

# **Roads, Bridges, Tunnels and Empire: Highway Construction and the Great East Asian Co-Prosperity Sphere**

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## **Introduction**

From the 1920s, the automobile was everywhere the symbol of wealth and power. It initiated an era of highway and bridge construction among economically advanced nations, including Japan. Spurred on by a Good Roads Movement, the United States enacted legislation in 1921 that led to the construction of a national network of arterial highways. By the late 1930s, American highway planners were thinking international; in 1937 construction began on the Pan-American Highway to North and South America. The German Autobahn, begun in 1933, was another early example of a network of highways and expressways that were to become a fundamental element of the world's built environment. The German highway system, under Hitler, also had strategic implications, designed specifically to incorporate Austria with in the Germany transportation network. Japan's military and economic leaders were inspired by these models; not only did they put people to work, but they had significant economic and military advantages. Above all they served to integrate growing empires. A plan drawn up by the Japanese government in 1938 envisioned a 5,490 km highway that would stretch from Aomori in the north to Shimonoseki in the south, as well as link Japan by tunnel with Korea, Manchukuo, China, and Indo-China. The Japan section of the highway was to be completed by 1940 as part of the festivities to commemorate the 2,600<sup>th</sup> anniversary of the founding of the empire; the Great East Asian Highway was scheduled for completion in 1943. The outbreak of the Pacific War on December 8, 1941, brought the project to an end, but some construction on the mammoth project took place within Japan, Korea, and Manchuria. This paper will examine highway construction projects in interwar and wartime Japan and its empire, including the Dalian-Harbin Highway, the first long-distance highway built especially for automobile traffic on the Asian mainland. The conclusion of the paper will look at the legacy of these early dreams of unfettered mobility and international linkages.

## **The Automobile comes to Japan**

The twentieth century is the age of the automobile. Mass production and ownership of automobiles helped to bring about a revolution in personal mobility. The development of a distinctive car culture and car-centered landscape in the United States is well known.<sup>1)</sup> Japan was slow to join the revolution in automobility.<sup>2)</sup> In 1909, a total of sixty-one automobiles were registered with the Japanese police, near-

ly all owned by members of the aristocracy and business elite. Gradually their number increased. In 1920, Japan's automobile census revealed only 7,912 cars and trucks in the entire country (of which 2,695 were in Tokyo; in the United States the number was 9.2 million).<sup>3)</sup> Nonetheless, by the 1920s, Japan's streets, roads and bridges were dominated by a chaotic mix of pedestrians, bicycles, ox carts, horse-drawn carts and coaches, rickshaws and pushcarts, and a growing number of passenger cars, buses and trucks.<sup>4)</sup> And while numbers were small, the environmental and economic consequences of this emerging car culture were great, serving to initiate an "age of construction" in the years before the 1923 Great Kanto Earthquake.

In 1918, plans were underway to build new national highways in Tokyo and Osaka. In 1920, the Home Ministry, envisioning Japan in the year 1950, issued a 30 year plan involving the paving of prefectural and national roads, the construction of new highways designed specifically for automobile traffic, the construction of permanent bridges, river embankments, dykes, and dams. By the end of fiscal year 1925, some 8,228 km of national roads, 93,094 km of prefectural roads, 17,648 km of municipal roads, and 920,220 km of town and village roads had been completed at a cost of 126 million yen.<sup>5)</sup>

The construction of the Keihin Highway (National Highway 1; now National Highway 15) between Tokyo and Yokohama featured the Rokugō Bridge across the Tama River as its centerpiece and provided a model for a future national road system.<sup>6)</sup> The width of the two-lane concrete and asphalt road varied between 18 and 27 meters, allowing cars and larger trucks to pass safely; pull over areas were also created to improve safety. Careful attention was paid to gradient and camber, allowing rainwater to run off into covered culverts. Trees and other vegetation were planted on both sides of the road in the interests of beautification. (Figure 1)

The Rokugō Bridge (Figure 2) was literally central to the project, at mid-point between the Tokyo and Kanagawa sections of the 27 km highway. Design of the new bridge was entrusted to Masuda Jun 増田淳 (1883–1947), a civil engineer with extensive experience in the United States, became Japan's master bridge builder in the 1920s and 1930s.<sup>7)</sup>

The bridge design called for a 135.3 meter tied arch span bridge (each span 67.655 m) over the actual river channel on the Kanagawa side and a 310.9 m girder bridge supported by 17 piers over the floodplain on the Tokyo side. The roadbed was 16.4 m wide and consisted of reinforced concrete paved with asphalt, thus insuring ample space for motorized traffic, including large trucks.<sup>8)</sup> Work was interrupted by the Great Kantō Earthquake in 1923 and flooding from typhoons that hit the Kantō area weeks after the earthquake, but construction proceeded smoothly thereafter, reaching completion in June 1925. The total cost was reported at 3.5 million yen. In celebrations marking the opening of the new bridge, Kanagawa Governor Seino Chōtarō (1869–1926) praised the bridge as meeting the transportation needs of the new age. "Thanks to the beneficence of the government, we are blessed with a new bridge and a new highway without peer in Asia."<sup>9)</sup>

### **The Great East Asian Highway: Dreams and Realities**

Automobile ownership grew spectacularly in the interwar years, from just under



Figure 1: The Keihin Highway as seen from Shinagawa Tennōsha Shrine  
(Author's collection)

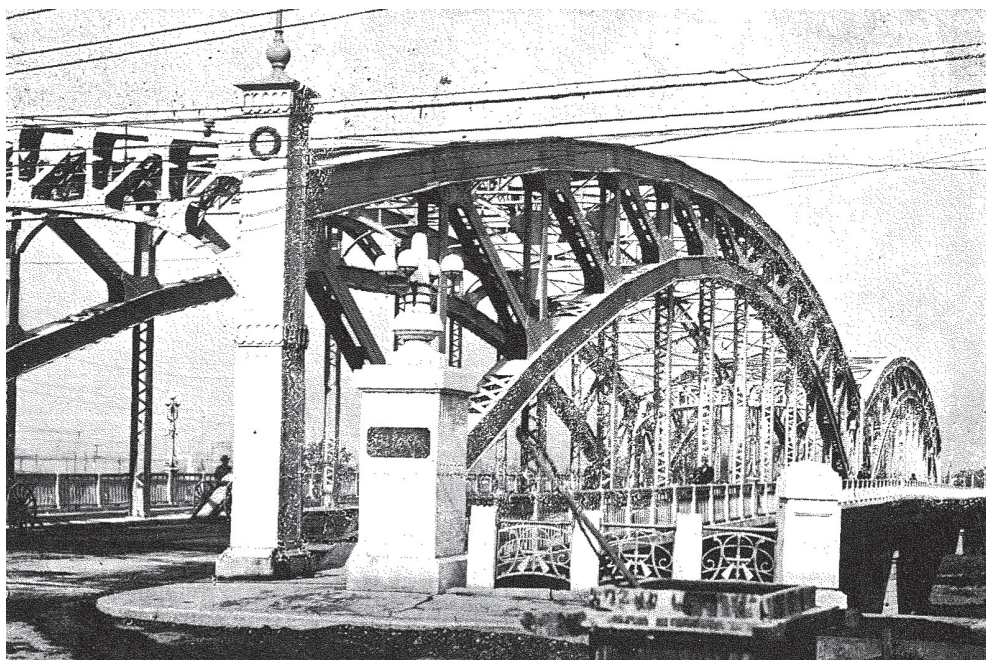


Figure 2: View of Completed Rokugō Bridge  
Source: *Doboku kensetsu kōji gahō* 土木建設工事画報, 2.1 (January 1926).

8,000 in 1920 to 66,306 automobiles in 1927, reaching a peak in 1938 at 221,162 before declining in the war years. But road construction failed to keep pace; only the Keihin National Highway and its Kansai equivalent, the 26.8 km Hanshin National Road (National Highway 2) completed in 1928, linking Osaka with Nishinomiya, were built specifically with automobile traffic in mind.<sup>10)</sup> By 1940, only about 1.8 percent of all roads were paved; the national highway system was somewhat better at 18.3 percent but that amounted to only 1,600 km of pavement.<sup>11)</sup>

What happened? There are several reasons, but perhaps the most important was the growing power of the military and priorities placed on empire building. During the depression years of the 1930s, the United States devoted more than one-third of all work-for-relief jobs to road and highway projects. In Japan, the government turned to military spending and the task of “constructing East Asia” (*Tōa kensetsu*) as a means to stimulate the economy.

In the early 1930s, arguments were made, particularly in the Home Ministry (Naimushō), to establish a national network of motorways to complement Japan’s extensive national rail system. As highway engineer Katahara Nobutaka noted, while good roads were a measure of modernity, sadly Japan’s roads were anything but good.<sup>12)</sup> Urban planners and military men alike were especially fascinated by Hitler’s autobahn. As Inoue Hiromichi, a Home Ministry engineer, put it, “Not only would such highways stimulate the economy but would serve to invigorate national unity and strength, consolidate national defense, and demonstrate the nation’s commitment to progress and civilization.”<sup>13)</sup> He went on to praise Hitler’s farsighted road building policy and urged completion of the Great East Asian Highway as the first step toward the integration of an Asian bloc centered on Japan.<sup>14)</sup> Around the same time, a Railroad Ministry official drew the obvious conclusion: “Just as all roads led to Rome in the past, now in East Asia all roads must lead to Tokyo, Shin-kyo, and Nanjing. And the distance between these three capitals must be shortened. It is no longer a fantasy or old dream to turn the Sea of Japan into a lake, and to make the Yellow Sea and East China Sea into inland waters. These are the issues to be realized with the joint forces of Japan, Manchukuo, and China.”<sup>15)</sup>

Despite arguments on behalf of highway construction, Japanese bureaucrats and military men placed priority on improving railway traffic in Taiwan, Korean, and after 1932, in Manchukuo. The *Asia Express*, built and operated by the South Manchuria Railways between 1934 and 1943, capable of reaching speeds up to 140 km/h, served as symbol of Japan’s commitment to technology and modernity.<sup>16)</sup> It was only in the late 1930s, after the out-break of war with China in July 1937 and the enactment of Japan’s national mobilization law in the 1938, placing the entire country on a war footing, that initial plans were drawn up for a imperial network of automobile highways.

Soon after plans were announced for the construction of new lines of super-express trains (shinkansen, known popularly as *dangan ressha* or bullet trains) that would link Tokyo with Shimonoseki, and from then by undersea tunnel to Korea and Manchuria and other parts of Asia and South-east Asia, a parallel project to build a “bullet highway” (*dangan dōro*) was announced.<sup>17)</sup> Both plans were conceived as monumental projects to commemorate the 2,600<sup>th</sup> year of imperial rule in 1940.<sup>18)</sup>

The motorway plans were drawn up by Kishida Akira, a civil engineer and specialist on road construction in the Home Ministry and two subordinates, Takano Tsutomu and Kitahira Nobutaka.<sup>19)</sup>

The plan, known simply as the “Recommendation of the Home’s Ministry Research Group on the Reform of Major Roads” (Juyō Dōro Seibi Chōsa-ka), envisioned a network of roads that would integrate Japan and its empire.<sup>20)</sup> Taking the German Autobahn as a model, from Hokkaido two trunk roads (*kansen*) would proceed south along the eastern and western coast of Honshu, joining at Shimonoseki in the south and with an extension to through to Fukuoka in Kyushu. At several points east-west highways would connect with the north-south trunk roads.<sup>21)</sup> In seeking to bring about a “revolution in mobility,” Home Ministry engineers designed the road to allow speeds up to 100 km/h so that a trip between Tokyo and Osaka would require five hours and between Tokyo and Fukuoka, 11 hours. The road would be around 20m wide; each side, consisting of two lanes, would be 7.5m wide separated by a 2m wide green divider. At some points the highway would be elevated on concrete pillars. Access would be restricted to motor vehicles with entrances and exits at regular intervals; through traffic would be unhindered by cross-roads or rail crossings; parking, refueling, and rest areas would be created along the route.<sup>22)</sup>

And like the German autobahn that served to unite the Third Reich with roads into Austria and Poland, Japanese planners envisioned automobile links with Asia. From Shimonoseki the new highway would proceed by tunnel and bridge to Pusan on the Korean peninsula.<sup>23)</sup> The highway would then head north to Changchun, the capital city of Manchukuo, and another highway south, through China, to Malaysia and Singapore with links to Thailand, Burma and India. The Great East Asian Highway, on the one hand, would serve to bring together the member of the Great East Asia Co-Prosperity Sphere; but it would also establish land links between Japan, Asia, and through Russia to Europe.<sup>24)</sup>

Needless to say, while the project excited people’s imagination, the worsening war situation meant that much of the plan remained on paper. Nonetheless, some work was begun on a new limited-access highway linking Tokyo with Kobe, laying the foundations of what would become the Tōmei and Meishin expressways in the post-war years. Moreover, feasibility studies were carried out on the tunnel to link Japan with Korea via Tsushima. The plan was to build a railway under the Chosen Strait, between Karatsu in northern Kyushu and Pusan. The link would be 198 km in length, of which 139 km would run under the seas, the rest running overland on Iki and Tsushima Islands.<sup>25)</sup> An earlier part of this project, the Kanmon tunnel, a 3.5 km link between the islands of Honshu and Kyushu (between Shimonoseki and Kita Kyushu), was completed in 1942; at that time the world’s longest undersea tunnel. The *Asahi shinbun* gave headlines to this triumph: “Today Historic Tunnel Opening—Sing Loud in Praise ‘Engineering Japan.’”<sup>26)</sup>

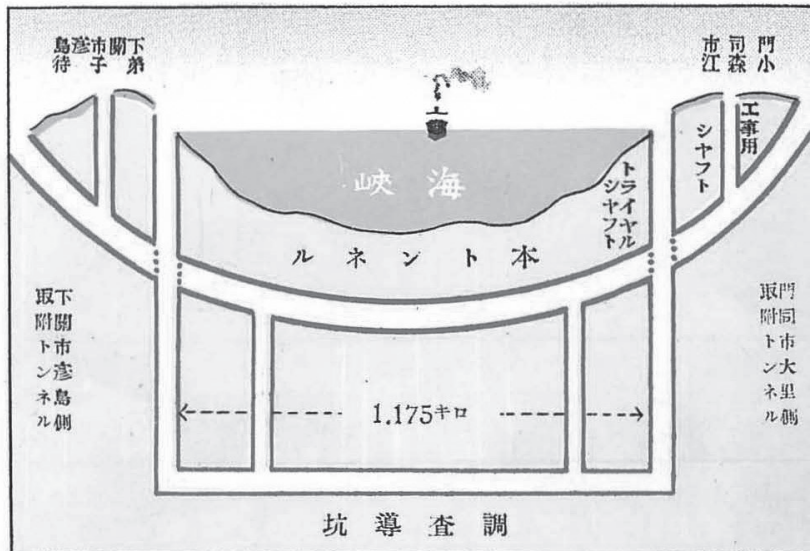
Another major wartime project was the Yalu River Bridge, on the border between China and North Korea and known now as the Sino-Korean Friendship Bridge, but built originally for rail and automobile traffic as part of plans to erase barriers dividing the Great East Asian Co-prosperity Sphere. Construction was begun in 1937

# WONDER OF THE WORLD

矜の本日進躍

## 圖略 程工ルネント底海 門關

面 斷 縱



### 解 說

序 久しく待望の海底トンネル大工事は躍進日本をシンボルして豪華の幕は開かれた正に是れ世界驚異の的

工費 總額千六百十二萬圓（外電化設備費大停車費等巨額—省略）

竣工 昭和十六年七月の豫定（向五ヶ年間）

全長 海底一・一七五キロ 兩取附一・九〇〇キロ計三・〇七五キロ

工程 初め調査導坑を作り次で工所用シャフトを掘りて本トンネルを調査導坑の上部に掘鑿する

調査導坑 圖の如く弟子待と小森江に直徑三メートル深四六メートルのシャフト（鑿坑）を掘り兩シャフトの底部から調査導坑を連結する此の豆トンネル（人間の通れる程度）は一種の試掘であるが將來本トンネルの排水坑等重要な關係を持つ

本トンネル 右完成後直に着工弟子待から千分の廿の勾配で海底を小森江に堀進む取附トンネル 次で彦島側堀越と門司側神田町の兩取附トンネル竣工にて全部完成掘鑿法 素掘・シールド工法等

使用人員 労働者延人員約三百萬人

昭和十一年六月十日  
下関要塞司令部許可濟禁複寫

Figure 3: The Kanmon Tunnel," Wonder of the World (postcard)  
(Author's Collection)

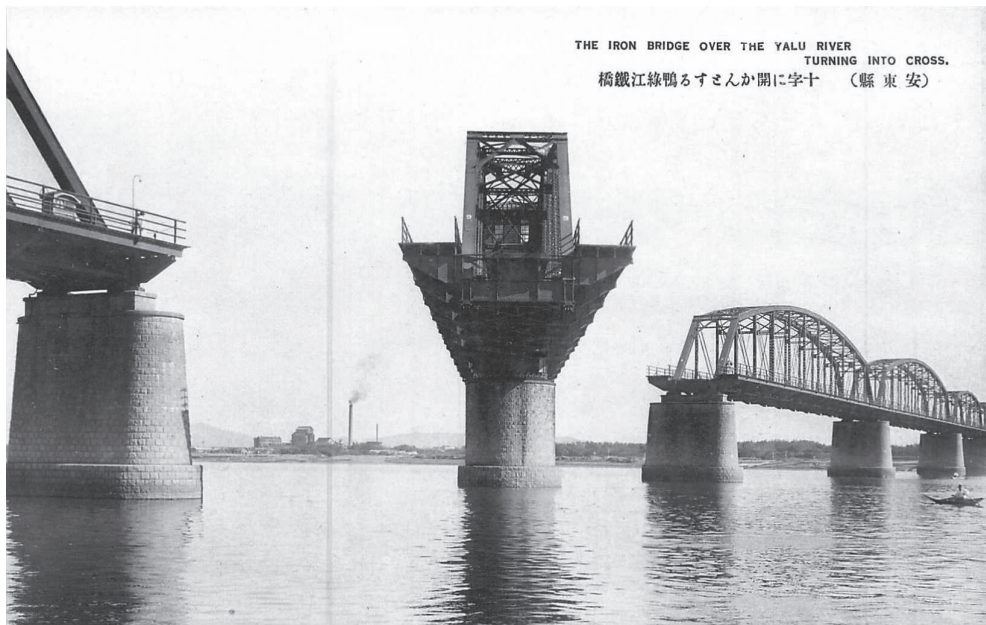


Figure 4: The Iron Bridge Over the Yalu River, Turning into Cross (postcard)  
(Author's Collection)

and completed in 1943.

In the 1930s and into the early 1940s, modern highway construction in Manchukuo proved more successful than projects in Japan proper.<sup>27)</sup> In 1933, one year after the birth of the puppet regime, an ambitious 10-year program of road building was announced, seeking to build over 40,000 km of new roads.<sup>28)</sup> The *Asahi shinbun* reported on November 28, 1933: “For Manchukuo, Development begins with Roads.”<sup>29)</sup> Thousands of idealistic engineers, most connected with the Home Ministry, flocked to Manchukuo to construct roads, railroads, canals, ports, water works, and communications networks. The refrain from the “Construction Song” (*kensetsu no uta*), made popular from the 1940 film, *Vow in the Desert* (*Nessa no chikai*), sums up this enthusiasm. “To our joyous voice in song—Shine, o golden clouds of the wasteland! It’s morning, it’s morning! Our song of construction is bursting forth across the continent.”<sup>30)</sup>

An optimistic report on the role the automobile could play to stimulate Manchukuo’s economic development appeared in the *Manshū Nippō* in 1934. It called for a radical transformation of the country’s road system and the construction autobahn-like speedways as well as determined efforts to secure new sources of fuel.<sup>31)</sup> As Louise Young noted, in the 1930s, Manchuria became a sort of haven for frustrated intellectuals, artists, and technocrats, fed up with outmoded infrastructure and the inconveniences of daily life. In Manchukuo they could realize their dreams; they sought to construct a type of modernity impossible within Japan itself.<sup>32)</sup> Young focused on railroad and urban construction programs, but the automobile and its roads and bridges and tunnels were equally part of the attempt to create a new East



Figure 5: Construction of the Road between Jilin and Changchun (Shinkyō)  
(Photograph Collection, Library of Japan Civil Engineering)



國道建設

Building State Highways.

滿洲國では早くも全國の國道建設に着手した。爾來工事は加速度的に進捗しつつあるが、國道の建設には河川の治水工事も含まれてゐる。

Figure 6: Building State Highways (Postcard).

The caption reads: “Manchukuo has quickly begun construction of state highways throughout the country. From now on, work will progress rapidly and road construction will include flood control work on rivers.” (Author’s collection)

Asian modernity.<sup>33)</sup>

Work began in 1934 on the construction of a national road system seeking to link all major cities in Manchukuo. By 1940, nearly 30,000 km of national and local roads (largely unpaved) had been built, despite the scarcity of motor vehicles to use them. Statistics from 1935 show one auto for every 4.4 persons in the United States, one for every 681 persons in Japan, and an astounding one auto for every 2,600 persons in Manchuria.<sup>34)</sup> These statistics were proof both of the need for immediate action (to increase the number of car and roads) and to emphasize the long-term importance of road building in Japan and throughout the empire. As Kaneko Masaki, high ranking civil engineer from the Home Ministry stationed in Manchukuo and author of a 1941 text on concrete road paving, explained: "A road is not simply a structure upon the land that facilitates travel between two points. Roads have a major influence on a country's military, political, economic and cultural existence. Therefore, road policy is of vital national importance ... it must be a plan that takes the next 100 years of our national life into account. Our country's historic mission is the construction of Greater East Asia." To achieve that goal and to maintain Japan's position as an "advanced national defense state" in times of war and peace, more roads and more automobiles were of absolute importance.<sup>35)</sup>

Plans to build a 1000 km paved autobahn-like expressway between Dalian and Harbin with Changchun in the middle were proposed by Oshima Hidenobu in April 1938. Later in June, Oshima attended the Eighth International Road Congress in The Hague and carried out an inspection of German expressways. In the spring of 1939, an office was set up in Muken to begin survey work on the Harbin-Dalian Highway; Oshima Hidenobu was placed in charge and later published an article on the project in the Home Ministry's civil engineering journal, *Kensetsu*.<sup>36)</sup> In August, at the first planning meeting, one of the Japanese engineers, Sakata Shizuo, recommended paving the highway with cement in order to allow speeds up to 200 km/h in level stretches. He urged completion of the highway in 1943, thereby fulfilling the goals of the 10-year plan issued in 1933. Another technician, Oshii Yoshio, urged integration of the Harbin-Dalian Highway into the Ministry's Great East Asia Highway project, nothing that both plans drew inspiration from the German autobahn. Budgetary concerns delayed the project, but in 1941, recast as a highway necessary for national security, the road was given the green light. Under the supervision of Seto Masaaki, construction of Asia's first modern highway began in 1942.<sup>37)</sup> Its designers envisioned a super modern highway, a *kōsoku dōro* (expressway), limited access only to motor vehicles, and built to allow for speeds up to 160 km/h in flat areas and 120 km/h in graded areas. The four-lane highway (the inside lane being the fast lane) would be divided by a 3m green space; a shoulder area and guardrails were planned for safety. Road signs and roadside lighting would also contribute to safety. The road would be as straight as possible to avoid blind spots and in any case allow for constant visibility of 150 meters ahead. The road would be kept free from flooding and inclines kept at a gradient at less than 6 percent. Overpasses would allow for unhindered through traffic and all modern conveniences of road travel would be available at regular intervals: rest stops, fuel and auto repair stations, and facilities for road repair and upkeep. Finally, landscaping would

enhance the beauty of the road environment.<sup>38)</sup>

In 1943, portions of the road were paved and several bridges and overpasses were completed, but construction came to a halt in 1944. The realities of war overpowered the idealism of the Japanese road builders. It would only be 45 years later, in 1990, that the Harbin-Dalian Expressway would finally be completed, becoming China's first modern automobile expressway.

## Conclusion

What is the legacy of these road, bridge, and tunnel projects? Historians look for origins. I find in these early days the kernel of what later, both in Japan and China, became a distinctive physical and mental car-centered or, to use Christopher Well's term, a car-dependent landscape. I also see in these idealistic plans for unfettered mobility and erasure of barriers, the as-yet unrealized quest for a world without borders—a true co-prosperity sphere.

In the postwar years, first Japan, and then China challenged American dominance in car manufacture and in road, bridge, and tunnel engineering and technology. In Japan, beginning in the late 1950s, construction began on a vast system of national expressways, national toll roads, and metropolitan expressways. Bridges and tunnels were built everywhere, transforming Japan into a “construction state.” Many of the engineers who worked on these postwar projects, including Kaneko Masaki, Kishida Akira, Sakata Shizuo, Oshima Hidenobu, Seto Masaaki, and Katahara Nobutaka, had their training in the prewar Home Ministry and in Manchuria and other of Japan's colonies where they given a relatively free hand to experiment with new construction materials and techniques. One example of the prewar origins of Japan's postwar highway system is Seto Masaaki's 1943 text on “The Design and Construction of Automobile Expressways” (*Jidōsha senyōdōro no sekkei*). It served as the Bible for Japan's postwar highway engineers.<sup>39)</sup>

The number of private automobiles in Japan expanded rapidly from 139,000 in 1955 to 1.7 million ten years later. By 1970, the number had more than quadrupled to 7.2 million. In 1973, although only 15 percent of Japanese roads were paved, nearly 13 million motorists were both enjoying the benefits and frustrations of the new “my car” culture.<sup>41</sup> Currently Japan has an automobile census of 76.1 million units (including cars and trucks) and is the third largest auto producer in the world with an annual production of 9.9 million automobiles (2012).<sup>40)</sup> The length and coverage of the Japan's expressway system has grown considerably over time; currently standing at 9,855 km and with expected growth (new highway construction projects will be undertaken as part of preparations for the 2020 Olympics) to 14,000 km. For better or worse, the automobile and the roads it runs on, have transformed Japan's economic, cultural, and physical landscape.

The transformation of China has been even more dramatic. The first expressway dedicated to automobile traffic was opened in 1990: the 1000 km Dalian-Harbin Expressway. At that time car ownership was a mere 5.4 million vehicles. Now the figure is over 120 million. Moreover, the past 25 years have witnessed rapid growth. China's current expressway system is 74,000 km in length, and expected to grow to 100,000 km in 2015 and surpass the United States, making China both the largest

producer of automobiles, the country with the largest ownership of passenger automobiles, and the country with the largest expressway system. It is also the country with the world's longest bridge; indeed, the three largest bridges in the world are all in China, including the recently completed (2011) Jiaozhou Bay Bridge, that links Beijing with Dalian and with the Dalian-Harbin expressway designed by Japanese engineers in the early 1940s.

Japan and China may never become a “car country” like the United States. And yet, transportation policy makers, civil engineers, urban planners, and construction firms in these two Asian countries have gradually carved out a place for the automobile in their respective built environments. From roads, bridges, tunnels, to parking lots, shopping malls, and mundane stop signs, the environment has been re-built with automobile traffic in mind. And mammoth construction projects will continue this transformation. In 2010 Japanese and Korean researches began plans for the construction of a 209 km undersea rail and automobile highway tunnel between the two countries. Prime Minister Hatoyama supported the mammoth project hoping it would serve as infrastructure for the creation of an East Asian Community similar to the EU, but critics in Korea and China criticized the tunnel as a neo-colonial project seeking to expand Japanese economic and political influence on the Asian Continent. The project has stalled, but it remains to be seen if the demand for easy movement of automobiles will overcome political differences and continue to reshape the national and inter-national landscape.

## Notes

- 1) For a recent work on this topic, see Christopher W. Wells, *Car Country: An Environmental History*, (Seattle: University of Washington Press, 2013). Instead of describing the various negative aspects of the automobile on the environment, of which there are many, Wells focuses on the evolution of the United States as car-dependent landscape. In addition to changing people's interactions with the environment, dependence on automobiles in turn required large-scale transformations of the natural world. See also Christopher Finch and Owen Gutfreund, *Twentieth-Century Sprawl: Highways and the Reshaping of the American Landscape*, (New York: Oxford University Press, 2004).
- 2) For an introductory text on the history of automobiles in Japan, see Saitō Toshihiko, *Kuruma-tachi no shakai-shi*, (Chūō Kōronsha, 1997). In English, see early sections of Michael Cusumano, *The Japanese Automobile Industry, Technology and Management in Nissan and Toyota*, Harvard East Asia Monographs, 1998. See also Yamamoto Hirofumi, ed., *Technological Innovation and the Development of Transportation in Japan*, (United Nations University Press, 1993).
- 3) For Japan, see Yamamoto, ed., 97; for the United States, see statistics on “Motor Vehicle Factory Sales and Registrations, and Motor-Fuel Usage, 1900-1957,” in United States Bureau of the Census, ed., *Historical Statistics of the United States, Colonial Times to 1957*, U.S. Department of Commerce, 1960, 462. The total number of automobiles and trucks registered in 1920 was 9,229,141.
- 4) See Yamamoto, ed., *Technological Innovation*, “Table 5. Total vehicles 1910–1939,” 97. The chart noted that between 1910 and 1930 the number of horse-drawn passenger carriages declined from 8,565 to 2,175, however the number of freight horse-drawn carriages increased from 158,590 to 308,914. Ox carts similarly rose in number from 35,448 to 98,690. The number of rickshaws declined from 149,567 to 42,635 whereas the number of bicycles rose rapidly from 239,474 to 5,779,297. The first reliable automobile census shows 873 passenger automobiles in 1915, growing to 57,827 in 1930.
- 5) Publications Committee, World Engineering Congress, *Industrial Japan: A Collection of Papers by Specialists on Various Branches of Industry in Japan*, Tokyo: International Publishing and Printing Co., 1929, 87.

- 6) See M. William Steele, "Across the Tama: Bridges and Roads, Rivers and Rocks," in Ts'ui-jung Liu, ed., *Local Realities and Environmental Changes in the History of East Asia* (London: Routledge), 2016, 181–204, for details on the construction of this highway and bridge.
- 7) There is only scant biographical information on Masuda Jun. See Fukui Jirō, "Kyōryō sekkei gijutsu-sha Masuda Jun no ashiato" (Souvenir of Jun Masuda, Great Bridge Designer), *Doboku kenkū ronbunshū*, vol. 23, 2004, 165–75. Available online: <http://library.jsce.or.jp/jsce/open/00044/2004/23-0165.pdf>. For a catalogue of the Masuda Jun papers, housed in the Tsukuba Research Institute of Civil Engineering, see: <http://library.jsce.or.jp/jsce/lib/committee/2006/draw/masuda/masuda.htm>
- 8) For construction details and photo montage of the Rokugō Bridge, see Takada Kei, "Keihin koku-dō Rokugō-hashī to Tsurumi-hashī" (The Rokugō Bridge, the Connecting Link in the New Tokyo Yokohama Road, Now Nearing Completion), *Doboku kensetsu kōji gahō* (An Illustrated Construction Review), 2.1 (January 1926), 31–34. Available online: [http://library.jsce.or.jp/Image\\_DB/mag/gaho/kenchikukouji/02-01/02-01-0229.pdf](http://library.jsce.or.jp/Image_DB/mag/gaho/kenchikukouji/02-01/02-01-0229.pdf)
- 9) For a comprehensive report on the opening ceremonies of the Kanagawa section of the new national highway, including transcripts of the congratulatory speeches, see: "Keihin kokudō Kanagawa-ken kannai kaichiku kōji shunkō shiki," in *Dōro no kairyō*, 7.8 (August 1925), 113–18. Available online: [http://library.jsce.or.jp/Image\\_DB/mag/dokai/pdf/07-08-0108.pdf](http://library.jsce.or.jp/Image_DB/mag/dokai/pdf/07-08-0108.pdf)
- 10) The 210 meter long bridge across the Muko River at midpoint between Osaka and Nishinomiya was also designed by Masuda Jun. For photo montage: <http://hardcandy.exblog.jp/4488394/>
- 11) See the section on prewar road pavement (*dōro hosō*) in *Dōro kōtsū seisaku-shi gaiyō*: <http://www.tai-kasha.com/doko/chapt11.htm>
- 12) Kitahira Nobutaka, *Meishin kōsoku dōro*, Daiyamondo-sha, 1965, 22.
- 13) Inoue Hiromichi, "Sekkyoku-teki dōro kokusaku no jūyōsei" (On the Need for A Positive National Road Policy), *Dōro no kairyō*, 22.7 (July 1940), 4. In 1940 alone, the *Dōro no kairyō* carried five other articles in praise of Nazi road policy.
- 14) Inoue, 13.
- 15) Quoted in Daquin Yang, "Japanese Colonial Infrastructure in Northeast Asia: Realities, Fantasies, Legacies," in Charles K. Armstrong, ed., *Korea at the Center: Dynamics of Regionalism in Northeast Asia*, M.E. Shape, 2006, 98. The phrase "all roads lead to Tokyo" appeared frequently in the writings of Home Ministry officials. For another example, see Iseki Masao, "Nanpō no dōro nit tsuite" (On Roads Leading South), *Doboku Manshū*, vol. 3, June, 1943, 19. "According to an ancient saying, 'all roads lead to Rome.' Now, as Japan builds the foundation of the Great East Asia Co-Prosperity Sphere, these words are a fitting embodiment of our transportation policy. Put in different words, the Great East Asia transport policy should always keep in mind that "all road lead to Tokyo."
- 16) See Louise Young, *Japan's Total Empire: Manchuria and the Culture of Wartime Imperial Japan*, (Berkeley: University of California Press, 1999), 247.
- 17) On the *dangan ressha*, See Barak Kushner, *The Thought War: Japanese Imperial Propaganda*, (Honolulu: University of Hawaii Press, 2006), 46. He referred to high-speed travel as a showcase for Japanese modernity.
- 18) See Tagawa Daikichirō, "2,600 nen no kinen shite" (In Commemoration of the Year 2600 [1940]), *Dōro no kairyō*, 22.3 (Month, 1940), 4–12.
- 19) Takebe Kenichi, *Michi no hanashi*, 1, Gihōdō Shuppan, 1992, 136–39.
- 20) See Matura Shigeki, "Senzen no dorō jigyō—sono seisakumen o chūshin ni," (A Study on the Road Works before the World War II—In Relation to the Policy of Road Works), *Doboku-shi kenkyū*, 18 (May 1995), 125–38. Available online: <http://library.jsce.or.jp/jsce/open/00044/1998/18-0123.pdf>
- 21) Takebe, 138.
- 22) Kaneko Masaki, "Jidōsha yusō to jidōsha narabi ni dōro," *Dai-ikkai tōa dōro gijutsu kaigi ronbunshū*, Tōa Dōro Gijutsu Kaigi Jimukyoku, 1943. 1943, 2.
- 23) "Yume naraba mezamezaramashito chōkōsoku jidōsha kokudō no keikaku" (If This is a Dream, Let's Not Wake Up: Plans for a National Automobile Expressway), *Dōro no kairyō*, 20.12 (December

- 1938), 138–40.
- 24) The text of the recommendations was published in “Jūyō dōro seibi chōsa jimu uchiawase-kai,” *Dōro no kairyō*, 22.7 (July 1940), 90–96. For a brief description of the plan, see Takebe Kenichi, *Michi no hanashi*, vol. 1, Gihōdō Shuppan, 1992, 135–139.
  - 25) the *Far East Yearbook*, 1941, 197.
  - 26) “Kyō rekishi-teki kantsū,” *Asahi shinbun*, May 31, 1942. Available online: [http://www.lib.kobe-u.ac.jp/das/jsp/ja/ContentViewM.jsp?METAID=00105421&TYPE=HTML\\_FILE&POS=1](http://www.lib.kobe-u.ac.jp/das/jsp/ja/ContentViewM.jsp?METAID=00105421&TYPE=HTML_FILE&POS=1)  
Earlier in July 1941 the *Asahi* published an article on the history of the Kanmon Tunnel: “Tonneru monogatari” (Tale of a Tunnel), *Asahi Shinbun*, July 10, 1941. Available online: [http://www.lib.kobe-u.ac.jp/das/jsp/ja/ContentViewM.jsp?METAID=00105376&TYPE=HTML\\_FILE&POS=1](http://www.lib.kobe-u.ac.jp/das/jsp/ja/ContentViewM.jsp?METAID=00105376&TYPE=HTML_FILE&POS=1)
  - 27) During the years between 1933 and 1939, the length of so-called “National Roads” (*kokudō*) increased from 8,146 km to 8,617 km. Prefectural roads (largely unpaved) grew from 99,257 to 114,466 km; during the same period, the number of National bridges increased from 8,115 to 8,348, Prefectural bridges from 89,289 to 93,573. the *Far East Year Book*, 1941, 200. In Manchukuo, during the period 1932 and 1938, a total of 13,080 km of national roads and 13,897 km of local roads were constructed, and a total of 21.618 km of bridgework was completed under the supervision of the Home Ministry. the *Far East Yearbook*, 1941, 788–89.
  - 28) According to the *Far East Yearbook*, 1941: “The Government’s initial plan in 1932 called for the construction of 60,000 km of national highways in ten years but various circumstances have necessitated slight modifications to this original project. The outcome was the formation of the First and Second Five-Year Highway Construction Plans. The first Five-Year Plan covered the years 1932–36 and involved the construction of 9,809 km of national highways and 20 special bridges at an estimated expenditure of ¥30,85,000, while the Second Five-Year Plan, extending over 1937–41, proposed the construction of 13,268 kilometers of national highways and 37 special bridges at an estimated expenditures of ¥62,000,000. ... During the period allotted to the First Five-Year Plan, 8,902 kilometers of modern highways and 20 special bridges had been completed, while during the first two years of the Second Five Year Project, 4,613 km of national highways and 24 special bridges had been successfully completed.” (788)
  - 29) “Manshūkoku kaihatsu wa dōro kara,” *Asahi shinbun*, November 28, 1933, morning edition, 2.
  - 30) Aaron Moore, *Constructing East Asia: Technology, Ideology and Empire in Japan’s Wartime era, 1931–1945*, (Stanford: Stanford University Press, 1993), 102–03. [http://www.academia.edu/2576912/Race\\_as\\_technology\\_and\\_blurred\\_national\\_boundaries\\_in\\_Japanese\\_imperialism\\_Nessa\\_no\\_chikai\\_Vow\\_in\\_the\\_Desert\\_1940\\_](http://www.academia.edu/2576912/Race_as_technology_and_blurred_national_boundaries_in_Japanese_imperialism_Nessa_no_chikai_Vow_in_the_Desert_1940_)
  - 31) Ueno Shō, “Kyūsokudō no hatten ura ni aru Manshū no jidōsha kōtsū” (“Automobiles will help bring about Manchukuo’s rapid development,” *Manshū nippō*, August 25–31, 1934. [http://www.lib.kobe-u.ac.jp/das/jsp/ja/ContentViewM.jsp?METAID=00105138&TYPE=IMAGE\\_FILE&POS=1](http://www.lib.kobe-u.ac.jp/das/jsp/ja/ContentViewM.jsp?METAID=00105138&TYPE=IMAGE_FILE&POS=1)
  - 32) Louise Young, *Japan’s Total Empire: Manchuria and the Culture of Wartime Imperialism*, see especially Chapter 6, “Brave New Empire,” 241. See also Anke Scherer, “The Colonial Appropriation of Public Space: Architecture and City Planning in Japanese-dominated Manchuria,” in Christoph Bruman and Evelyn Schultz, eds., *Urban Spaces in Japan: Cultural and Social Perspectives*, Routledge, 2012, 37–52.
  - 33) Aaron Moore, *Constructing East Asia* describes this exodus from a different angle: “Under the banner of “constructing East Asia” (*Tōa kensetsu*), several thousand idealist engineers flocked to Korea, Taiwan, Manchukuo, and China primarily during the 1930s to construct roads, canals, ports, dams, cities, irrigation, sewage and water works, and electrical and communications networks.” He examines the thought (“imagineering”) behind flood control projects, urban planning, and the construction of dams (engineering) to show the constant relationship between technology and power and examine important continuities with postwar Japan. Another work that shows how technology was used to buttress Japan’s imperial ambitions is Daqing Yang, *Technology of Empire: Telecommunications and Japanese Expansion in Asia, 1883–1945*, Harvard East Asian Monographs, (Cambridge: Harvard University Asia Center, 2010). Instead of road, bridge and tunnel construction, Yang focuses on telegraph, telephone, cables, wireless, and radio communications as a means to integrate empire. Chapter 5 “Envisioning Imperial Integration,” describes the construc-

tion of the Japan-Manchukuo cable in 1936, 3,300 km in length, that allowed instant communications between Tokyo and Shinkyō. (167–68) This project served as the basis for East Asian cable communications network implemented in 1938. By 1940, at the same time that Home Ministry engineers were making plans for a Great East Asian highway, the Konoe Cabinet called for a “giant leap forward” to strengthen transportation and communications between Japan, Manchukuo, and China “in order to promote integration of the economies of the three countries and meet the demands of national defense.” (203–04). Finally, the take-off of Japan passenger aviation industry in the late 1930s may also be seen within this context. According to the *Far East Yearbook*, 1941: “Since 1933 much progress has been made in developing the commercial air routes of Manchukuo and good connections with the air service system of Japan are in effect. The capitals of Japan and Manchukuo have been shorted into a day’s trip by air since 1937. When the projected direct flights over the Japan Sea are realized the distance between Hsinking and Tokyo will be further shortened by several hours.” (798) An “Air Route Map of Japan, Manchukuo and China” was included in the aviation section of the *Far East Yearbook*, 1941. For this image and information on travel and tourism in Japan and its colonies in 1940, see: Kenneth James Rouff, *Imperial Japan at its Zenith: The Wartime Celebrations of the Empire’s 2,600<sup>th</sup> Anniversary*, (Ithaca: Cornell University Press), 2010, 114.

- 34) Yamamoto Sōji, “Jidōsha hoyūryō ni kansuru ichi kōsatsu,” *Dai-ikkai tōa dōro gijutsu kaigi ronbun-shū*, 1943, 4–6. Yamamoto was the head of the Manshū Automobile Company and an early associate of Ayukawa Yoshisuke, the founder of what became Nissan Motors. Another set of statistics gives the number of vehicles in Manchukuo for the year 1936: bicycles, 104,852; rikisha, 24,739; wagons, 21,856; carts, 530,753; hand cars, 3,430; motorcycles, 261; passenger motor cars, 2,946; lorries, 2,333; other motor vehicles, 108; total motorized vehicles: 5,347. the *Far East Yearbook*, 1941, 792.
- 35) Kaneko Masaki, “Jidōsha yusō to jidōsha narabi ni dōro,” *Dai-ikkai tōa dōro gijutsu kaigi ronbun-shū*, 1942, 2.
- 36) For details on the origin and planning of the Harbin-Dalian Highway, see Hashimoto Masako, “Manshū-koku HaDai (Harbin-Dalian) dōro ni kansuru shi-teki kenkyū,” *Dobokushi kenkyū*, 33, 2013, 341–348. See also Furukawa Hiroki, *Shuto kōsoku dōro no nettowāku keisei no rekishi to keikaku shisō ni kansuru kenkyū*, 2008, 101–145 (privately printed, copy in Civil Engineering Library, Tokyo). For Oshima Hidenobu’s 1938 article: “Ha-Dai dōro nit tsuite,” *Kensetsu Manshū*, vol. 4, no. 10 (October, 1939), 11–23. Available online: [http://library.jsce.or.jp/Image\\_DB/mag/pre-manshu/pdf/031-04-10-004.pdf](http://library.jsce.or.jp/Image_DB/mag/pre-manshu/pdf/031-04-10-004.pdf). The article begins with the statement, “Transportation is civilization,” and concludes that the construction of the Harbin-Dalian Highway is essential for the achievement of Japan’s new order in Asia. The highway “will serve the interests of economic development and military defense and not only in the area between Harbin and Dairen. It will become a road of harmony and cooperation (*kyōwa dōro*) extending it benefits to the north, east, south, and west and in concert with the expansion of the rail network, contribute to the shining glory of the national defense state of Manchukuo.” (23).
- 37) For a contemporary account of developments, including behind-the-scenes negotiations, that led to construction of the Harbin-Dalian Highway, see Seto Masaaki, “Kōsoku jidōsha kokudō ga kensetsu sareru made,” *Dōro*, vol. 2, 1943, 15–19.
- 38) Oshima Hironobu, “Ha-Dai dōro ni tsuite,” *Kensetsu Manshū*, vol. 4, no. 10 (October, 1939), 12–13.
- 39) Seto Masaaki, *Jidōsha senyō dōro no sekkei*, Tokiwa Shobō, 1943. Seto was in residence as a civil engineer in Manchukuo assigned to road construction between 1938 and the end of the war. His book was comprehensive, dealing with technical and social problem of road construction including road surfaces, dividers, on and off ramps, bridges and underpasses, and the construction of parking areas, fueling and repair stations, and rest areas. For table of contents, see the Diet Library website: <http://webcatplus.nii.ac.jp/webcatplus/details/book/731365.html>. In 1941 he wrote a two part report on “decentralizing and centralizing” aspects of the German national highway system, available in the Civil Engineering Library, Tokyo. For further details, see the reference notes on Seto Masaaki prepared by the Civil Engineering Library, “Refarensu hōkokusho Seto Masaaki shi no keireki, shōsoku, izoku ni tsuite,” December 28, 2004.
- 40) “The Motor Industry of Japan: 2013,” report compiled by the Japan Automobile Manufacturers

Association; available online: <http://www.jama-english.jp/publications/MIJ2013.pdf>

