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INDUSTRIALIZATION AND TRANSPORTATION IN JAPAN

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This paper is being circulated in a pre-publication form to elicit comments from readers and generate dialogue on the subject at this stage of the research.

INTRODUCTION

In the 1850s, after over two hundred years of national seclusion beginning in 1639, Japan opened its doors to international society and concluded a Treaty of Peace and Amity as well as a Treaty of Amity and Commerce with each of the Western powers, including the United States. By the mid-nineteenth century, the industrial revolution had already run its course in the West and liberalism was at its height, yet in Japan the last stage of feudalism clung on. There is some difference of opinion among scholars concerning what stage of economic development Japan had reached when its ports were opened to foreign trade. Generally speaking, however, it may be safely called a transitional stage between an economy supported by family-centered cottage industry and that based on the manufactory system using wage labor. The cotton and silk industries had developed to a certain degree, but spinning, reeling and weaving were still done by hand. In the cotton industry, which produced cheap clothing for mass consumption, manufactories employing a few to several dozen wage laborers existed in many areas before the opening of the ports, but even in these cases no machinery was used.

In the field of transportation, Japan lagged behind the West even more. The Tokugawa shogunate had banned the building of large-sized ships in the early seventeenth century in order to prevent people from travelling abroad. As a result there were almost no ships of ocean-going size or construction. Land transportation, by contrast, was considerably well developed, for highways had been built radiating out from the capital at Edo (now Tokyo), and a system of stations and post horses facilitated the relay of cargo and travellers. The general public, however, had limited access to these facilities, however, which had originally been built to serve the military and the administrative purposes of feudal

authority. Official barriers stood in every district which were intended both to strengthen the defense of the capital and to restrict the commodity economy within fixed limits. The use of vehicles on the highways and the construction of large bridges over major rivers were prohibited. Thus surface transportation at that time was limited to a relay system using post horses and carriers; no horse-drawn carriages, horse tramways or steam railways existed.

An extremely wide gap clearly asparated the economies of the Western countries and that of Japan in the middle of the nineteenth century. The differences were further magnified by the unequal terms of the commercial treaties signed in 1858, demanding extraterritoriality and unilateral most-favored-nation treatment as well as imposing a restricted tariff system. Japan had no legal jurisdiction over foreigners in Japan in either civil or criminal affairs, and as soon as a privilege or favor was given one country, it automatically extended to other treaty nations without any consultation or negotiation. Trade was conducted on the principle of free trade in which the stronger gained the advantage and government intervention was strictly forbidden. Decisions on tariff rates were to be determined in consultation with treaty nations, and Japan could not alter rates unilaterally. When the treaties were revised in 1866, Japan's import tariffs were uniformly lowered to a standard five percent.

These treaties were potentially quite threatening to Japan's undeveloped economy, because they deprived it of the means to defend itself against foreign commodities whose overwhelming competitive strength might have meant the flooding of the domestic market. After the initial phase, the "gunboat policy" used to break down Japan's seclusion was abandonned, but free trade proved to be equally destructive to the economy of the country.

Despite these severe odds, however, Japan's economic development after the ports were opened proved that the country's indigenous industry was largely capable of competing with foreign goods. Some industries, particularly cotton manufacture, which held a key position in the industri-

alization of the country, were hard hit by the influx of cheap, high-quality cotton fabric and cotton yarn. Goods for which foreign commodities directly substituted, white cotton cloth and raw cotton yarn among others, suffered the most seriously. But the patterned cotton fabric widely used for everyday clothing (kimono) by ordinary people was made with yarn dyed in resist patterns before weaving and was qualitatively different from the printed cotton cloth mass-produced in the Western countries. The production of this type of patterned fabric was not affected by the influx of foreign goods. Needless to say, it was labor intensive, while manufacture of the imported mass-produced fabric was labor-saving, as befitted machine production. Despite this, however, the latter was not capable of completely displacing native products in the Japanese market, for conformity in clothing styles was strongly enforced by social custom, and printed cotton cloth could not be substituted for traditional fabric unless styles of dress changed. No matter how cheap and high quality the imported fabric, it was not suitable for traditional clothing and its failure to endanger the domestic cotton fabric market was an important factor in facilitating the process of industrialization.

In exports, on the other hand, Japan benefitted from the prosperity that prevailed in the West in the 1860s with a lively trade in raw silk and tea. The price of raw silk tripled after the opening of the ports, bringing about an unprecedented boom in areas where the silk raising and reeling industry was concentrated. The silk fabric industry suffered seriously for a time due to the shortage and high price of raw silk for its looms, but in many areas, silk reeling, which had hitherto been little more than a family-centred cottage industry, at best organized on the putting-out system, began to develop on a larger scale with manufactories that employed wage labourers.

The opening of Japan to foreign trade had a variety of effects on domestic manufactures, some good, some bad, depending on the industry. Under its strong stimulus, however, although restricted for centuries to a narrow domestic market where handicraft skills were acquired through competition, industries began to prove themselves capable of overcoming the unfavorable conditions imposed by the unequal treaties. Transportation suffered most,

however, as foreign vessels advanced to the coastal shipping routes, and placed unreasonable burdens on the facilities of the inland post towns and the villages that supported them. Pressures grew gradually stronger as foreign business concerns attempted to acquire rights for a railway concession, while on lesser roads inland where feudal regulations were not so rigid, transportation on horseback of goods for import or export gradually grew quite active. In transportation as in industry, the combined impact of both positive and negative stimuli was suddenly intensified by the opening of the ports. The most important negative factor was the impending threat of colonization, while the most important positive factor was the incentive and stimulus for Japan to achieve an independent national economy. As the Meiji Restoration and subsequent reforms took place, the positive forces prevailed, creating the conditions for economic independence.

I. RESTORATION GOVERNMENT TRANSPORTATION POLICY

The Restoration government that came to power on January 3, 1868 after a period of political strife touched off by the opening of the ports, took the form of a coalition between the imperial court and the feudal lords who had played the major role in the reform or the overthrow of the shogunate. The emperor became the official head of state while the ministers of the new government were drawn mainly from the ranks of influential feudal lords. The latter continued to control their domains, except for those who had resisted the Restoration.

Initially, the Restoration government controlled and collected taxes only in the former shogunal domains. However, the system of decentralized authority rapidly collapsed as the feudal lords became improverished by the civil wars that followed the Restoration in 1868. In August 1871, the domains were completely taken over by the new government, and the former feudal lords given noble ranks by way of recompense, while a centralized government was formed to tackle the tasks of the era of development that lay ahead.

The Restoration government policy for industrialization was designed to "enrich the nation and strengthen its arms" in order to achieve wealth and power on a par with the advanced nations. In order to realize these aims, priority was given to eliminating foreign interests from key industries such as railroads, mining and coastal shipping, and to bringing under direct government control industries indispensable to the establishment of national autonomy and the strengthening of the new regime. This policy played an important role in preventing the influx of foreign capital in Japan, but it had the accompanying disadvantage of wasting government funds on extensive directly funded undertakings, which in

turn inhibited development of the private sector. To combat this tendency, as private industry began to grow rapidly in the 1880s, the government gradually began to relax its policy of direct control, transferring government enterprises to private companies. Industries related to national security such as railroads, communications and munitions, however, remained under official management.

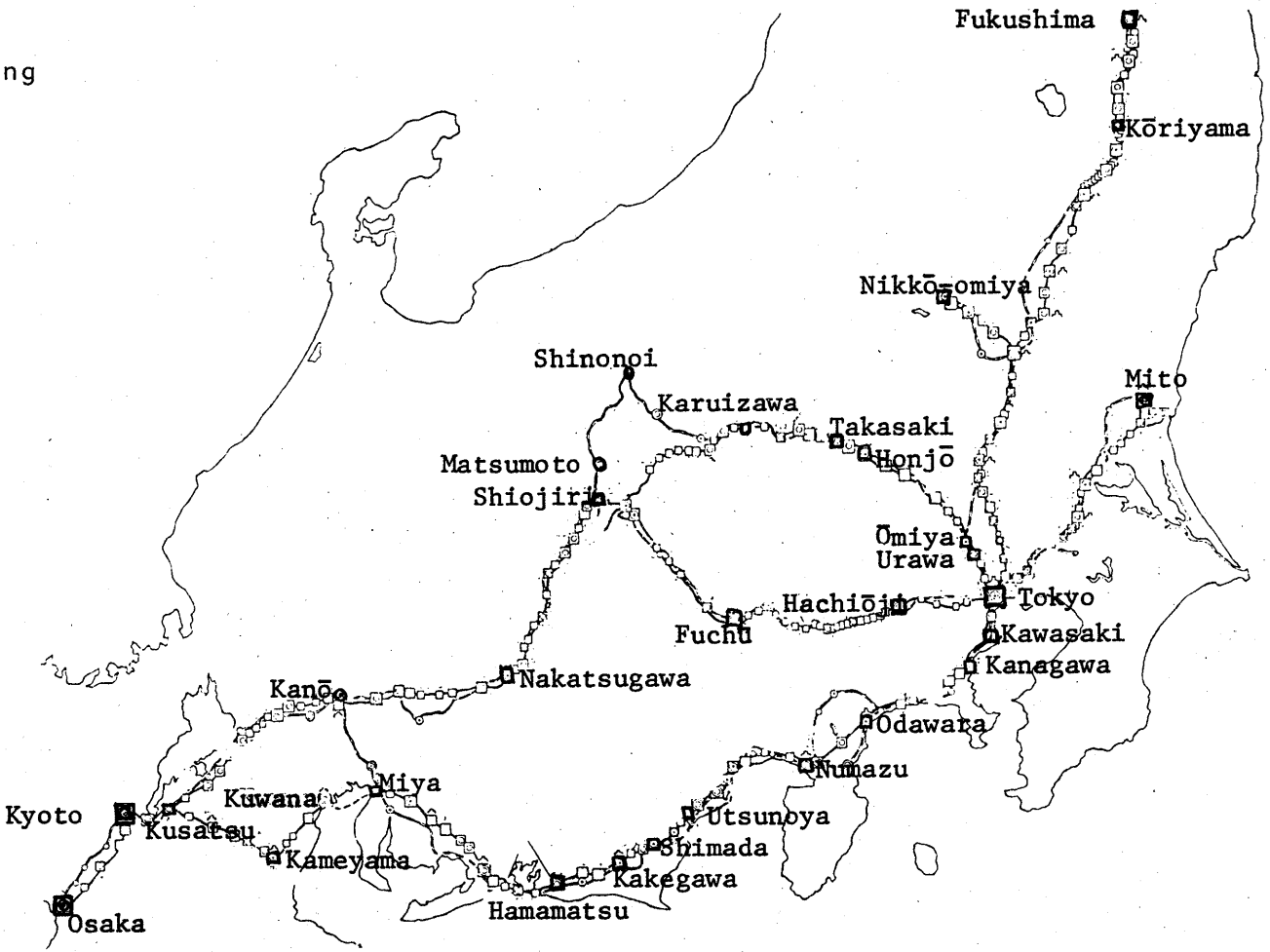
Having been formed through political struggle against the feudal shogunate, the Meiji government had from the outset a somewhat reformist and progressive character. On the other hand, because it began as a centralized, imperial government after a short period of coalition rule, it also incorporated certain autocratic aspects. As a result, it encountered frequent popular resistance in its early stages and was forced to employ a policy of trial and error in some respects. However, the former samurai class who made up the majority of the bureaucracy were generally diligent and able, as well as flexible in coping with the situations that arose. Gradually, they began to cast away old prejudices and accommodate themselves to the needs of industrialization.

The policies of the new government on transportation and communications naturally encompassed roads, railways, inland water transport and maritime shipping. Concerning land transport, one of its first tasks was to deal with the old feudal post horse system. This was originally a feudal transportation system consisting of highways and stations administered by the Tokugawa shogunate and the feudal lords and of the management of transportation services by the station officials. Five highways radiated out from Edo, where the shogunal government resided, and official stations were set up at intervals of about 10 km. along each route. These stations had inns and bearers, couriers and horses for the use of travelling samurai, and the inns and transportation services were operated by station officials appointed by the Tokugawa shogunate. In numbers of men and horses furnished on these five highways, the Tōkaidō (the most important route connecting Edo to Kyoto, where the emperor resided) had one hundred men and one hundred horses at each station, and the Nakasendō, the northern route through the mountains to Kyoto, had fifty men and fifty horses. Three lesser highways had twenty-five men and twenty-five horses at each

Diagram 1. Five Major Highways

Source: Nobujiro Ōnishi

Major stations during
Edo period



station. All other highways were less important than these five, and had far less traffic. Still, local feudal lords set up post towns along those highways and furnished them with men and horses according to the volume of traffic. Transportation of goods and passengers was restricted to the adjacent stations only.

Needless to say, the samurai class had priority in the use of these facilities. They could stay at the inns and hire bearers and horses at rates much cheaper than the ordinary price, although certain regulations did exist according to their status. In compensation for the burdens this imposed, the post towns were excused from a portion of the land tax and granted fixed subsidies, and they were also licensed to provide accommodation and transportation services for the common people as well. The common people could avail themselves of these services only insofar as it did not inconvenience official traffic, and the rates they paid were naturally much higher.

On the other hand, when official traffic was so heavy that the post towns could not provide sufficient men or mounts, they were sought and drafted in near farming villages. The station officials instructed the villages which were assigned to their respective stations to provide the necessary manpower and horses when called upon. These villages, in turn, were exempted from certain miscellaneous taxes by way of compensation. But the burden of transportation duties was far heavier than the tax exemptions received in return, and in the nineteenth century the villages surrounding official stations became severely impoverished as a result of the extremely heavy traffic.

The transportation system passed on by the Tokugawa shogunate to the Meiji government was thus a feudal one dependent on the post towns and corvee of farmers in adjacent villages, and it took the Meiji government a considerable time to abolish it. This was because there was no precedent in the nation's history of contracting private transportation services for military or administrative needs, and the new government considered the existing transportation system indispensable to establishing the foundations of its power. In the civil war that broke out between

the newly formed Meiji government and the Tokugawa shogunate, the military function built into the traditional transportation system became the focus of renewed interest. The network for mobilization and command of men and horses by station officials was well suited to the need for mobility of large quantities of military supplies and ammunition. As soon as the war began, therefore, the Meiji government's first step was to secure control of the highways and station posts, making full use of the existing system for military transportation.

The use of the system was not restricted to wartime, however. In June 1868 when the Meiji government saw that victory was certain, it initiated far-reaching reforms to strengthen the established transportation system, assigning transportation corvee duties, which had been levied only on the villages adjacent to the post towns, to all villages in the country. The proclamation issued at the time stated that this reform was intended to distribute the burden more equally, but it was clear from the start that the increasing demand for official transport business under the new regime would change the burden little or perhaps make it even heavier. Military and administrative traffic continued to be very active. The restrictions on use of bearers and horses remained almost unchanged, and public transportation rates were held down to Tokugawa levels. The new burden of corvee aroused strong opposition against the proclamation across the countryside. Villages sought exemption from the corvee on a variety of pretexts, until it became extremely difficult for the government to obtain men and horses as needed. Due to rising prices caused by civil war, the fixed fares for official use had fallen to less than half the current regular rates. The irregular transport service, moreover, exerted extremely disruptive effects on the conduct of normal agricultural work. Faced with resistance from the farmers, the government issued repeated proclamations reproaching them for idleness or attempting to appease them. Ultimately, however, it proved impossible for the government to procure large quantities of labour for transportation at wages well below half the current rate from the farming villages. Finally, pressure from the farmers demanding wages appropriate to their labour forced the government to make concessions, and most of the restrictions on use of bearers and horses for official business were further tightened,

and rates increased.

These concessions increased the financial burden of the government, rapidly undermining the foundations of the existing transportation system. Moreover, the construction of railroads begun in April 1870 further eliminated the necessity for the government to manage and operate highway transportation services through post town officials. In 1872, when Japan's first railroad was opened to traffic between Tokyo and Yokohama, these highway transportation services were entrusted to each post town. Finally, in 1875, road transport services were opened to private companies with free application and licensing under a uniform standard.

While in Japan the government faced stiff resistance from the farmers on its transportation policy, other countries were experiencing the onslaught of a world-girdling "age of the railroad." Ever since the railroad made its appearance during the latter part of the Industrial Revolution in England, it had spread rapidly throughout the world by virtue of its remarkable transportation capacity. By 1870, railway tracks stretched a total of 200,000 km., in countries around the globe, a distance equivalent to five times the circumference of the globe, and the construction continued in Asia, Africa, South America, Australia and New Zealand, not to mention Europe and North America. As a result of energetic British investment activities, India, in particular, already has about 5,000 km. of railroad. In the United States, the famous transcontinental railway opened in 1869. Thus in the West the age of the highway that had made possible the formation of national economies came to an end and the new "era of the railroad" began.

From 1867 on, the rush by entrepreneurs from all over the world to obtain railroad concessions enveloped Japan as well. In one particular incident occurring after the establishment of the Meiji government, the new rulers were jolted by the petition of A.L.C. Portman, a member of the U.S. legation, who had obtained from a former shogunal minister a railroad concession between Edo (Tokyo) and Yokohama, for confirmation of his right to build. This problem eventually developed into a diplomatic dispute between Japan and the United States on behalf of Portman. However,

the Meiji government bluntly refused Portman's demand and was supported in its stand by H.S. Parkes, the British minister to Japan. The government hastened plans to construct a national railway between Tokyo and Kyoto under direct government management by floating a loan in the London market and bringing in technical expertise from England. Decided in December 1869, prompt steps were taken to complete the loan, purchase materials and equipment and hire British engineers, and by April 1870 the government began construction of the stretch between Tokyo and Yokohama (about 18 miles). Construction was facilitated by the flat terrain of the coastal area, and progress was swift, leading to completion in October 1872. The railroad was of the 3-foot, 6-inch narrow gauge type with only a single track and its bridge spans were all of wood construction. The whole construction project was supervised by a group of British engineering experts and the trains were driven by British engineers as late as 1879. At its peak year in 1874 the number of foreign technicians employed by Japan on this railroad reached one hundred and thirteen.

TABLE 1. Foreign Employees of the Railroad Bureau, Ministry of Public Works

	Employed	Discharged	Remainder at end of December
Mar.-Dec., 1870	19	0	19
Jan.-Dec., 1871	50	7	62
Jan.-Dec., 1872	45	26	81
Jan.-Dec., 1873	56	36	101
Jan.-Dec., 1874	39	27	113
Jan.-Dec., 1875	21	27	107
Jan.-Dec., 1876	14	37	84
Jan.-Dec., 1877	3	24	63
Jan.-Dec., 1878	2	16	49
Jan.-Dec., 1879	6	17	38
Jan.-Dec., 1880	0	8	30
Jan.-Dec., 1881	0	7	23
Jan.-Dec., 1882	1	5	19
Jan.-Dec., 1883	0	2	17
Jan.-Dec., 1884	0	0	17
Jan.-Dec., 1885	0	1	16*
Total	256	240	

Source: "Historical Survey of the Ministry of Public Works."

* These foreigners were transferred to the jurisdiction of the Cabinet due to the abolition of the Ministry of Public Works.

As mentioned above, Japan's railroads got their start through a basic policy of government building and management prompted by pressure from foreign investors demanding railroad concessions. In addition to foreign pressures, however, there were domestic interests behind this accelerated policy such as the plan to connect the old and new capitals by railroad, thereby solidifying the foundations of the new government. Thus, since it grew out of the government's response to the situation at home and abroad, this first railroad was intended not so much for industrial purposes as for political ends. Because of its strong political role, it was quite fitting that it be constructed and managed by the government. Yet there were aspects of this approach that were not particularly helpful in promoting the development of the national economy. Government funds had built-in limits, and the prohibition of privately-managed railroad corporations clearly obstructed the independent development of private industry. In fact, due to insufficient government funds, by the mid-1880s railroad construction had grown extremely sluggish. Moreover, as private industries prospered, mounting criticism was focussed on the public corporations that dominated such sectors as mining, manufacturing and shipbuilding. It became clear that successful public corporations were actually holding back the development of private enterprise, while those which were unsteady simply wasted public funds.

The criticism from the private sector as well as reevaluation from within the government compelled the authorities to alter its basic principle of direct management, and from the middle of the 1880s, to begin the large-scale transfer of governmental enterprise to private management. Though the national railroads themselves were not handed over to private corporations, the government did grant generous concessions for private railroad building.

As a result, railroad construction and the extension of tracks advanced rapidly until about the mid-1890s. The private railroads, in particular, made remarkable progress, laying 2,500 km. of the total 3,400 km. of track in Japan in 1894. It was during this period that trunk lines were opened running the length and breadth of the Japanese archipelago, ushering in a genuine "age of railways" in Japan as well. Around 1880, Japan

TABLE 2. Railway Transport Figures for Tokyo-Yokohama Line

	No. of passengers		Quantity of goods (kin)*		T'tl fares for passengers and goods		Proportion of rates for passengers and goods	
	Real numbers	Index	Real numbers*	Index	Real numbers (¥)	Index	Passengers	Goods
May 1872-Dec. 1872	495,078	-	768,210	-	174,923,969	-	96.7	3.3
Jan. 1873-Dec. 1873	1,415,225	89.0	3,949,880	13.6	441,458,657	100	95.0	5.0
Jan. 1874-Dec. 1874	1,589,428	100	28,978,418	100	441,622,241	100	91.8	8.2
Jan. 1875-June 1875	895,188	-	17,420,401	-	218,377,435	-	91.5	8.5
July 1875-June 1876	1,667,724	104.9	27,999,822	96.6	408,971,701	92.6	90.9	9.1
July 1876-June 1877	1,584,162	99.6	45,515,107	157.0	392,618,787	88.9	88.2	11.8
July 1877-June 1878	1,584,509	99.6	52,469,646	181.0	405,613,613	91.8	86.6	13.4
July 1878-June 1879	1,606,048	101.0	56,220,784	194.0	425,187,893	96.3	86.4	13.6
July 1879-June 1880	1,790,072	112.6	67,313,999	232.2	483,787,426	109.5	86.3	13.7
July 1880-June 1881	2,084,221	131.1	71,435,245	246.5	562,309,050	127.3	86.9	13.1
July 1881-June 1882	2,111,078	132.8	77,097,992	266.0	573,063,130	129.8	87.3	12.7
July 1882-June 1883	2,213,551	139.2	60,439,596	208.5	559,575,765	126.7	87.7	12.3
July 1883-June 1884	2,154,895	135.5	59,150,782	204.1	536,251,841	121.4	87.7	12.3
July 1884-June 1885	1,963,174	123.5	102,674,058	354.3	523,563,836	118.6	85.3	14.7
July 1885-Dec. 1885	954,121	-	52,303,860	-	245.080,913	-	84.9	15.1
Total	24,108,474	-	723,737,800	-	6,393,305,257	-	88.4	11.6

Source: "A Historical Survey of the Ministry of Public Works"

* 1 kin = 1.32 lbs.

became self-sufficient in the technology needed to construct and operate railroads and the number of foreign technical advisors was decreased to sixteen by the end of 1885 (See Table 1). The manufacture of passenger and freight cars had begun rather early, but it was not until after the turn of the century that Japan became able to produce all of its own rails, engines and other equipment.

In sea transportation, once the ports were opened to trade, foreign vessels in great numbers advanced into shipping along the coast and in the neighboring waters, and Japanese boats, most of which were around fifty tons, were totally unable to compete with the foreign carriers. Beginning in 1870 the Japanese government thus concentrated its efforts on improving the quality of the domestic maritime fleet, actively encouraging shipbuilders to construct Western-type sailing vessels or steamships in place of the traditional Japanese single-masted, flat-bottomed boats. At the same time, the government organized a semi-public, semi-private shipping company in conjunction with powerful leaders of the

coastal shipping trade, and attempted to restore Japan's coastal shipping by using government-owned vessels. This effort, however, failed totally within a few years, and from 1875 the government turned its efforts toward assistance to leading private agents. It concentrated particularly generous assistance on the rising new Mitsubishi company by giving it use of thirteen government-owned vessels and providing a grant of over 2.53 million yen (0.37% of total revenues for ten years) for a period of ten years. As a result of this cooperative effort, Mitsubishi was able between 1875 and 1876 to edge out the rival Pacific Mail Steamship (United States) and Peninsular and Oriental Navigation Steamship (England) companies from both the coastal trade and the Shanghai route, at last opening the high seas to Japanese shipping. In 1885, Mitsubishi and other powerful companies which had also benefitted from government assistance, were amalgamated to form an enterprise called the Nippon Yūsen Kabushiki Kaisha--the Japan Shipping Corporation--with a capital of ¥11 million. By entering into a partnership with textile spinning capital, at that time gaining considerable momentum, Nippon Yūsen was able to launch ships on the ocean route to Bombay for the first time in 1893. In 1896, after a period of fierce competition with the P. & O. Steamship and other companies, Nippon Yūsen finally succeeded in opening a regular route to Bombay. This was a momentous event, not only because it signified the advancement of the Japanese shipping industry into ocean commerce, but because it meant that the spinning industry could be assured of a stable supply of raw cotton. During this period, Japan-owned vessels improved in quality, and steamships established superiority over other types of vessels by the middle of the 1890s.

Inland river transport, meanwhile, had developed gradually since the Meiji Restoration, and steamships began to be used in some rivers and lakes in the 1870s. Canals were also dug in many areas at this time, but did not prosper as had canals for a brief period in the West, because competition from the railroads was a factor from the very beginning. From around 1910, too, motor transport began to spread, further cutting into the domain of inland water transport, which rapidly declined, save for transportation for connecting and delivery services in lakes, marshes and river delta areas.

II. DEVELOPMENT OF INDUSTRIALIZATION AND ROAD TRANSPORT

As mentioned earlier, Japanese road transport was released from the restrictions of the feudal system around 1875 and a general licensing system with free applications and licensing on a uniform standard was adopted. Special protection was extended to leading agents with nationwide transport organizations in an effort to maintain the transport network, but this was discontinued by the late 1880s. Between about 1875 and into the 1890s, road transport as a whole was quite active.

This lively activity was especially apparent in the increase of vehicle traffic. As noted above, the shogunate had prohibited the use of wheeled carts on the highways, but after the Meiji Restoration, the use of the man-pulled cart was widely approved, and in 1870, the use of the jinrikisha which developed from the former was also authorized.

TABLE 3. Horse-drawn Carriages in the Early Meiji Period

	Carriages			Wagons	Total
	One-horse	Two-horse	Total		
1875	254	65	319	45	364
1876	363	87	450	59	509
1877	587	139	726	56	782
1878	866	159	1,025	104	1,129
1879	1,070	184	1,254	111	1,365
1880	1,238	217	1,455	337	1,792
1881	1,347	250	1,597	838	2,435
1882	1,593	327	1,920	2,623	4,543
1883	1,868	316	2,184	4,969	7,153

Source: Statistical Yearbook of the Japanese Empire (Nihon teikoku tōkei nenkan).

The private horse-drawn carriages of foreign diplomatic and consular offices had been in use in the opened port areas since 1854. The first Japanese-run passenger carriage service was approved for a route between Tokyo and Yokohama in 1869, but it was an exception made to connect the capital and the opened port. Such vehicles were not widely authorized until around 1872 when Japan's first railroad opened. Eventually cabs and horse-drawn carriages came into use in the cities, and stage coaches began to operate on the highways, with relay stations set up to supply fresh horses. Six routes were operated in 1872: Tokyo--Takasaki; Tokyo--Hachiōji; Tokyo--Utsunomiya; Sakai-Fukushima; Osaka--Kyoto; Hakodate--Sapporo, all of which, save for the Hakodate-Sapporo route, were privately run. The lines connecting large cities, including Tokyo, Osaka and Sapporo, had always carried heavy traffic in goods and passengers, but the new impetus for establishing these lines arose from the volume of freight of raw silk for export from the major production centers in Takasaki, Utsunomiya, Fukushima and Hachiōji to Tokyo. (Sakai, another raw silk producing center, and Tokyo were connected by river boat.) From Tokyo, of course, raw silk could be carried to the Yokohama port by railroad. These privately operated horse-drawn carriage services, unlike the national railroads, were firmly linked to transport demand. Raw silk was light-weight, able to bear high transport rates, and sensitive to fluctuations in prices, making it an ideal product upon which the new horse-drawn means of transport could establish itself. The stage coach companies, in addition to transporting general goods and passengers, contracted to transport mail for the national postal service (established in March 1871) and operated under government protection with the title and banner of official mail coaches. This often proved a necessity, for remnants of the feudal transport system lingered in many parts of the country at that time, frequently obstructing the flow of goods and passengers carried by private transport agents. In that sense, mail transport by private agents benefitted themselves and the government which did not possess its own means of postal transportation.

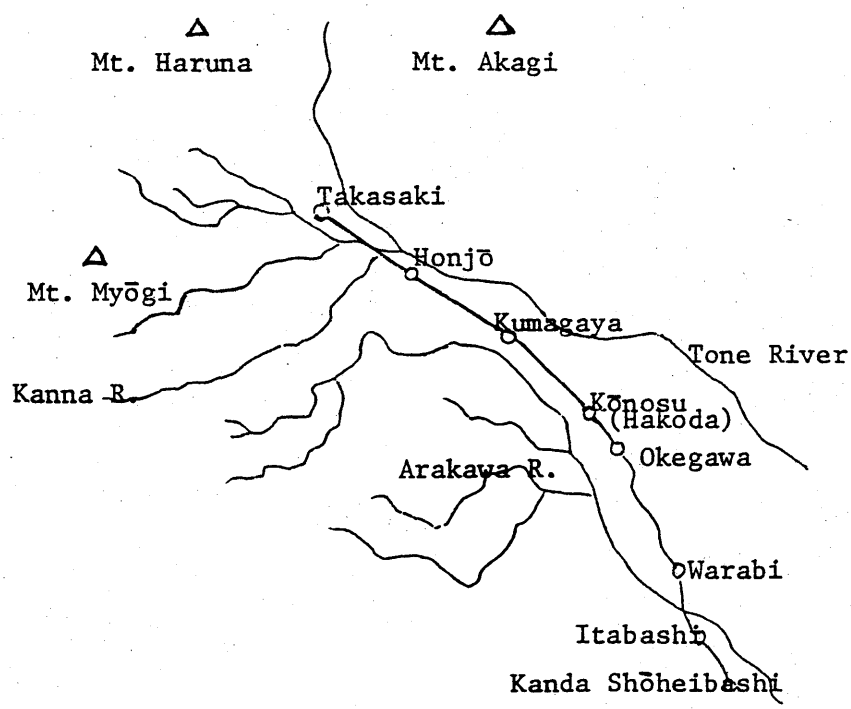
We may gain some insight into the organization and conditions of transport in this period through the example of the stage coach route between Tokyo and Takasaki to the north. In June 1872, the Nakasendō Mail Coach Company

TABLE 4. Wheeled Vehicles in Japan (1875-1935)

	Horse-drawn vehicles		Oxcarts	Wagons	Jin-rikisha	Bicycles		Automobiles		
	Passenger	Goods						Passengers		Goods
1875	319	45	1,707	115,680	113,921					
1880	1,455	337	3,109	316,664	160,531					
1885	1,959	8,567	5,949	474,290	166,058					
1890	2,877	29,088	11,027	763,056	178,041					
1895	3,226	51,592	18,544	1,042,925	206,848					
1900	6,105	90,103	30,501	1,322,309	205,390	31,594				
1905	6,173	98,434	27,085	1,355,952	164,499	89,949				
1910	8,565	158,590	35,448	1,667,520	149,567	239,474				
						Motor-cycles	Bicycles			
1915	8,091	183,969	32,010	1,842,594	115,229	660	706,467	873		24
1920	6,178	252,747	44,455	2,143,397	110,405	2,478	2,051,104	7,023		889
1925	3,905	306,038	66,308	2,186,775	79,832	12,378	4,070,614	18,562		7,884
1930	2,175	308,914	98,690	1,807,788	42,635	21,378	5,318,230	57,827		30,881
								Ordinary	Special	Small-model
1935	1,083	297,761	115,197	1,569,460	15,376			120,926	5,065	49,913

Source: Statistical Yearbook of the Japanese Empire (Nihon teikoku tōkei nenkan).

Diagram 2: Nakasendō Mail Coach Company route (1872)



established a horse-drawn wagon service between Tokyo and Takasaki, having obtained the official title and banner of postal delivery service in February of the same year under the condition it transport 37.5 kg. of mail per day free of charge. In return, the government leased the company about 50 ares of land in Tokyo and provided a no-interest loan to be repaid in annual installments over a ten-year period. Although the corporate nature of the company is not clear, it must have taken the form of a kind of partnership. It maintained a head office in Tokyo, branch offices in Kumagaya and Takasaki and local offices in Warabi, Okegawa and Honjō. Two two-horse wagons moved daily between Tokyo and Takasaki, and between Tokyo and Kumagaya two single-horse wagons, and a total of fifty horses were stabled in Tokyo and Takasaki as well as at its regional and local branches along the route. (See Diagram 2)

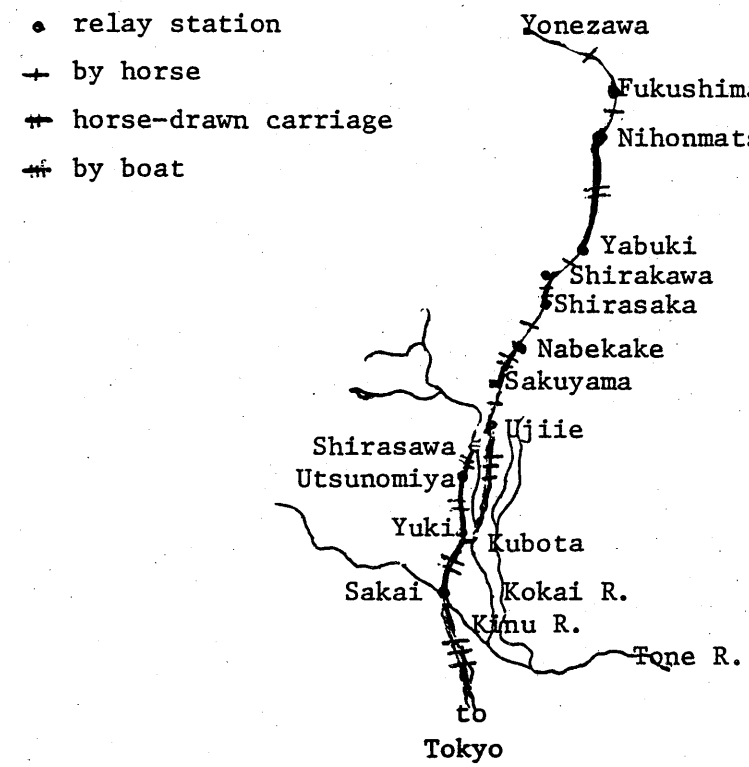
These wagons departed Tokyo or Takasaki at six in the morning, arriving at their respective destinations by six in the evening, one round trip per day between Tokyo and Takasaki and between Tokyo and Kumagaya. The distance between Tokyo and Takasaki is about 110 km., so the vehicles were expected to average a speed of about 10 km. per hour. Fares between the two cities varied depending on the amount of grade, so that, for example, the charge from Tokyo to Takasaki, which was an uphill route, was ¥2.37 per 150 kg., while that from Takasaki to Tokyo, generally downhill, was ¥2.13. This system of charges was the same as that used in the feudal period, showing that a modern system had yet to become established. Vehicle transport charges were 1.8 times as high as that for carrying by pack horse, so it was only feasible for the transport of passengers or high-priced goods such as raw silk for export.

No sooner had it opened for business, however, than the horse-drawn wagon transport service faced the problem of poor road conditions. Up until that time there had been no vehicle traffic on Japanese roads, and roadbed and road surfaces were extremely poor and uneven. There were, moreover, no bridges over many of the revers, and vehicles had to be carried to the other side of the river by boat unless they were shallow enough to ford. As a result, company freight wagons seldom arrived on schedule, often being as much as two or three hours late. Especially

during the rainy season the wagons had great difficulty getting through, and often broke down or were overturned along the way. In any event, the appearance of wheeled vehicles brought to immediate attention the need to widen, repair, and maintain the roads.

These road conditions brought about a makeshift system employing various means of transport depending on specific road conditions. A good example was the horse-drawn cart service between Sakai and Fukushima mentioned above. According to the plan presented for approval to the government by the Rikuu Transport Company in October 1872, the route contained many sections for alternate transport by pack horse or boat. (See Diagram 3)

Diagram 3: Proposed route of Rikuu Highway Transport Company



* Horse-drawn carriages were used only when goods had to be sent by express. Horses were used except for express service.

This system of mixed transport which necessitated frequent transhipping of goods was naturally less convenient than through transport by cart in

TABLE 5. Old and New Transport Means and Rates in the Rikuu Highway*

Section	Distance	Former means of transport and rates				Scheduled means of transport and fares after the revision			
		Public fares		Private fares		By wagon, horseback, boat		By horseback and boat	
		Means	Fares	Means	Fares	Means	Fares	Means	Fares
			sen		sen		sen		sen
Fukushima-Nihonmatsu	5 0	relay horse	50.00	relay horse	50.00	through horse	40.00	through horse	40.00
Nihonmatsu-Yabuki	11 0	"	66.00	"	66.00	horse-drawn carriage	85.00	"	64.00
Yabuki-Shirakawa	4 0	"	20.00	"	20.00	through horse	19.00	"	19.00
Shirakawa-Shirasaka	2 0	"	10.00	"	10.00	horse-drawn carriage	14.00	"	9.00
Shirasaka-Nabekake	6 0	"	36.00	through horse	22.50	through horse	21.50	"	21.50
Nabekake-Sakuyama	5 18	"	21.70	"	21.70	horse-drawn carriage	38.50	"	20.00
Sakuyama-Ujiie	5 12	"	31.76	"	21.00	through horse	20.50	"	20.50
Ujiie-Kubota	13 10	relay boat	30.50	relay boat	30.50	through boat	25.00	through boat	25.00
Kubota-Sakai	6	relay horse	33.00	relay horse	33.00	horse-drawn carriage	42.00	through horse	30.00
Sakai-Tokyo	15	relay boat	16.00	relay boat	16.00	through boat	13.00	through boat	13.00
Total	74		326.26		290.70		318.50		262.00

* All rates per 36 kan (1 kan = 3.75 kg.)

terms of the time and expense, as well as probable load damage. Still, documents show that mixed cart transport could cover the distance between Fukushima and Sakai in 97 hours, 48 hours less than the time needed to go by pack horse and boat alone. Of course, the fare when horse-drawn cart was added was ¥305.5 or ¥56.5 higher than pack horse and boat only. For raw silk, however, which was very sensitive to fluctuations in price, arrival at the marketplace even 48 hours earlier often more than compensated for the considerably higher fare. The Rikuu Highway Transport Company applied for two methods of transport; one including use of horse-carts and the other excluding it. Whatever ingenious methods were used, transport by mixed means vividly reflected both the bad condition of the roads and the determination of those engaged in transportation services to shorten carrying time as much as possible.

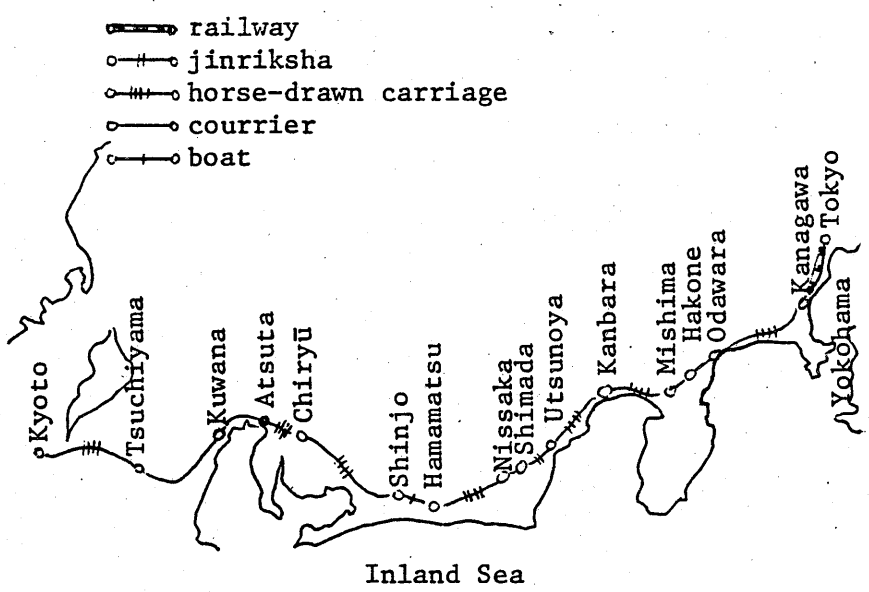
TABLE 6. Old and New Means of Transport and Charges on the Rikuu Highway

Route	Distance (ri)*	Pre-revision means and fares		Post-revision means and fares			
				Horse drawn carriage and through horse		Through horse	
		Means	Fare	Means	Fare	Means	Fare
Ujiie-Shirasawa	1.5	relay horse	9.00	through horse	8.25	through horse	8.25
Shirasawa-Utsunomiya	3.0	relay horse	18.00	horse-drawn carriage	21.00	through horse	17.00
Utsunomiya-Yūki	7.0	relay horse	42.00	horse-drawn carriage	49.00	through horse	38.50
Yūki-Sakai	6.0	relay horse	33.00	horse-drawn	42.00	through horse	29.00
Total	17.5		102.00		120.25		92.75

Notes: Compiled from original schedule of fares; 1 ri = 2.44 miles;
1 sen = 1/100 of a yen, equal to 10 rin in contemporary coinage.

Transportation by mixed means was also used in the coach transport of mail opened by the Domestic Transport Company (the present Nippon Express Co., Ltd.) on the Tōkaidō Highway in August 1874. This company had its roots in an express courier service for delivery of mail, money and luxury goods that had operated since the early Tokugawa period, and with

Diagram 4: Tōkaidō Postal Route, as of 1877



the opening of the national postal service, it was subcontracted to deliver mail. Since its incorporation in July 1872, the company received special protection from the government. The inauguration of its Kanagawa-Odawara stage coach route in August 1874 was designed to facilitate the delivery of the national mail. Later, in November 1875, this line was extended to Atsuta (Nagoya) and in August 1876 to Kyoto. An order issued by the postal service administration to the Domestic Transport Company in December 1877 shows that the distance between Kanagawa and Kyoto (495 km.) was divided into fourteen sections. A carriage departing Kanagawa in the afternoon was expected to arrive in Kyoto fifty-six hours later and one leaving in the evening to arriva in sixty hours. However, transportation completely by carriage was impossible for the entire distance because of bad road conditions. Instead, the Odawara-Hakone-Mishima, Shimada-Nissaka and Atsuta-Kuwana-Tsuchiyama sections were covered by express runners, the Utsunoya-Shimada section by jinrikisha and the Hamamatsu-Shinjo section by riverboat. Only seven sections were passable by horse-drawn carriage. In other words, in order to dispatch the delivery of mail over this long distance every feasible means of transport had to be mobilized. Existing documents show that the Domestic Transport Company was still delivering mail on the Tōkaidō Highway in 1880, and that the use of mixed means of transportation still continued. Some improvements were carried out, however, as indicated by an order of February, 1883, showing that on the

Atsuta-Kuwana-Tsuchiyama sections express runners were replaced by jinrikisha, and on the Utsunoya and Kanaya (the station next to Shimada) section jinrikishas were replaced by horse-drawn carriage.

In the 1880s, on the other hand, horse-drawn carriage transport began almost simultaneously in many parts of the country. The number of horse-drawn carriages rapidly increased from 364 in 1875 to 1,792 in 1880, 10,526 in 1885, and to 31,965 in 1890. The increased use of horse-drawn carts was particularly striking; the number swelling from only 45 in 1875 to 29,088 in 1890, and by 1882, to 2,623, surpassing the figure for horse-drawn passenger carriages (1,920). The number of team-drawn stagecoaches for long-distance transportation also gradually increased. These increases in the number of carts and stagecoaches for long-distance transportation were reflection of the growth of local industry and the development of a flow of goods throughout the countryside. In fact, Japan's local industry grew steadily from the late 1870s, stimulated both by the establishment of the local government system and through the expansion of international trade, and manufactories powered by water wheels appeared in many areas. In the silk reeling and cotton-spinning industries, endogenous skills began to show considerable improvement. The development of horse-drawn vehicle transport in the 1880s was a natural outgrowth of this heightened economic activity.

The development of vehicle transport naturally called attention to the necessity for repairing existing roads and building new ones. The existing road network, originally built in the Tokugawa period to serve the needs of military and official transport, contained portions topographically and directionally inappropriate in the distribution of local products. Moreover, the narrowness and softness of the road surface were not designed for the passage of wheeled vehicles.

The movement to construct new roads or repair old one did not wait for the leadership of the government, but began with initiatives by local residents who applied for permission to repair the roads as their needs required. This movement was particularly noticeable after the opening of the ports in and around Yokohama where roads were filled with the

traffic of imported and exported goods. The Tsukui route (from the Kōshū Highway's Yoshino station to Nakano-Arakawa-Kubosawa-Hashimoto-Shibafu and Yokohama, called the "silk road") and the Yagurazawa route (Gotenba-Ashigara Pass-Yagurazawa-Kamiyama-Soya-Atsugi-Shibafu-Yokohama, called the "tea road"), for example, were heavily used from the early period, and as these two arteries were developed, projects to improve old roads and build new ones were undertaken in many districts. Around Gotenba, for example, after 1872 repeated repairs were carried out on the Old Ashigara Road (along the Yagurazawa route) and the byroad running directly to Kamiyama (Matsuda) without going through Sekimoto at the foot of the pass on the eastern side of the Ashigara Pass, suddenly became the scene of great activity. In addition, beginning in 1872, new roads were constructed over the mountains along the western border of Kanagawa prefecture as part of the effort to find a more direct route for the transport of export goods such as tea and raw silk.

At the outset, local residents had to improve and maintain, as well as construct, roads on their own initiative. After 1873, however, some attempts were made to bring road improvement under government administration. According to a Ministry of Finance directive, "Regulations on River, Port and Road Improvement" issued to each prefectural government, roads were classified into three classes and a general standard for distribution of the financial burden was also determined (first and second class roads were to be supported 60 percent by the national treasury and 40 percent by the prefectural government, while the expense of third degree roads was to be shouldered entirely by local governments.) Cabinet Order No. 60, issued in June 1876, divided roads into national, prefectural and local roads, and each division was subdivided into three classes. Cabinet Order No. 1 of January 1885, however, abolished the classification of national roads, and a new system was established numbering national roads from 1 to 44.

Yet from the beginning, because of the carryover of Tokugawa period customs, the burden of expenses of road improvement fell heaviest on local communities. The weight of that cost was aggravated even more from the mid-1870s as a result of the acute financial crisis in national government

brought about by the continued payment of government stipends to the former samurai after the abolition of the domains and by the various costs of administration and aid to industry as well as of the suppression of samurai rebellions. In 1881, the burden was again augmented when the government cut off funds provided to prefectural administrations for public works projects in the process of raising the funds to recover the value of the inflated government notes issued in the early Meiji period. Expenses for public works as recorded in government accounts decreased sharply from ¥2,510,000 in fiscal 1880 to ¥370,000 in fiscal 1881, due most importantly to "the abolition of the system of government subsidies to the prefectural governments for public works from this fiscal year." The burden of improvement of all national roads fell heaviest on local government and people, as we shall see below in the case Tokyo prefecture, and conflicts arose because those who used and abused the national roads were often outsiders. This government policy provoked great antagonism among the local people, as demonstrated by popular uprisings such as the Fukushima Incident of November 1882.

Despite the efforts of local citizens to improve existing roads and construct new ones, however, road conditions were extremely bad, as Sir Harry Smith Parkes, the British minister to Japan, reported to his government on October 5, 1877, 'It is notorious that in constructing the great roads which traverse all the principal Japanese islands, military considerations were chiefly looked to, and the convenience of trade little consulted. Besides, the Japanese were, until lately, unacquainted with the invention of Macadam, and their roads are constructed of such soft materials that, with few exceptions, they become almost impassable for wheeled vehicles after heavy rains. Much has been done to improve the existing roads and open new ones, but at the present time the only tolerable roads in Japan are the Tōkaidō, as far as Odawara, and one or two other sections, the Ōshiū Kaidō to Utsunomiya, and the Nakasendō, as far as Takasaki.' (See Ōkuma Documents A-2824: The Report of British Counsul on the Nature and Cost of Japanese Domestic Transportation, 1887).

As Sir Parkes' report suggests, most Japanese roads around 1877 could not support vehicle traffic, the only comparatively good ones being the Tokyo-

Odawara, Tokyo-Takasaki and Tokyo-Utsunomiya sections. In even those sections, it was impossible for the stage coaches to move on schedule, and accidents often occurred. Unlike Europe, however, because of the rapid decrease of long distance road transport which accompanied the development of railways in Japan, the use of toll charges to fund road maintenance and improvement was not adopted until the appearance of expressways after the Second World War.

III. DEVELOPMENT OF URBAN TRANSPORT

Urban transport, particularly in large metropolitan areas such as Tokyo, Yokohama, Osaka and Kobe, experienced more drastic changes than did inter-city or local roads. The greatest change was brought by the rapid influx of population to the cities and appearance of wheeled vehicles producing overcrowded conditions and traffic jams. For example, the population of Tokyo prefecture increased from 957,000 to 1880 to 1,521,000 in 1890, almost 1.6 times in one decade. Imported means of transport such as cabs and horse-drawn omnibuses appeared earlier in Tokyo than in other cities, further aggravating the overcrowded conditions.

The horse-drawn carriage, which later changed the whole pattern of city traffic, began with the private carriages used by foreign diplomatic and consular offices to travel between Yokohama and Edo (Tokyo) after the opening of the ports. In March 1869, a Japanese firm applied for and was granted a license to run an omnibus service between Yokohama and Tokyo. The Ginza-Nihonbashi section of its proposed route to Nihonbashi in the centre of Tokyo was ordered to be changed to run between Ginza and the Tsukiji foreign settlement, but the rest of its application was granted without change, and horse-drawn omnibus service began between Yokohama and Tokyo in June 1869. This was both the first passenger omnibus service and the first in any urban area in Japan.

In April 1870, Kōsuke Takayama and two residents of Tokyo applied to the prefectural government for a license to run a passenger service using jinrikisha, a rebuilt version of the traditional two-wheeled cart. Permission was granted, and by 1880, the numbers of these vehicles, which were well suited to road conditions because of their simple construction and low speed, rapidly proliferated. By 1880 about 25,000 jinrikisha

were plying the streets of Tokyo and the vicinity. The traffic of carts and beasts of burden also increased, producing extreme congestion in the city, which is vividly portrayed in color woodblock prints (nishiki-e) of the time.

These severe traffic problems in the city led to the enactment of a succession of regulations on vehicles. Thus, in May 1869, when the Tokyo prefectural government authorized a horse-drawn passenger carriage service between Yokohama and Tokyo, it notified the applicants that carts would be subject to eight-point regulations. These were supplemented the following year with "Five Regulations on Jinrikisha" and "Regulations on Horse-drawn Carriages." Based on Cabinet Order No.114, these regulations were enacted on April 22 and March 29, 1870, respectively. Most of them were aimed at promoting traffic safety, but some limited fares to reasonable levels, and others went so far as to stipulate proper deportment of carriage drivers towards members of the nobility, high officials and army officers. One item, stipulating that drivers should alight from their vehicles to salute, indicates how far traffic regulations still had to go before modern traffic rules would develop. Similar stipulations appeared in the "Regulations on the Movement of Horse-drawn Carriages" and "Regulations on Jinrikisha Driving" issued in May 1871, but were absent from the "Horse-drawn Carriage Regulations" that came out in April 1872, and "Instructions for Jinrikisha Drivers" of May 1872. Though horse-drawn carriages were expected to run on the lefthand side from the beginning, the regulations of 1877 gave special emphasis to the stipulation that jinrikisha as well run on the left side of the road.

Another problem that accompanied the emergence of vehicular traffic was that of road upkeep and improvement. This problem came to a head in Tokyo in late 1870. In December 1870, the Ministry of Finance questioned the Tokyo government about tax levies on vehicles. Later developments suggest that this inquiry was part of an effort to raise funds for road improvement. At the time, however, the Tokyo prefectural government had established no specific policy to raise funds for the improvement of roads, save for a fixed levy on horse-drawn carriages used for commercial purposes (25 ryō for 2-horse vehicles; half that amount for one-horse vehicles).

TABLE 7. Number of Vehicles in Tokyo Prefecture

Vehicle / Year	Horse-drawn carriages		Jinrikisha	Oxcart	Wagon
	passenger	transport			
1876	249	40	25,038	72	19,475
1877	470	60	24,764	76	30,707
1880	476	61	25,257	76	30,238
1881	423	54	24,173	72	34,040
1882	420	135	25,536	90	37,341
1883	428	?	28,055	100	42,343
1884	477	?	29,796	148	46,935
1885	547	?	31,838	149	50,973
1886	516	?	32,793	157	55,842
1887	526	?	33,247	166	57,950
1888	582		40,929		
1889	?	?	?	?	?
1890	693	1,806	41,958	131	68,775

Source: Compiled from Tokyo Prefectural Government Statistics.

In the spring of 1871, however, the city government adopted a plan to improve major streets in the centre of the city. To fund the plan, it sought a tax on all existing vehicles in the area.

The plan called for construction of paved streets for vehicular traffic on the principal routes through the city. These included the sections of the Tōkaidō from Takanawaguchi through Shibaguchibashi to Owarichō 2-chōme, from Owarichō 2-chōme to Kyōbashi, Tatamichō, Gorobēchō to Kajibashimon, as well as from Tatamichō to Sujichigaimon, and from Nihonbashi to Asakusa. The cost was to be met through a vehicle tax of 3 percent of transport income.

Specifications for the new roads called for a stone paved surface 18 to 24 feet wide in the middle of the road and the space on either side was set aside for sidewalks. The width of the sidewalks and specifications for paving are not clear. Nevertheless, the plan was the first to set aside separate sections for vehicular and pedestrian traffic on the streets, and in this sense is a landmark in the history of road building in Japan.

The improvement plan was extended to include additional sections: 1) from Owarichō to the Tsukiji foreign settlement; 2) from Owarichō to Yamashita Monnai; 3) from Shibaguchi 1-chōme Kashi-dōri to Saiwaibashi Monnai; 4) from the street in front of the Tokyo prefectural government offices to the Ministry of Foreign Affairs, and 5) from Kajibashimon and Babasaki-mon to Ōtemon. The Tokyo prefectural government funded the improvement of sections 2, 3, and 4, and national funds were used only on special sections such as 1 and 5. This suggests that the Meiji government took responsibility for certain areas just as the bakufu had in the Edo period. This responsibility was limited to areas related to national government offices, particularly in Kajibashi and Babasaki Monnai.

In other countries, road repair in the feudal period was the responsibility of parish or other local units. With the development of long-distance road transport and vehicle transport, a system of tolls or vehicle levies quickly grew up to shift the burden of upkeep to road users. In Japan, while the vehicle tax was introduced quite early, the long-distance vehicle transport business was rapidly displaced by the development of railroads, leaving the heavy burden of road maintenance to be borne by local residents for many years to come. The disappearance of long-distance vehicular transportation cut off a major source of highway revenue, and reinforced the traditional idea that the primary beneficiaries as well as spoilers of the roads were the local residents themselves. This principle, that local people were liable for road upkeep, remained a basic tenet of Japan's road administration all the way into the postwar period as Japan entered the era of motorization.

Despite the allocation of the vehicle tax and other fixed sums, road improvement soon ran up against the problem of insufficient funds. In September 1872, some of the money, grain and land set aside by the former village assemblies for emergency relief since the Edo period was taken over to support the construction work. A total of 618,196 ryō, 2 bu, 3 shu of gold, 3,383 dollars and 10 cents in nickel silver, 633,652 mon in coin, 39,561 koku of unhulled rice, 572 koku of unmilled rice, land in 1,705 locations, and 15 storehouses was handed over to the Repair and Maintenance Board, newly established under the Tokyo prefectural govern-

ment for work on roads and bridges. Wealthy leaders of the prominent Mitsui, Ono, and Shimada merchant houses were appointed to the posts of president and manager of the new agency.

The decision to appropriate relief funds rather than to impose a new tax for road repair was based on the judgement of the Tokyo prefectural authorities that it would be impossible to impose a new tax so soon after the Meiji Restoration. Nevertheless, the diversion of relief funds must have put an enormous strain on the affected localities. Even these funds, however, could not cover for very long the continuing expenses for road improvement and repair. In February 1879, the Tokyo prefectural government complained of the drain of funds to the Ministry of Home Affairs and petitioned to have the responsibility for funding repair on national roads, which converged at Nihonbashi from four directions (the Tōkaidō, Tōsandō, Kōshū and Rikuu highways), transferred to the national treasury. The ministry rejected the petition on the grounds that government expenditures were already under great strain. Moreover, the national government launched a deflation of paper currency in 1880 and cut off funds to local governments for public works in fiscal 1881. From that time on local financial burdens became increasingly greater.

A breakdown of road maintenance expenditures in Tokyo from 1877 to 1889 is shown in Table 8. As these figures show, the national treasury bore an average of only 3.3 percent of road upkeep costs during this period, despite the fact that the improved roads included considerable portions of national highways as well as local roads. As Table 9 shows in closer detail, from 1878 to 1882, 14 percent of the total surface area of newly built and improved roads in the Tokyo area was national roads, although the proportion of expenses borne by the national treasury was only 3.4 percent. This confirms statistically the fact that local entities paid a considerable portion of the cost of upkeep for the national roads.

The construction and repair of bridges, while less onerous than the burden of roads, was also left to local governments. As Table 10 shows, the national treasury paid an average of 26.5 percent of the expenses for building bridges in Tokyo and the vicinity from 1877 to 1889. The remain-

ing 73.5 percent was borne by the municipality, by towns and villages, and through contributions, again showing that the accumulation of social capital was largely left to the local level.

TABLE 8. Expenses for Road Construction and Improvement Work in Tokyo

	Government expenses	Pref. expenses	towns & villages	Total	Government share of expenses
1877	6,268	109,983		116,251	5.4 %
1878	920	79,230	3,104	83,254	1.1
1879	2,125	78,034	3,754	83,913	2.5
1880	4,219	35,745	5,677	45,641	9.3
1881	366	68,708	5,932	75,006	0.5
1882	6,348	114,228	5,866	126,442	5.0
1883	3,541	100,526	6,764	110,831	3.2
1884	3,219	73,304	4,179	80,702	4.0
1885	1,402	63,703	6,741	71,846	1.9
1886	2,854	90,121	8,528	101,503	2.8
1887	2,638	84,512	9,692	96,842	2.7
1888	2,543	79,554	8,579	90,676	2.8
1889	2,195	43,143	50,830	96,168	2.3
Total	38,638	1,140,437		1,179,075	3.3

Source: Compiled from Tokyo Prefectural Government Statistics.

TABLE 9. Breakdown of Expenses for Construction and Repair of Roads in Tokyo Prefecture

		Number of tsubo of newly constructed and improved roads *							
		National roads	Prefectural roads	Town and Village roads	Total	Gov. expenses	Municipal expenses	Town and Village expenses	Total
1878	Real number	37,985	24,258	320,747	382,990	920	79,230	3,104	83,254
	%	9.9	6.3	83.8	100	1.1	95.2	3.7	100
1879	Real number	86,312	50,037	384,313	520,662	2,125	78,034	3,754	83,913
	%	16.6	9.6	3.8	100	2.5	93.0	4.5	100
1880	Real number	40,454	32,577	366,869	439,900	4,219	35,745	5,677	45,641
	%	9.2	7.4	83.4	100	9.3	78.3	12.4	100
1881	Real number	77,853	35,573	438,655	552,081	366	68,708	5,932	75,006
	%	14.1	6.4	79.5	100	0.5	91.6	7.9	100
1882	Real number	106.752	62,047	435,725	604,524	6,348	114,228	5,866	126,442
	%	17.6	10.3	72.1	100	5.0	90.3	4.7	100
Total	Real number	349,356	204,492	1,946,309	2,500,157	13,978	375,945	24,333	414,256
	%	14.0	8.2	77.8	100	3.4	90.7	5.9	100

Source: Compiled from Tokyo Prefectural Government Statistics

* 1 tsubo = 3.3 m^2

TABLE 10. Share of Expenses for Construction and Improvement of Bridges in Tokyo Prefecture

	Shares of expenses							
	No. of tsubo	Gov. expenses	Pref. expenses	Towns and Villages	Subsidies	Private expenses	Total	Ratio of Government expenses
		yen		yen			yen	%
1877 *	207	7,507	2,293		-	-	9,760	43.0
1877 **	1,986	4,699	13,922		-	-	18,621	
1878 *	464	9,385	11,958	350	a 700	20,185	50,042	26.2
1878 **	?	3,028	4,436			0		
1879 *	564	2,234	8,453	350	a 378	6,579	22,144	13.3
1879 **	?	323	3,667			0		
1880 *	519	657	34,309	1,078	a 1,035	52	40,994	4.5
1880 **	?	154	3,709			0		
1881 *	225	0	7,069	455	b 830	4,809	22,582	0.0
1881 **	?	0	9,419			0		
1882 *	357	1,705	3,601	793	b 956	23,038	43.986	8.1
1882 **	?	1,845	11,843			205		
1883 *		21,095	14,977	1,579	-	-	37,651	4215
1883 **		413	11,018	1,487	-	-	12,918	
1884 *		82,978	14,859	782	-	40	98,659	74.9
1884 **		1,030	10,910	1,188	-	400	13,528	
1885 *		466	21,270	641	-	32	22,410	8.0
1885 **		3,408	21,688	843	-	-	25,939	
1886 *	472	824	46,488	30,794	-	-	78,106	1.8
1886 **	3,101	759	7,397	770	-	-	8,926	
1887 *	337	-	8,651	1,680	-	222	10,553	2.3
1887 **	7,598	472	8,791	714	-	16	9,993	
1888 *	2,383	9,712	10,597	914	-	784	22,007	33.8
1888 **	29,494	534	7,120	598	-	22	8,274	
1889 *	865	2,491	4,057	15,193	-	108	21,849	8.8
1889 **	2,760	238	3,413	5,664	-	4	9,319	
Total		155,957		432,304			588,261	26.5

Source: Compiled from Tokyo Prefectural Government Statistics.

Note: * New construction or replacement of bridges
** Improvement of bridges
a. national government
b. municipal government

IV. THE DEVELOPMENT OF RAILROADS AND THE DECLINE OF LONG-DISTANCE HIGHWAY TRANSPORTATION

The abolition in the mid-1870s of Japan's feudalistic transport system and the beginnings of industrialization in the late 1870s led to a spurt of activity in road transportation, beginning in the early 1880s. The number of vehicles on the roads rapidly increased both within and between cities. Medium-distance horse-drawn carriage transport service was instituted between Tokyo and the cities of Takasaki, Utsunomiya and Hachiōji. Express transportation, employing various types of vehicles, linked Tokyo with Osaka and Fukushima. The increasing numbers of jinrikisha and omnibuses in the cities and suburbs stimulated the continuing construction of new roads and improvement of old roads.

Nevertheless, the rapid development of road transportation networks that began in the 1880s could not be sustained, for road vehicles were rapidly eclipsed by the railroads. Construction work on a railroad between Tokyo and Kyoto, long delayed because the policy that railroads should be government-built and operated severely limited funds, finally began in 1884, using capital raised from public bonds of the Nakasen Railroad. The route was changed so that it followed along the Tōkaidō rather than the Nakasendō in 1886. The railroad was completed in July 1889, from Shinbashi to Kobe.

Other railroads followed quickly. Construction on the Yokosuka line, linking Shinbashi, Ōfuna and Yokosuka, began at the request of the military in the fall of 1887; it was completed in June 1889. During the same period, the government continued to relax its earlier policy against private ownership of railroads, primarily because fiscal retrenchment and paper currency reforms meant that the government itself could not afford to monopolize the railroad business. It granted licenses to open railroads to

the Nippon, Hankai, Iyo, Ryōmō, and Mito railway companies. As a result, new railroads opened between Ueno and Takasaki in May 1884; between Takasaki and Sendai in December 1887, between Oyama and Mito in January 1889, between Shinjuku and Hachiōji in August 1889, between Oyama and Maebashi in November 1889, and between Sendai and Aomori in September 1891. This very rapid proliferation of railroads took place before the full development of horse-drawn vehicles.

The first effects of road transport were felt along and near the railroads. The following comment on the ferry business in Hiro, a post town on the Kōshū highway, is illustrative: "As the number of carts, horses and passengers rapidly decreased since the opening of the Kōbu line, earnings were less than half the previous level." (Amano House Documents, Hino City). Fuchū, the station next to Hino, faced a similar problem: "Since the Kōbu line opened and the Kawagoe line was constructed, the earlier volume of traffic on the national roads declined abruptly." (Historical Documents of Fuchū City.) The disastrous effect of railroads on former post towns was already evident in June 1872, when Japan's first railroad damaged the economy of Shinagawa, previously a post town on the Tōkaidō. Similar results occurred elsewhere as railroad lines were extended. Honpō tetsudō no shakai oyobi keizai ni oyoboshitaru eikyō [The Impact of the Japanese Railroads on Society and Economy] compiled by the Tetsudōin (Board of Railways) and published in 1916, stated that the population of most of the former Tōkaidō highway post towns remained stagnant from the opening of the Tōkaidō line through 1913.

Although medium-and long-distance road transport rapidly disappeared along railroad routes, a new transport market developed to link railroad stations to surroundings areas. Vehicles used for this purpose generally carried goods for railway shipment and railway passengers. Thus the stage coaches that once ran between highway stations were replaced by the omnibus running between a single station and its hinterland, and relay transportation agents were replaced by collection and delivery agents, who set up successful business in front of the railway stations. The new transportation system, a combination of long-distance railway transport and subsidiary road transport, was rapidly instituted throughout the nation as railway lines were

extended. For this reason the governmental agency which had been in charge of long-distance highway transportation since the Meiji Restoration was abolished in March 1887. The Domestic Transport Company, which had enjoyed generous government subsidies since its founding in 1872, drastically reorganized its highway relay stations in May 1893, and proceeded to carry out a thorough internal reorganization, transforming itself into an enterprise engaged in collection and delivery of railway goods. This shift signalled the death of the long-distance road transportation business.

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