cities naturally causes a significant economic loss.

By borrowing money from the public fund (FILP), national highways and expressways have been constructed in all parts of Japan. Modeled after the American turnpike system, they are expected to pay off the capital borrowed by collecting user charges. For example, the Seto Toll Bridge (with 9.4 kilometers or 6 miles length) connects the Shikoku Island (where 4.2 million people live) with the Honshu mainland across the Seto Inland Sea. This bridge was opened in 1988. Now, in addition to many ferry boats cruising in the Inland Sea, a public corporation named Honshu-Shikoku Bridge Authority is constructing two similar trans-Inland Sea toll bridges. The Akashi Bridge was completed and opened in 1998. The question is whether it is possible for three bridges to earn enough user charges to pay back the borrowed money⁷⁾.

Japan's construction industry has a secret word "dango" which means to make an illegal price-fixing agreement. On March 6, 1997, under the headline "Bid-rigging Rebel Made to Resign," Asahi Evening News reported: "A Kansai Dango group forced the president of a construction company to quit last year after his firm defied a collusive arrangement and won a public-works project at Kobe..."

Three days later, under the headline "Dango Don Gets Revenge in Report," this paper then reported: "The key figure in Kansai construction bid-rigging blew the whistle on turncoats in the cabal in a February report to the Fair Trade Commission..."

Apparently many big and famous construction companies joined this Dango group⁸⁾. I am afraid this Dango system is a common practice in public work projects. One public works project may easily cost several billion yen, and Dango makes the construction cost much higher than it should be, and has led to various corruption cases⁹⁾.

It is possible for our national government and local governments to issue bonds, in other words, to borrow money, for public investment purposes. After Japan's bubble economy burst in 1990, the government tried to encourage public investment through this technique. As a result, it is estimated that at the end of fiscal year 1997, the total amount of government borrowed money will reach ¥ 510 trillion (roughly US\$ 3,923 billion) — almost the size of the country's GNP. Should the present scale of public investment remain the same, our public finance may go bankrupt before long.

b) Road Traffic Accidents and Environmental Pollution

Between January 1946 and June 1996, the total number of deaths caused by road traffic accidents exceeded half a million. So far as the number of victims is concerned, these traffic accidents are more destructive than the A-bombs in Hiroshima and Nagasaki. Within a single year, 942,203 persons were injured and 9,942 killed by traffic accidents in 1996. It is both a

tragic and an irrevocable social loss, and it is impossible to be weighed in terms of money.

While traffic accidents happen within a second, we have another serious and long-term outcome of cars, i.e. air pollution caused by automobile gas emission. So far as automobile exhaust is concerned, the Department of Environmental Protection of the Tokyo Metropolitan Government (TMG) estimated that in 1995 the total amount of nitrogen oxygen (NO₂) automobiles discharged in the air was 45,000 tons (of which 73.0% by trucks and 27.0% by passenger cars), and that of suspended particles (SP) was 4,400 tons (75% by trucks and 25% by passenger cars).

TMG has been trying to control tightly industrial air pollution and remarkable improvement has been made concerning sulfur dioxide (SO₂) and carbon monoxide (CO) emissions over the years. However, the national government's control over automobile traffic is totally inadequate. The Environment Agency of the national government reported in 1995 that 58.8% of all automobile exhaust measurement offices in metropolitan areas reported levels higher (that means worse) than the environmental standard set for NO₂. Many people living along major trunk roads where more than 100,000 automobiles pass by everyday are suffering from noise, vibration and diseases like asthma and bronchitis. Many medical doctors are warning that people's direct exposure to NO₂ and PM (especially diesel exhaust particles — DEP) for a long time (sometimes more than 20 to 30 years) may cause cancer. Table 8 shows ominous data — even though the annual total number of cigarettes Tokyo people smoke has been fluctuating and not increasing — that of deaths caused by cancer (especially of respiratory organs) is gradually increasing year after year.

Table 8 The Number of Deaths and Cigarettes Smoked in Tokyo

	Total Deaths		Deaths caused by cancer		of which by lung, bronchus, trachea		Number of Cigarettes Tokyo people smoked	
	Number	Rate	Number	Rate	Number	Rate	Number (million)	Rate
1986	62,935	100.0	17,577	100.0	2,612	100.0	45,923	100.0
1987	63,379	100.7	18,402	104.7	2,835	108.5	40,929	89.1
1988	67,078	105.8	18,904	107.5	3,036	116.2	40,756	88.7
1989	67,629	107.5	19,677	111.9	3,206	122.7	37,842	82.4
1990	70,370	111.8	19,820	112.8	3,297	126.2	42,425	92.4
1991	70,675	113.4	20,460	116.4	3,385	129.6	42,923	93.5
1992	72,974	115.9	21,017	119.6	3,488	133.5	42,981	93.6
1993	74,758	118.7	21,457	122.1	3,598	137.7	43,143	93.9
1994	75,299	119.6	22,460	127.8	3,806	145.7	42,518	92.6
1995	78,651	125.0	23,921	136.1	3,989	152.7	42,245	92.0
1996	77,356	122.9	24,734	140.7	4,240	162.3	41,978	91.4

Note : 1) Rate:1986=100.0

2) The total number of population in Tokyo was : 11,894 thousand in 1986 and 11,771 thousand in 1994

Source : Tokyo Metropolitan Government, "Tokyo Statistical Yearbook ", (each year)

On July 6 (Thurs.) 1995, The Japan Times reported as follows : “Osaka — The national government and Hanshin Expressway (public) Corporation received a court order on Wednesday to pay ¥65million in damages to 18 Osaka residents for health damage caused by factory smoke and automobile exhaust. The ruling, by the Osaka District Court, is the first to hold auto exhaust responsible for health damage ... The court ruled that auto exhaust was directly linked to 20% of the ailments in the ward area and to 35% along Route 43 and the Osaka Ikeda section of the Hanshin Expressway...”

Only two days later, under the headline “Government, road firm lose ruling on noise, air pollution” the same paper reported that “The Supreme Court upheld a high court decision ordering the government and the operator of a Kansai region highway to pay a total ¥230 million in compensation to residents for noise and pollution by traffic. It is the first Supreme Court ruling involving road pollution, and marks the end of a 19 years battle that pitted 131 residents against the state and Hanshin Expressway Corp.”

The situation is worsening in recent years. Under the headline “Lung disease ranks sue state, carmakers over diesel exhaust,” the Japan Times reported : “A group of about 100 people suffering from lung diseases filed suit Friday (May 31st,1996), seeking an injunction against the discharge of air pollutants from diesel powered vehicles. The group filed the suit with the Tokyo District Court against the state, the Tokyo Metropolitan Government, the Tokyo Expressway Public Corporation, and seven automakers manufacturing diesel-powered vehicles. The group is demanding a total of ¥ 2.06 billion in damages ...The plaintiffs live along major highways in Tokyo and have contracted such lung diseases as bronchitis, asthma and pulmonary emphysema, allegedly from inhaling exhaust pollutants from automobiles....”

c) International Responsibility

At present, the rate of automobile ownership in developing countries is comparatively low. For example the number of people per one passenger car at the end of 1995 was: 500.0 in China, 245.6 in India, 127.4 in Pakistan and 106.2 in Indonesia. However, these Asian countries are making economic progress and so many young people in these countries are dreaming of driving a car. However, Japan’s automobile industry is eager to export to these countries (37.4% of cars produced in Japan were exported in 1996). Suppose 10 people come to own one automobile in these countries at the beginning of the 21st century, then the number of automobiles owned will easily exceed 120 million in China, 100 million in India, 12 million in Pakistan and 20 million in Indonesia.

At the end of 1995, the total number of automobile ownership in the whole world was 642 million. But according to the above scenario of increase, this number may easily double or triple. Then what will happen to the earth? Can we depend on oil as one of our inexhaustible resources? Can we supply enough fuel to those overwhelming number of automobiles for a long period? The large amount of automobile gas emission may bring about acid rain which may damage agricultural fields and forests extensively.

In addition the effect on global warming cannot be overlooked. The Organization for Economic Cooperation and Development (OECD) edited a book titled “Cars and Climate

Change” in which it explains as follows¹⁰: “Consumption of oil in road transport almost tripled between 1960 and 1990. Transport’s share in final energy use in the OECD is about 34%. In addition to oil use for vehicle operation, a significant amount of energy being used in making vehicles and providing infrastructure...The transport sector produces several greenhouse gases. They include CO₂, methane and nitrous oxide (N₂O). Of these, CO₂ contributes most to the greenhouse impact of the transport sector. Some other pollutants produced by the sector are ‘indirect’ greenhouse gases.”

7. Time to Reconsider the Public Investment System

Between the mid-1950s to 1990 (when the economic bubble burst), massive public investment contributed to strengthening the country’s industrial base. It was one of the important factors accelerating postwar rapid economic growth. Large-scale public investment in a specific region surely benefited construction companies in that region and related construction materials suppliers, real estate business and others. Politicians also often try to invite these “big projects” to their own precinct to get support from voters.

However, it seems as if millions of automobiles produced in Japan are becoming a monster like Frankenstein, destroying its creator. Many new problems have emerged.

Large-scale public investment causes continuous deficit financing which threatens the sound balance of national and local public finance. As time goes by, social and demographic circumstances change and many projects, for example, dam, road construction and land reclamation become useless and wasteful. More cars and roads are sacrificing our health and our lives.

The time has come to reconsider our public investment methods.

Recent experience indicates that the reciprocal relation between road and automobile should be re-examined to search for new modes of transportation and of financing — possibly in ways to encourage public transportation systems causing less or no environmental pollution.

Referring to the Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991, the American Transportation Secretary Samuel K. Skinner stated as follows: “The ISTEA establishes a new vision for surface transportation in America. It represents a victory for the Nation, its citizens, and our economic vitalityIt will create jobs, reduce congestion, and rebuild our infrastructure. It will help maintain mobility. It will help State and local governments address environmental issues. Finally, it will ensure America’s ability to compete in the global marketplace of the 21st Century.”

And Japan too shares the responsibility of searching for new ‘visions’ for road and automobile — to enable wiser use of resources and to achieve sustainable development of the global economy and society.

(This paper is based on the report presented at the Annual Conference International Institute of Public Finance, held in Aug. 1987 at Kyoto, Japan.)

Notes :

- 1) "Public Investment" has various definitions. In a narrow sense it means the "Public Investment" item of the national expenditure (general account) and Table 4 is based on this notion. In a broad sense it includes the total of national and local governments' public investment plus that of public corporations, and Gross Fixed Capital Formation (Government Sector) in Table 2 is based on this broad notion. It is estimated that the total amount of public investment in a broad notion was ¥48 trillion (US\$ 384 billion) in FY1996. Also it is expected that the accumulated amount of public investment between 1995 and 2004 may reach up to ¥630 trillion.
- 2) Taking a look at some figures for domestic passenger transport, 40% of the total passengers was carried by rail (16.4 billion) and 59% was by road (by buses and passenger cars — 24.0 billion) in 1970. Those two figures changed to 27% (22.6 billion) and 73% (61.3 billion) respectively in 1995.
- 3) Article 2 stipulates that the national government (Ministry of Construction) should make "Five-year Road Improvement Plan" and the second plan was started in 1958 (the first one was immature and was not implemented). The 11th plan covers from FY1993 to FY1997 and the total amount of this plan is estimated to be ¥76 trillion or US\$ 633 billion. Five-year plans are approved by the national government, via cabinet meetings, and virtually without any deliberation by the diet.
- 4) It is reported that in the U.S. gasoline tax rate was 9 cent per gallon in 1982 and from that year a portion of this tax revenue was transferred to another fund for the improvement of public transportation system, such as streetcars and subways.
- 5) Refer to Hiromitsu Ishi's "The Fiscal Investment and Loan Program and Public Enterprises" in Tokue Shibata (ed.), *Japan's Public Sector — How the Government Is Financed*, pp. 82– 102.
- 6) Asahi Shimbun, "Japan Almanac 1997" explains as follows: The average number of children one woman gives birth to in her life is called the total special birthrate. To maintain the current population, this total special birthrate must be 2.1. In Japan that rate was 4.54 in 1947 and 2.14 in 1973, but since then the rate was decreasing year after year to reach 1.43 in 1995 (1.08 in Tokyo).
- 7) The deficit of Japan Highway Public Corporation amounted to ¥21,110 billion as of March 31st, 1995.
- 8) The number of construction companies was roughly 557 thousand and they employed about 6.7 million people (10% of the national labor force population) in 1996. The majority are small-scale sub-contractors who are under the control of a few big general contractors.
- 9) Exofficio acquisition of well-paying top private jobs are quite common among high-ranking bureaucrats. It is called Amakudari.
- 10) OECD, *Cars and Climate Change*, p.21 and p.29.

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Key Words (キー・ワード)

Changes of Energy Sources (エネルギー源の転換), Reciprocal Relationship
 – Road & Automobile (道路と自動車の相互増殖関係), Automobile-related Taxes
 (自動車関係諸税), Fiscal Investment & Loan Program (財政投融资), Diesel
 Exhaust Particles (ディーゼル排気微粒子), Dango (談合)

日本の公共投資 —道路と自動車为例として—

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戦後、特に「もはや戦後でない」と経済白書が宣言した1956（昭和31）年辺から、バブル経済崩壊の平成初年までの40年間近く、日本経済は世界が羨む高度成長を遂げて来た。その鍵は何であったか。裏からいえば、多くの発展途上国が豊かな天然資源に恵まれながらも、経済成長が速くはかれない隘路は何であろうか。アフリカや中南米諸国を訪れると、港湾施設や道路といった公共施設（産業基盤）がうまく整備されない点が目立つ。この背景として、税収入や長期低利に運用できる公的資金の不足が目目される。

その点、日本は先の1956年頃よりエネルギー源を、石炭や水力発電から石油に転換し、ガソリンにより走る自動車生産に本腰を入れ始めた。自動車生産こそ広汎な関連産業を底上げするものである。そしてより多い自動車のより速い走行を促すため、公共投資を通し道路整備に全力を傾けた。この道路と自動車の相互増殖の道を、制度と財源の両面で開いたものが、1958年に公布された「道路整備緊急措置法」である。この法律により、道路の整備が経済基盤強化の戦略要点と扱われ、そのための閣議決定による道路整備五箇年計画が樹立され、自動車関係税収入が自動的に道路の公共投資の資金に向けられることとなった。財政投融资の資金もこれに加わってきた。

こうした各種の政治的措置のおかげで、日本の自動車産業は世界最高水準にまで到達して来たが、いまその余りの発展による自動車の洪水により、交通渋滞による経済損失、大気汚染や騒音の自動車公害や、年間百万件に近づく自動車事故と多くの死者、郊外発展による都市中心部の経済的衰退などのマイナス要因が、極めて大きくなり、社会的に見過ごせなくなっている。新しい政策を考える段階である。