

## CHAPTER III PHYSICAL CHANGE IN BANGKOK, 1851-1932

**Abstract:** This chapter looks at the consolidation of Bangkok as a primate city in the 50 years after 1850. The main theme underlines how the transformation from "a floating city" to a "land-based city" occurred around 1900. We investigate the economic significance of road construction in Bangkok in terms of the growth of urbanized areas, the expansion of row houses, trade, business, and the technology of land transportation.

This chapter is divided into four parts: first, Bangkok's growth and the Bowring Treaty; second, the historical significance of transport development; third, road administration; and finally the economic consequences of road construction.

### I

#### Bangkok's Growth and the Bowring Treaty: An Overview

We can see how the contour of Bangkok's growth changed with the city's commercial relations. Already before 1850 there was a considerable change. Another burst of activity came from the 1880s, when trade, immigration and other forces combined to produce a remarkable era of change. This chronology leads us to question the influence of the Bowring Treaty.

By the 1850s, Bangkok was a city in transition, changing from a moat and fortified city into a large commercial city. Before 1851, Bangkok was mainly concentrated within the area of the city walls with the palace as its centre. After 1851, the year in which Rama IV (1851-1868) came to throne, there were gradual changes in the city landscape. After the Bowring Treaty was signed in 1855,<sup>1</sup> the growth of the city gradually accelerated. One of the most important aspects of the Treaty was that it allowed private business, mostly western and Chinese, to develop the economy, rather than the state monopoly involved in international trade. As a result, more westerners came to live in Bangkok and set up trading firms as well as a few industries. The

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<sup>1</sup>In 1855, the Bowring Treaty was concluded with Great Britain. It gave a number of concessions to the British on a scale never before given by the Siam to any foreign power. The important provisions were as follows: (1) the removal by Siam of a large range of trade restrictions, prohibition and monopolies; (2) the limitation of import duties to 3 % ad valorem, the articles of export being taxed just once, whether the taxes were called an inland tax, a transit duty or an export duty; (3) the right of British subjects to trade at all Siamese seaports and to reside in Bangkok; and (4) British subjects to be under the jurisdiction of a resident British Consul rather than under Siamese courts. Other countries, mostly western, soon followed the pattern set by the Bowring Treaty. The same concessions were given to the following nations: United States (1856), France (1856), Denmark (1856), Portugal (1859), Netherlands (1860), Germany (1862), Sweden (1868), Norway (1868), Belgium (1868), Italy (1868), Australia (1869), Hungary (1869), Spain (1870), Japan (1898), and Russia (1899).

growth of business generated demand for land for construction and some residential areas.<sup>2</sup>

The Bowring Treaty was a turning point in Bangkok's commercial history, although, as we will explain a little later, the significance of the treaty should not be exaggerated. Before 1855, Siam's foreign trade relied on traditional forest products and was very miscellaneous. Ingram, quoting Malloch, showed that of total exports in 1850, valued at 5.6 million Baht, more than half were forest products, about 15 percent was sugar and 3 percent was accounted for by pepper (rice did not appear at all in Siam's exports in 1850).<sup>3</sup> After 1855, Thailand became increasingly absorbed into the global economy (rather than in Asian regional trade) as a leading rice exporter.

The trade liberalisation of the Bowring Treaty influenced economic changes in Bangkok, because the development of Bangkok was tied to foreign trade. Bangkok handled virtually all the kingdom's exports and imports. Rice exports, which were 75 per cent of the value of total exports in the decade before 1914, grew from around 10,000 tons annually in the 1860s to around 500,000 tons in the 1890s and to over 1 million tons by the 1920s (Table 3.1).

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<sup>2</sup> The Treaty laid down:

British subjects are permitted to trade freely in all the sea ports of Siam, but may reside permanently only at Bangkok, or within the limited assigned by this Treaty. British subjects coming to reside at Bangkok may rent land, and buy or build houses, but cannot purchase lands within a circuit of 200 sen (not more than four miles English) from the city walls, until they shall have lived in Siam for ten years, or shall obtain a special authority from the Siamese Government to enable them to do so. But with the exception of this limitation, British residents in Siam may at anytime buy or rent houses, lands, or plantations, situated anywhere within a distance of twenty-four hours' journey from the city of Bangkok to be computed by the rate at which boats of the country can travel (Quoted from Article IV, Office of the Prime Minister, **File concerning Harry Parkes' Mission to Bangkok in 1856** from The Archives of the Ministry of Foreign Affairs, London, Bangkok: 1978, p. 266).

This clause in the Article IV in the treaty had its implication to Bangkok's development as follows. Bangkok became a mainstay of Westerners, chiefly, British who brought the penetration of western capital, ideas, and technology (predominantly British before 1914). A number of European houses were established in Bangkok; Borneo Company and D.K.Mason, both Singapore firms, opening offices in 1856. By the end of the 1850s American, French, and German Agency houses had established themselves, and some operated rice mills (Malcolm Falkus, "Early British Business in Thailand" in R.P.T. Davenport-Hines and G. Jones (ed.), **British Business in Asia Since 1860**, Cambridge: Cambridge University Press, 1989, pp. 128-129). In the 1870s onwards, some western business establishments were: Windsor (1870), Barow Brown (1871), Berli Jucker (1882), East Asiatic (1884), Anglo Siam (1886), Ellerman's Aracan Rice & Trading (1887) (Suehiro Akira, **Capital Accumulation and Industrial Development in Thailand**, Bangkok : Chulalongkorn University Social Research Institute, 1985, pp. 2-15). The existence of western communities had a number of consequences on Bangkok's development. The construction of Chareonkrung road (1861), for example, indicated their rising influence over Rama IV. Electricity and electric tramways to Bangkok were introduced in the 1880s by Danish naval officers and merchants.

<sup>3</sup>Cited in Ingram, Economic Change, p. 22.

**Table 3.1 Exports:Rice, 1857-1930, Five -Year Averages**

Year	Exports (' 000 tons)
1857	54
1859	45
1860-64	105
1865-69	99
1870-74	113
1875-79	213
1880-84	217
1885-89	322
1890-94	455
1895-99	521
1900-04	677
1905/06-09/10	892
1910/11-14/15	921
1915/16-19/20	955
1920/21-24/25	1, 077
1925/26-29/30	1, 403

Sources : Constance M.Wilson, **Thailand A Handbook of Historical Statistics**, Boston : G.K. Hall & Co,1983, pp. 212-214; and Suehiro Akira, **Capital Accumulation in Thailand,1855-1985**, Tokyo: The Centre for East Asian Cultural Studies ,1989, Table 2.4, p. 26.

By the 1870s, rice became Thailand's main export, and it retained its leading position until the 1970s. For most of this long period, rice constituted between two-thirds and three-quarters of total Thai exports; even in 1950 rice formed around one half of Thailand's exports. The only other significant exports were teak, tin and rubber (after 1922). Rice and teak formed together around 90 percent by value of Bangkok's export trade, whereas tin and rubber were exported principally from southern ports until the Second World War. The bulk of these rice exports was destined for Asian markets, with Hongkong and Singapore providing often the principal initial destinations. Trade of teak also grew rapidly after the 1880s, and saw-milling became a principal industry in Bangkok, much of it controlled by British and other European firms. Teak trees were cut in the northern forests, moved by elephants and floated down the creeks to the main river system, where they were assembled into rafts and sent down the Chaophraya river to Bangkok mills. The quantities exported were as follows: 1900, 45,261 tons; 1901, 43,735 tons; and 1902, 56,075 tons.<sup>4</sup>

Since Bangkok was the most important port in Thailand, foreign trade had a considerable impact upon economic activity concentrated in Bangkok. Shipping, warehouses, rice mills, saw mills all developed in step with foreign trade. Trade also brought capital, technology and labour to Bangkok. For example, the first steam rice

<sup>4</sup>Cecil A. Carter, **The Kingdom of Siam** 904, Bangkok: the Siam Society, 1988, p. 251.

mill was introduced in 1858 by an American Company called "American Steam Rice Mills".<sup>5</sup> Afterwards, there was an increase in investment for rice milling factories for exports. By 1879, there were 10 steam mills operating in Bangkok and the number increased to 23 mills in 1895 and 59 mills in 1910.<sup>6</sup> Rice mills demanded increasing labour, chiefly Chinese migrants.

How far can the growth of the rice trade be included as a factor in Bangkok growth? We may consider rice to be a "base industry" in term of current urban theory.<sup>7</sup> We can use some aspects of regional theory to explain Bangkok's growth. The expansion of the rice mills generated a large source of wage labour employment. Large-size mills each employed about 200 wage labourers and the smaller size mills employed about 100 wage labourers.<sup>8</sup> The production process involved a range of occupations, such as middlemen who linked Bangkok and the rice fields in the rural areas, skilled and unskilled labour such as rice carrier coolies, general coolies, engineers. The rice trade stimulated a stream of Chinese migrants to enter the country, concentrating in Bangkok (Chapter IV). We estimate the growing demand for labour in Table 3.2. Low base estimation is done by multiplying the number of rice mills by 150, and high base estimation by multiplying the number of rice mills by 250.

In 1858, there were around 1,500-250 labourers engaged in rice mills. By 1892, the number had expanded to 3,750-6,250, and by 1924 to 12,450-20,250. If the estimation covered the labourers engaged in saw mills, shipping, and some other exports businesses, undoubtedly, the export industries contributed a large portion of

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<sup>5</sup>Bangkok Calendar, Annually, 1868.

<sup>6</sup> Thaveesilp Subvattana, "Rice Production and Rice Trade in Central Thailand from the Reign of King Rama V to the Reign of King Rama VII", M.A. thesis, Chulalongkorn University, 1977, Table 5, pp. 223-224. A fuller discussion of how the Chinese control rice mills in Bangkok, see Thaveesilp *Ibid.*; Suehiro, Capital Accumulation in Thailand; and Skinner, Chinese Society.

<sup>7</sup>At present, there is no comprehensive general theory of regional growth. There are however, a number of partial theories and concepts which focus on one or more factors likely to influence regional growth. The sum of all of these factors in regional growth can be expressed thus: natural resources, labour, capital, investment, transport and communication facilities, technology, industrial composition, the size of the population, domestic or national market, export market, local and central government spending, socio-political system.

We may consider rice to be a "base industry" in terms of urban current theory to explain Bangkok's growth. The central framework is that some activities in a region are particularly "basic", in the sense that their growth "leads and determines the region's overall development", while other "non-basic" activities are simple consequences of that region's overall development. Hence, the usual economic base theory identifies basic activities as those which bring money from the outside world, generally by producing goods or services for exports (Hoover, An Introduction to Regional Economics, p. 219). This theory states that the growth of regions depends upon the growth of its export industries, implying that expansion in demand outside that region is the crucial determinant initiating growth within the region.

<sup>8</sup>N.A.R.6 M. of the Capital 31.3/48 (1919).

total employment in Bangkok during the period 1858-1930. In fact, the growth of Bangkok's population between the 1850s until the 1940s was heavily dependent on Chinese immigrants (Chapter IV).

**Table 3.2** Number of Workers Required in Rice Mills in Bangkok, 1858 - 1930

Year	Low Base Estimation	High Base Estimation
1858	150	250
1864	450	750
1880	1, 800	3, 000
1889	3, 450	5, 750
1892	3, 750	6, 250
1895	4, 050	6, 750
1896	4, 500	7, 500
1897	3, 900	6, 500
1898	5, 550	9, 250
1901	3, 900	6, 500
1908	6, 900	11, 500
1910	8, 850	14, 750
1919	9, 900	16, 500
1924	12, 450	20, 750
1925	12, 600	21, 000
1929	10, 650	17, 750
1930	10, 650	17, 750

Source: My calculation is based on Thaveesip Subvatana, "Rice Production and Rice Trade in Central Thailand from the Reign of King Rama V to the Reign of King Rama VII", M.A. thesis, Chulalongkorn University, 1977, Table 5, pp. 223-224.

### **The Bowring Treaty and Bangkok's development reconsidered**

We should not exaggerate the impact of the Bowring Treaty on Bangkok's development. As previously discussed (Chapter II), Chinese immigrants had already constituted a substantial component of labour supply in Bangkok. Bangkok had a significant involvement in international trade even before the imposition of free trade under the Bowring treaty in 1855. As trade expanded, Bangkok became the main centre of Chinese immigrants. Indeed, one of the most important factors boosting the development of Bangkok as a dominant city during the 1820s and 1830s was the influx of Chinese migrants to work in non-agricultural employment in Bangkok such as the construction of canals, temples, and palaces. The dynamic growth of Bangkok and the expansion of economic activity depended on Chinese labour. The finding of Chapter II supports earlier studies focusing on the economic basis of the Thai economy before the Bowring Treaty of 1855. There are many studies of pre-1855 Siam, both in Thai and

western languages.<sup>9</sup> Although few are directly concerned with the origins of Bangkok's primacy, a careful reading of the literature suggests that indeed there were a great many forces boosting Bangkok's development in this period. Especially in the 1820s and 1830s, Siam's "expansive" and "export-oriented" economy<sup>10</sup> led to development of the capital city.

Terwiel<sup>11</sup> has argued that significant changes were under way well before the mid-1850s, while the impact of the Treaty was limited.<sup>12</sup> He noted that "in the first place this essay has shown that many historians have failed to critically appraise Bowring's remarks on the Treaty he himself negotiated. The envoy's excessive claims seem to have been slavishly accepted. British imperialist bias seems to have blinded historians and to have prevented a judicious and balanced assessment of the economic effects of the treaty. A second reason why the treaty's economic effects have been misjudged is that most historians take 1850 as a base year from which to judge the performance of the Thai economy. It is argued here that between 1845 and 1855 the

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<sup>9</sup> For example, Nidhi Aeusriwong, **Bourgeoisie Culture and Literature of Early Bangkok**, Thai Khadi Research Institute, Thammasat University, 1982; Sarasin, Tribute and Profit; Cushman, "Fields from the Sea"; Hong, Thailand; Skinner, Chinese Society; and Hans-Dieter Evers, Rudiger Korff, Suparb Pas-ong, "Trade and State Formation; Siam in the Early Bangkok Period", **Modern Asian Studies**, Vol 21, Part IV, October, 1987, pp. 751-771.

<sup>10</sup> Terwiel, Through Travellers' Eyes, p. 236.

<sup>11</sup> Terwiel has noted:

Probably the most important factor for the economic boom during the 1820s and 1830s is the spectacular immigration of Chinese labour. It will never be exactly known how many tens of thousands of Chinese flocked to Bangkok and from there to the Thai countryside, drawn there by the climate of prosperity and the fact that the Siamese actively encouraged Chinese immigration. Directly associated with the influx of Chinese is the rapid increase in the number of sugar, pepper, tobacco, cotton and indigo plantations, the growth of the iron industry, the boat-building industry, and especially the increased export trade. It is an established fact that between 1809 and 1840 trade with China was booming. Siam's economic expansion between 1810 and 1840 affected the country in many ways. It stimulated the use of money throughout the countryside, it helped increase the size of the state's administration, it made possible to invest in expensive military expeditions, which in turn, boosted the size of the population. One of the most dramatic changes was, however, that in order to finance the increased administrative role of the central government that tax burden was expanded dramatically during the 1820s and 1830s. No less than 38 new types of taxes were introduced during the Third reign alone, affecting people at all levels of society. The economic "boom" between 1810 and 1840 needs to be understood in order to appreciate the effects of the recession of the 1840s. Again, various factors combined to cause a sudden and dramatic downturn in Siam's economy. In the first place, in 1842 China had lost the Opium War with Britain, and tribute trade declined. Between 1844 and 1851, King Rama III sent only a single mission to Peking. Then there were two years in succession, 1843/44 and 1844/45, when the rice crop failed in many provinces because of bad weather. A factor that seriously aggravated the situation was that the administration proved unable to adjust to the economic downturn. During the 1840s the Siamese government was particularly inward-looking and unable to respond effectively to the changed conditions. Instead of cutting its own expenditures and offering tax relief it mercilessly continued to impose its recently-introduced heavy tax burden upon a poverty-stricken farming population (Terwiel, "The Bowring Treaty", p. 42).

<sup>12</sup> Ibid., pp. 40-47.

Siamese economy had been in recession and that this has generally not been taken into account. For these two reasons a false picture of the economic effects of Bowring's Treaty has come to be accepted."<sup>13</sup> Falkus claimed: "These are points which any Thai study of Thai economic history must consider carefully, especially since they raise the more general issue of whether starting with the Bowring Treaty is to impose an inappropriate western perspective upon our view of the evolving Thai economy and to concentrate too much upon foreign trade and the international economy. Perhaps we should even ask whether the impact of rice exports upon the Thai economy as a whole has been over-emphasized."<sup>14</sup> Nidhi Aeusrivong has argued that in the early Bangkok period prior to 1855, a rapid expansion of an exchange-based economy stimulated the emergence of production for foreign trade, especially in the agricultural sector: "The production of agricultural goods for export can be regarded as the basis of the economy. As such the Thai economy can be defined as an exchange economy already a long time before the Bowring Treaty."<sup>5</sup>

As a test of the economic impact of the Bowring Treaty on Bangkok's trade, we can look at statistics of international rice trade. They indicate that the international rice trade developed on a large scale only from the 1870s (Table 3.1), and the really

<sup>13</sup>Terwiel argued that :

Most authors have followed J.C. Ingram who estimated the economic effects of the Bowring Treaty by taking the year 1850 as a base. Ingram depicts a rather " primitive" economy, with Siam's internal trade" probably carried on through barter entirely within the villages. Ingram apparently did not realize that in 1850 the country was still in the middle of a serious economic recession, and that if he had taken, say, 1830 as his base he would have obtained quite a different perspective. Many economic historians, however, have taken Ingram's statements on 1850 to refer to the whole of the early Bangkok period, and to make matters worse, they have elaborated upon the " barter economy" idea without taking note of the complex reality" ( Terwiel Through Travellers' Eyes, p. 43). Thus he argued that the characterization of Siam's economy as " self-sufficient" should be examined. " This has become one of the standard labels for early nineteenth-century Thailand. Johnston boldly assumed that throughout the first half of the nineteenth century, agriculture in central Thailand was largely the business of self-sufficient peasant households. This idea has also been adopted by some of the leading Thai economic historians. Chatthip Nartsu pha and Suthy Prasartset have elaborated on this assumed self-sufficiency. They wrote that up to the middle of the nineteenth century the process of division of labour could not develop, the householders produced almost everything necessary for their own consumption, that internal trade was very limited, and that the use of money was not still not widespread ( ibid., p. 235).

<sup>14</sup>Falkus, "The Economic History", p. 70. He further noted:

Certainly the extension of the settler frontiers in the rice-lands of the central plain was not a product simply of rising export demand; the frontier had been extending in the region throughout the eighteenth and the early nineteenth centuries. Also, large areas of the country, in the north and the northeast, produced a staple crop - glutinous rice - which was not exportable. Hence these regions could only gradually be drawn into an exchange economy. A Bangkok perspective, no less than a western perspective, carries the danger of distorting the picture of Thai rural society. The economic and social orientation of the north, moreover, was long more towards Burma than towards Bangkok; that of the northeast towards Korat or even Luang Prabang and Vientiane ( ibid., p. 70).

<sup>15</sup>cited in Evers, " Trade and State", p. 708.

substantial influx of Chinese came in the 1830s. According to Falkus: "It is arguable that it was not so much the Bowring Treaty, but rather an amalgam of economic, political and technological forces in the last quarter of the century (above all the ocean-going steamships, the Suez Canal, the flows of international capital and the tide of colonial expansion) which swept the Siamese economy along with them."<sup>16</sup>

The Bowring Treaty did not bring a sudden change to the expansion of rice mills (Table 3.3). Table 3.3 clearly indicates that until 1880 rice mills only gradually increased from 1 in 1858 to 12 in 1880. Afterwards, there was significant increase from 12 in 1880 to 37 in 1898. The figures in Table 3.3 give puzzling figures of the number of rice mills in 1897 and 1901. Why did the number of rice mills in Bangkok drop to 26 compared to 37 in 1898? It is seriously questionable why there was a broad fluctuation in the number of rice mills in that year.

**Table 3.3** Number of Rice Mills in Bangkok, 1858-1930

Year	Western	Thai-Chinese	Total
1858	1	-	1
1864	3	-	3
1866	4	-	4
1867	5	-	5
1879	5	5	10
1880	5	7	12
1889	6	17	23
1892	-	-	25
1895	4	23	27
1896	4	26	30
1897	4	22	26
1898	-	-	37
1901	4	22	26
1908	3	46	46
1910	3	56	59
1919	3	63	66
1924	-	83	83
1925	-	84	84
1929	-	71	71
1930	-	71	71

Source: Thaveesilp Subvattana, "Rice Production and Rice Trade in Central Thailand from the Reign of King Rama V to the Reign of King Rama VII", M.A. thesis, Chulalongkorn University, 1977, Table 5, pp. 223-224.

A growth of rice mills in 1830-1898 was caused mainly by the rising world market demand, the improved network of canal transportation in the central plain linking the port of Bangkok, (around 15 canal projects were undertaken). Finally, the improvement of modern ocean transportation and communications expanded Thai rice

<sup>16</sup> Falkus, "The Port of Bangkok", p. 5.



trade.<sup>17</sup> Bangkok's trade expanded. Table 3.4 shows the numbers of ships entering the port of Bangkok and the registered tonnage of the vessels between 1856 and 1929. We can see that a rapid expansion after the 1870s reflecting the growth of rice exports especially from the 1890s. All suggested that the Bowring Treaty had its limited impact upon the growth of Bangkok's trade.

**Table 3.4** Shipping Entering the Port of Bangkok, 1856-1929<sup>a</sup>

Year	No of vessels	net registered tonnage ('000 tons)
1856	141	n.a
1866	281	107
1875	463	213
1879	566	240
1888	469	358
1891-94	845	665
1900-04	1, 215	1, 097
1905-09	1, 553	1, 444
1910-14	1, 657	1, 501
1915-19	1, 813	1, 504
1920-24	1, 772	1, 822
1925-29	2, 119	2, 300

Sources: Malcolm Falkus, "The Port of Bangkok", n. d. p.11, based on British Consular Reports, various years, and *Statistical Yearbook of Siam*, various years ;and Suehiro Akira, *Capital Accumulation in Thailand, 1855-1985*, Tokyo: The Centre for East Asian Cultural Studies, 1989, p.53.

<sup>a</sup> Between 1891 and 1929 based on five-year averages.

Foreign trade not only brought business development to Bangkok, but also brought many foreign ideas which in turn led to the improvement of Bangkok. The Bangkok Calendar noted:

<sup>17</sup> Table 3.3 indicates the Chinese entrepreneurial role in rice mills became increasingly significant after 1879 and completely controlled the Thai rice mills after 1924. The major reasons that Thai-Chinese rice mills gradually replaced the Westerners were that rice marketing was controlled by Chinese merchants. Chinese merchants controlled trading companies. Chinese rice businesses could gain advantage from compradors or brokers who bought direct from the cultivator and/or connected to the external rice market through their networks of distributors at Hong Kong and Singapore. Finally they could control the large share of the Thai rice exports in Asia. About 3/4 of the total rice export went to the Asia market. Many rice mill merchants were Chinese who chiefly came from tax farming and whose investments were financed by the Privy Purses Bureau. In addition, some official noblemen also operated and owned rice mill business. Therefore, as trade expanded, Chinese and indigenous capital in rice mills became increasing dominant compared to western capital in Bangkok metropolitan area. Expanding rice mills in Bangkok signified the nexus between the Metropolitan and the peasant economy. The growing Chinese capital in rice trade was very much due to the growth of rice exports.

His Majesty the late king [Rama IV] was a prince of very uncommon learning and observation for a heathen, even at the beginning of his reign, and he came to the throne inspired with many European ideas of physical improvement, and set himself at once to improve his capital and kingdom. Hence he, at the beginning of his reign, opened this emporium to foreign trade on far more liberal principals than before existed, and hence the great western nations came in rapid succession and made treaties with Siam, and hence trade greatly increased, and consequently money and wealth came in rolling tides. <sup>18</sup>

Many techniques and items of western origin were introduced after the Bowring Treaty. For example, Rama IV employed Europeans and Americans, some as interpreters and translators, and some as instructors of the Army and police forces, which he began to model in the European fashion. Some were employed as navigators and engineers of the men-of-war and other steamers built during his reign. The use of printing presses, the mint, the substitution of the flat for the old bullet coins, the use of copper and tin cents instead of cowries, the custom house, and buildings of European architecture were among the many innovations in his reign.<sup>19</sup>

### **The physical growth of Bangkok**

The extent of Bangkok changed little during the slack period of the 1840s, but in the years 1851-54, when the Padungkrungkasern canal was dug, the area of Bangkok roughly doubled to 5,552 rai,<sup>20</sup> and the canal caused the city gradually to extend further eastwards in the 1860s.<sup>21</sup>

The physical growth of Bangkok was considerably influenced by canals at this time. The Bangkok Calendar noted in 1871:

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<sup>18</sup>Bangkok Calendar, 1871.

<sup>19</sup>Anonymous, *The Souvenir of Siamese Kingdom Exhibition at Lumpini Park, B.E.2468*, Bangkok: the Siam Free Press, 1927, p. 66.

<sup>20</sup>Department of Fine Arts, *The Record of Krungrattanakosin*, Bangkok: Department of Fine Arts, 1982, p.57.

<sup>21</sup> In 1851, the Padung Krungasem was dug from the edge of the eastern part of the Chaophraya River at the south of Wat Tewakoonchorn passing Mahanak canal and stretched to the Chaophraya River (at the eastern part at Wat Kaew Champha). This canal was 137 Sen and 10 wa in length. The total cost for hiring the Chinese labour was 27,500 Baht. The canal was completed in 1854 (Kitti, "Canals", p. 59).

The great canal Klawng Padoong gave at once great expansion and life to suburban interests. Not far from the same time, the still longer canal Hua-Lampong going eastward through thousands of acres of the richest-paddy fields to the head of the Big-bend, was cut... Such a convenience and privilege had never before been enjoyed by the residents of Bangkok. This canal shortened the distance from the Big-bend to Bangkok more than one half. The canal Mahaswas, leading from Bangkok-roi to Tacheen River, near the town of Nakawn-Chaisee [Nakornchaisri], a distance of about 20 miles, and thence to Pra-Pra-Tom, 7.5 miles, was completed soon after. The canal also going to Tacheen River a distance of 17 miles, was made in the latter part of the same reign, and shortens the distance to the part of the great Sugar district by full 24 hours of travel.<sup>22</sup>

We may deduce that canals contributed to growth of Bangkok in the 1850s and 1860s and there was a connection between the canals and foreign trade. Trade necessitated the digging of canals. In the case of Mahaswas canal (1861-1865), a link was made between Bangkok and the Tachin river. The canal enabled sugar to be sent from western regions, such as Nakornchaisri, to Bangkok. The construction of this canal therefore encouraged people to expand cultivation, clearing and planting cane on land further west. For example, in 1861 one year after the Mahaswas canal was completed, Rama IV gave large pieces of land on both sides of the canal to his children as private property (roughly 21,882 rai).<sup>23</sup> There were also two further canal projects directing the expansion of Bangkok to the west, namely Pasricharoen (1867) and Dumnoen Saduek (1867-68). These became major trading routes between towns along the Tachin River and Bangkok. After the 1870s, as rice exports grew rapidly, numerous canals in the central plain were dug to facilitate the movement of rice to Bangkok (Map 3.1).<sup>24</sup>

<sup>22</sup>**Bangkok Calendar 1871**, p. 151.

<sup>23</sup>Cited in Thaveesilp, "Rice Production", p. 5.

<sup>24</sup> More detailed information of canal construction are given as follows (Map 3.1). After the conclusion of the Bowring Treaty (1855), the liberalization of trade caused the increase in the European foreign power in the demanding for their economic interests concerned to the facilities of their trade and communication in Bangkok. The following canal construction expressed their powerful requests; Tanon Trong canal or Hua Lampong Canal (1856), the digging of a canal from the Bang Rak canal to the Hua Lampong canal (1861). From the middle 1850s onwards, canal construction changed its purpose from political and security reasons to economic purpose by securing communication and agricultural development. In the 1850s and 1860s canal constructions in some regions of the central hinterlands provided a transport shipment of sugar and sugar shipment which was a high weight product. Sugar and sugar products remained principal exports of Thailand until the 1860s. Between 1861 and 1868, three major canals were dug: Mahaswas (1861-1865), Pasri Charoen (1867) and Dumneon Saduek (1867-1868). These canals served the transport of sugar and sugar products from the producing areas, concentrated on the Meklong region covering: Nakhon Pathom, Nakorn Chaisri, Samut Songkhram, Samut Sakhon to Bangkok. Floods and water shortages in Nakornchaisri in the 1870s, and the decline in the market price caused by the production of cheaper sugar in Java, brought about the rapid decline in sugarcane cultivation in those regions. From the late 1860s, Thailand had experienced a considerable increase of external rice demand, and about 80-90 per cent of rice export originated from the central plain areas until around at least the 1910s. More than 15 canal projects were excavated from the early 1860s, the primary purposes of canal construction provided an improved irrigation condition and provided the trade and communication purposes (Table A).

Also in the 1860s, Bangkok gradually extended more to the east, when the first road, Charoenkrung or "New road", was completed in 1863, followed by two shorter roads, Bumrungruang(1863) and Fuzngnakorn (1863). Charoenkrung road stretched from the palace area, through the Sampeng district, and along the river through the commercial quarter. The road made communication and transportation more convenient between areas within the city wall and outside the city wall. Of all the districts in Bangkok, Bangrak and Sampeng were the fastest growing commercial areas (Map 3.2).

From the 1880s, commercial rice production expanded rapidly in the provinces adjacent to Bangkok, especially Ayuthaya and Chachoengsao. These provinces were

**Table A** Major Canal Construction in Bangkok and in the Lower Central Plain of Thailand from 1450 to 1910

Rank	Name	Length in km	Excavation		Purpose
			begin	completed	
1.	Samprong	26.0	-	1498	Communication and protection
2.	Bangkok Yai	-	1522	1522	Communication and protection
3.	Bank Kruai	4.0	1538	1538	Communication and protection
4.	Mahachai	25.0	1645	1721	Communication and protection
5.	Rawb-Krung	6.5	1783	n.a.	Communication and protection
6.	Mahanark	n.a.	1784	-	Celebration
7.	Bangkapi	?	?	?	?
8.	Pak lad Canal	17	Rama II	Rama II	Communication and protection
9.	Sunak Hawn	-	1834	-	Communication and protection
10.	Bangkhuntien	-	1831	-	Communication and protection
11.	Saen-Saeb and Bangkhanak	67.0	1837	1840	Communication and protection
12.	Padung krungkasem	5.48	1851	1854	Communication
13.	Tanon Trong	8.28	1857	-	Communication
14.	Si lom	2.72	1858	-	Trade and communication
15.	Chedi bucha	17.96	circa 1855	-	Trade and communication
16.	Mahaswas	27.36	1860	1860	Trade and communication
17.	Pasri Charoen	25.2	1867	1867	Trade and communication
18.	Damneon Sduak	33.6	1867	1868	Trade and communication
19.	Down Jan Canal	13.7	1868	1868	Trade and communication
20.	Prem Prachakorn	51.3	1869	1870	Agriculture and communication
21.	Nakorn Nuang khet	21.2	1876	1877	Agriculture and communication
22.	TaweeWattana	13.6	1878	1880	Agriculture and communication
23.	Naraphirom	21.7	1880	1880	Agriculture and communication
24.	Preng	17.9	1887	1888	Agriculture and communication
25.	Niyomyatra	7.2	1899	1899	Agriculture and communication
26.	Phai Singto	4	1904	1905	Agriculture and communication
27.	Luang Phaeng	15.8	1888	1890	Agriculture and communication
28.	Udom Chon Jon	15.4	1888	1889	Agriculture and communication
29.	Phra Phimon	16.6	1890	1890	Agriculture and communication
30.	Rangsit	668	1890	-	Agriculture and communication
31.	Charoen	30.6	1891	1892	Agriculture and communication
32.	Phraya Banlue	4.44	1892	1895	Agriculture and communication
33.	Bang Phli Yai	12.6	1898	1901	-

Sources: 1. N.A.R.5. M. of Agriculture (Department of Canals) no34/791 (1909).

2. Kitti Tunthai, "Canals and the Economic System of Thailand,1824-1910", M.A thesis, Chulalongkorn University , 1977, Appendix Table.

3. James A.Hafner, "Traditional Transportation System Development in Thailand: Inland Waterways" in *The History of Inland Waterway Development in Thailand*, The Department of Geography, University of Michigan, 1977,p. 1-15.

centres of fertile rice growing. Such development went hand in hand with Bangkok expansion. Bangkok gradually extended to the north when the Prem Prachakorn canal was dug in 1869-70. This canal provided a route between Bangkok and Ayutthaya extending 51.3 kilometres,<sup>25</sup> and encouraged people to settle in the northern part of Bangkok,<sup>26</sup> because it facilitated transportation and communication to Ayutthaya. Also Bangkok extended further to the east after the 21.5 kilometre Nakorn Nuang Khet canal (1876), and the 28.7 kilometre Praveit Burirom canal (1878) were dug because both canals shortened and provided more rapid communication and transportation between Bangkok and Chachoengsao which was the centre of a fertile rice growing district on the Bangprakong river.<sup>27</sup>

From the early 1890s onwards there was an even more a rapid rate of areal expansion when compared to the previous period as the city absorbed more of the surrounding countryside. Changes were caused by the construction of roads rather than canals. Roads brought various effects upon the expansion of trade and business, increasing the size of residential area and so on.

Between 1890 and 1910, large areas outside the city walls, formerly used for growing rice, Chinese cabbage, green onions, mangoes, betel nuts, were developed as commercial, residential and industrial areas, including Tung Wualumpong [currently Hualumpong], Tung Samsen [currently Samsen district], Tung Phayathai [currently Phaya Thai district], Tung Bangkokpi [currently Bangkokpi district], Suan Dusit [currently the area around Suan Dusit Palace], and Tung Sompoy [where ??]. The very names suggest the encroachment of the city on cultivated fields. [Tung in Thai means field and Suan means garden]. The changes took place as more roads were built. Before 1890, most residential areas were on the banks of the Chaophraya river and canals, but after a network of roads was completed from the 1890s, settlements moved away from the banks of the river and canals. This was the beginning of the residential and commercial quarter in the inner area. The consequence was that the cultivated land became more populated and thus the urban area expanded. Such transformation was helped by the introduction of western vehicles such as trams, train and personal cars from the late 1880s. The first tram in Bangkok was introduced in 1888. The first line began as a horse tramway, but was afterwards electrified and was then amalgamated with the electric light company, and power was supplied both for the tramway and

<sup>25</sup>N.A.R.5. M.of Agriculture (Department of Canals) no 34/791 (1909) .

<sup>26</sup>Chai Ruengsilp , The Thai History B.E.2352-2453: Social Aspects, Bangkok: Amarin Publishing Office,1976, p.282 ; and Department of Fine Arts, The Record of Krungrattanakosin, p. 91.

<sup>27</sup>N.A.R.5 M.of Agriculture (Department of Canals) no 34/791 (1909).

lighting from the one generating station. In the early 1900s, the length of line open was 17.3 kilometres, with another 16 kilometres planned.<sup>28</sup> Furthermore, in 1893, an electric train was built to connect Bangkok with Paknam, eliminating the need for a boat journey. By 1900, horse-drawn carriages were being replaced by cars which further reduced the role of transport played by canals.<sup>29</sup>

The traditional landscape of Bangkok, which consisted of city moats and a network of canals, underwent a marked change. The city landscape based on roads rapidly took shape. Bridges were built to span the canals. Built-up areas of new buildings such as row houses extended along the roads. Canal construction slowed, then ceased. Klong Sathorn, dug in 1895, was the only major new canal in Bangkok at the end of the 19th century. It extended from the Chaophraya river to Klong Hualumpong at its intersection with Wittayu road. After 1900, a few Thonburi canals were dredged for transport purpose but for the most part the age of canals in Bangkok was over. After 1915, no new ones were excavated.<sup>30</sup>

By 1910, the map of Bangkok had changed remarkably from its appearance of the 1880s. Many industrial, residential and commercial areas developed along the arterial roads: Sampeng, Dusit, Sarapatum, Bangrak, Bangkoalam, Banglumpoo lang, the part of district of Bangsue west of Klong Premprachakorn, and the district within the city wall.<sup>31</sup> In particular, Bangrak district was located south of Padungkrungkasem canal where New Road was linked to the central district area. Roads had significant effects on the growth of this district. Consulates, the residences of foreigners, the port, rice mills and saw mills were located in this area. Also, Sampeng district became the centre of trade and business in Bangkok and remained so until the 1950s. It was the headquarters of many of principal trading houses, banks, warehouses and leading hotels (Map 3.3).

Between 1910 and 1925, the most significant areal development was the extension of the built-up area to the west from Siphraya to Tanon Tok.<sup>32</sup> Across the city, urban boundaries were pushed outwards as adjacent rural areas which achieved the

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<sup>28</sup>Office of the Prime Minister, The Foreign Records of the Bangkok, p.167 based on Carter, The Kingdom of Siam.

<sup>29</sup>Steve Van Beek, The Chao Phya : River in Transition, Kuala Lumpur : Oxford University Press, 1995, p. 62.

<sup>30</sup>Ibid., p. 62.

<sup>31</sup>N.A. R.5 M. of the Capital 5.4/10 (1908)

<sup>32</sup>Department of Fine Arts, The Record of Krungrattanakosin, p. 91.

minimum official criterion for urban areas under the administration of Ministry of the Capital, were reclassified as urban (Chapter IV).

In the 1930s, the rate of areal expansion gradually extended to Thonburi province. King Rama I Bridge, opened in 1932, connected Bangkok and Thonburi and facilitated transportation between the two provinces. Also a number of roads were built in Thonburi. A large portion of orchard and forestry land in Thonburi was gradually transformed into commercial and residential areas.

Also in the 1930s, the growth of Bangkok was extended to the north by the construction of the road linking Bangkok and Nonthaburi which was formally opened in 1931.<sup>33</sup> In the late 1930s, the city's area expanded from the bank of the Padungkrungkasem canal to Patumwan, Phetchaburi and Ploenchit.<sup>34</sup> In addition, parts of other Bangkok districts such as, Tungmahamek, Yannawa, Bangkhen and Donmuang were also absorbed by the urban area.

#### **A land-based city**

From the 1890s onwards, Bangkok was transformed from a "floating" city to a "land-based" city. Before the 1860s, there were no roads in Bangkok. All traffic was undertaken by boats. Roads not only reflected European ideas on the physical improvement of the capital, but also stimulated trade and commerce. Roads represented an increasing demand from economic activity, especially caused by foreign trade. A British Consular report in 1900 noted:

Thirty-five years ago there were no streets in Bangkok. All traffic was carried on by boats, and the numerous canals still compete with the street traffic. As late as ten years ago there were no more than 9 miles of paved streets in the whole city. Today there are over 47 miles, and many new streets are being opened up each year, on which the old iron and wooden bridges are being replaced by modern steel bridges. The King himself builds one steel bridge each year out of his private funds as a gift to the city, and this is opened to the public with some ceremony on his birthday. The government imports from England every year considerable quantities of bridge materials.<sup>35</sup>

The first published census in 1910/11 (Table 3.5) indicated such a transformation. Some 182,253 residential buildings were constructed on land. A number of land vehicle were running on the roads, for example, cars, rickshaws, horse-drawn carriage, and trams. Bangkok's water transportation was gradually being

<sup>33</sup>Bangkok Chronicle, 6 November, 1931.

<sup>34</sup>Chulalongkorn University, *The Composition of Physical Growth*, p. 459.

<sup>35</sup>Account and Paper, 1900, Parliament Commons, Vol 87.

replaced by land vehicles. Growing road construction helped quicken the distribution of goods and services throughout the city, and people within the city became dependent upon roads for moving from one part of the city to another for such purposes as commerce, education, entertainment, and private business. As time passed, land vehicles became more common, while waterway transportation declined. For example, between 1910 and 1929 the number of cars increased from 401 to 3,361, and the number of rickshaws from 2,463 to 3,000, while vehicles for water transportation decreased significantly, for example, boats from 125,316 to 80,465 (Table 3.5).

**Table 3.5** Some Statistics of Monthon Krungthep from Population Census, 1910/11 and 1929/30

Items	1910/1911	1929/30
No. of Boats	125,316	80,465
No. of Cars	401	3,361
No. of Steamships	259	232
No. of Houses	182,253	n.a.
No. of Horse-Drawn Carriage	372	123
No. of Carts	268	193
No. of Rickshaws	2,463	3,000
No. of Bicycles	n.a.	5,248
No. of Trucks	n.a.	635
No. of Motorcycles	n.a.	308

Source: *Thesapiban*, vol. 13 (Special Issues) August 1913 pp. 257-259; and *Thesapiban*, vol 30, no2, 1929, pp.398-400.

Note: Figure above omitted the inner Amphurs in Bangkok.

The censuses give a good picture not only of the growth of various forms of urban land transport, but of the relative insignificance of such urban development elsewhere. Table 3.6, for example, indicates that as much 97 percent and 71 percent of all cars in the whole kingdom's were concentrated in Bangkok in 1910 and 1929 (Table 3.6).



**Table 3.6** Number of land vehicles in Mon hon Bangkok and the whole kingdom in 1910 and 1929

		(1) Bangkok	(2) Whole Kingdom	(1) as % of (2)
Horse cars	1910	372	1, 075	34
	1929	378	818	46
Rickshaws	1910	2, 469	3, 206	77
	1929	3, 000	3, 574	84
Cars	1910	401 <sup>1</sup>	413	97
	1929	3, 361	4, 734	71
Bicycles	1910	n.a.	n.a.	n.a.
	1929	5248	24, 232	22
Trucks	1910	n.a.	n.a.	n.a.
	1929	634	4, 824	13
Motorcycles	1910	n.a.	n.a.	n.a.
	1929	308	558	55

Source: *Thesapiban*, vol. 13, Special Issues, August, 1913, p. 259 ; and *Thesapiban* vol., 30. no 2, 1929 , pp. 390-391

<sup>1</sup> Cars covered private cars only, while public cars were excluded

## II

### The Historical Significance of Transport Development

Four broad periods can be distinguished; before 1890, 1890-1910, 1910-25 and 1925-the early 1930s.

#### Waterways prior to the advent of roads

Throughout the 19 th century water ways dominated transportation in Bangkok. As Crawford wrote in 1821:

The face of the river presented a busy scene, from the number of boats and canoes of every size and description which were passing to and fro. The number of these struck us as very great at the time, for we were not aware that there are few or no roads in Bangkok, and that the river and canals form the common highways, not only for goods, but for passengers of every description.<sup>36</sup>

Some thirty years later Pallegoix wrote:

There is not a single carriage in the capital: everyone travels by boat. The river and the canals are almost the busy roads, only rarely in the middle of the city and in bazaars or markets you find streets paved with large bricks<sup>37</sup>

<sup>36</sup> Crawford, *Journal of an Embassy*, p. 79

<sup>37</sup> Cited in Wolf Donner, *The Five Faces of Thailand: An Economic Geography*, Queensland: University of Queensland Press, 1978, p. 787.

It is impossible to exaggerate the continuing importance of canals for Bangkok's development in the late 19th century. They touched all aspects of commercial life, provided centres for residential areas, markets, recreation, drinking water and ceremonies. Generally, canals linked various regions of Bangkok itself and linked Bangkok with the provinces. The rice trade itself was almost totally river and canal-based, and remained so well into the post-1900 era of railways and roads.

Indeed rivers and canals enhanced the role of Bangkok as the leading port of the nation. As noted by Falkus:

Bangkok, city and port, grew in largely unregulated fashion in the nineteenth and early twentieth century, but everywhere the influence of trade and port activity put an indelible stamp on the character of the city. Maps of the period show just how important was the river to city development. Strung along the banks of the river, principally on the eastern but also on the Thonburi side, were the headquarters, warehouses, and private wharves of the western trading companies, the rice and saw mills and their wharves, the custom house, and the principal consular buildings... The old commercial port was centred on the wharves of the Bangkok Dock Company, a private company launched in 1865 with British capital. Early in the twentieth century the Company embarked on improvements and extensions; it then maintained two dry docks and three slipways and had extensive engineering works, as well as the principal wharves and storages facilities. Bangkok grew in elongated fashion along the river, with little extension away from the river until well into the twentieth century. Such extensions as there were tended to be along canals cut from the main river, and in this way grew such well-known present-day thoroughfares as Silom, Sathorn, and Rama IV roads.<sup>38</sup>

The principal canals were: Bangkok Yai (dug in 1522), Mahachai (1704), Rawb Krung (1783), Mahanark (1797), Saen Saeb (1840), Padungkrungkasem (1851), Hua Lumpong Canal or Tanon Trong (1856), Phasri Charoen (1864), Tawee Wattana canal (1878), Prayet Burirom (1880), Nakorn Nuang Khet (1876), Prem Prachakorn (1869) and Rangsit (1890s).<sup>39</sup> In addition, some minor canals were found within Bangkok: Klong Wat Sampleum, Klong Ronglata, Klong Wat Patum Kongka, Klong Sathorn, Klong Orachorn, Klong Suan Laung, Klong Sarapratum, Klong Ratchdamri and so on.<sup>40</sup>

In the late 1860s, the American Consul, Townsend Harris wrote of the dominance of the Chaophraya river as a most major route of transportation linking Bangkok and the provinces areas:

<sup>38</sup> Falkus, "The Port of Bangkok", pp. 14-15.

<sup>39</sup> N.A.M. of Agriculture, (Department of Canals), no 34/791 (1909).

<sup>40</sup> Songsan Nilkumhaeng and others, "Krunggrattanakosin", *Journal of Silapakorn*, Vol 25, no. 6, January 1982, p. 56.

Bangkok situated on the river Manu n, is the great center of the commerce, inland, coastwise, and foreign, of the kingdom. This river is the most important commercial channel in Siam; it provides the greater part of the kingdom, and monopolizes the heaviest share of its navigation and commerce. The principal articles brought down this river from the upper provinces are: rice and paddy, cotton, teak timber, sapanwood, lac, gum benzoin, ivory, and beeswax; while the district east and west of the Manum furnish gamboge, cardamums and sugar.<sup>41</sup>

The river and canals provided a means of low-cost transportation that increased the carrying capacity for rice and other crops. The bulk of transport from the central producing areas was bound for export through the chief port of Bangkok. About 70-80% of rice for export was shipped to Bangkok by boats until the outbreak of World War II. In marketing the rice product, the central plain depended primarily upon the vast inland waterway transport system to distribute to Bangkok for export or for the domestic consumption. Even after railways were built, in the 1930s more than 80 percent of rice exported from Bangkok was carried by water from the provinces to the rice mills.<sup>42</sup>

Canals required a large capital investment (Table below). For example, the digging of Mahaswas canal (1857-1860) required expenditure on the wages of Chinese labourers amounting to 88,120 Baht, equivalent to 4.4 percent of the national budget.<sup>43</sup>

Name	Capital Investment
The Chedibucha canal ( circa 1850s)	654, 363 Baht. <sup>44</sup>
The Padung krungkasem ( 1851-54)	27, 500 Baht <sup>45</sup>
The Mahaswas Canal (1857-1860)	88,120 Baht <sup>46</sup>
The Dumnoen Saduak (1867-68)	80, 000 Baht <sup>47</sup>
The Phasri Charoen (1867)	112, 000 Baht <sup>48</sup>
The Premprachakorn (1869-70)	203, 520 Baht <sup>49</sup>
The Nakom Nuang Khet (1876-77)	73, 940 Baht <sup>50</sup>
The Pravet Burirom (1878)	83, 740 Baht <sup>51</sup>
The Rangsit in 1892	400, 000 Baht <sup>52</sup>

<sup>41</sup>United States Consular Reports, Annual Report on Foreign Commerce, *Siam for 1872*, p. 991.

<sup>42</sup>N.A.R.7 M. of Commerce 8.1/1929.

<sup>43</sup> Shigeharu , "Historical Geography", p. 55.

<sup>44</sup>Kitti, " Canals ", p. 66.

<sup>45</sup> *Ibid.*, p. 59.

<sup>46</sup>Shigeharu, "Historical Geography", p. 56.

<sup>47</sup>*Ibid.*, p.62.

<sup>48</sup>N.A. R.5. M. of Agriculture (Department of Canals), no 34/791 (1909).

<sup>49</sup> N.A. R.5. M. of Agriculture (Department of Canals), no 34/791 (1909).

<sup>50</sup> Hubbard, "Canal Construction", p. 54.

<sup>51</sup>*Ibid.*, p. 55.

<sup>52</sup>Suntharee Asavai, **The History of Rangsit Canal: Land Development and the Social Impacts**, Bangkok: Thammasat University Press, 1987, p. 46.

The Bangkok Dynastic Chronicle indicated that the wages for Chinese labourers were considerable:

On Monday, the fourth day of the waxing moon of the seventh month (25 May 1868), the Minister of Military Affairs went to the opening of the newly excavated canal at Bang Nokkhwaek. Excavation of this canal was started at the end of the year of the Tiger, eight of the decade (1866/7), westward from the east bank of the Bang Yang river in Nakornchaisri Province to the Bang Nokkhawae: canal in Ratchburi Province. It is 840 sen (33.6 k.m.) long, 6 wa (12 metres) wide and 6 sok (3 m) deep. Wages for excavation and removing tree stumps amounted to 1,400 Chang (112,000 Baht), of which 1,000 Chang (80,000 Baht) was appropriated from the Minister of Military Affairs and 400 Chang (32,000 Baht) granted by the King.<sup>53</sup>

Of course, the huge capital investment of canal construction benefited capitalist production such as rice. The canals stimulated the rice trade, which in turn induced increased capital investments in rice mills in Bangkok and the hinterland. An employee of the Borneo Co., said in a talk in 1894:

Of late years, the Bangkok and Pauiew (Chachoengsao - approx 30 miles from Bangkok) rice mills have been a favourite investment of Siamese princes and nobles, who now own many of the mills, or hold mortgages on the n. The wealthy Siamese princes have always been fond of trade, and, after the treaties were made, they gave their support very freely to the Bangkok Chinese, who carried out a large trade with Siamese capital.<sup>54</sup>

The Dumnoensaduak (1867-68) and Phasricharoen (1867) canals were main routes connecting Bangkok with the Meklong and Tachin rivers and the western portion of the central river's. The Dumncensaduak canal was 33.6 kilometres and the Phasricharoen canal 25.2 kilometres long, 14 metres wide and 2.5 metres deep.<sup>55</sup> Important products of this region included rice, sugarcane and salt. Moreover, Samut Songkhram was also an important fishing town and dried fish was sent to the capital or sold to farmers along the canals. In addition, large quantities of products produced in Ratchaburi and Samut Sakhon were transported through the old Mahachai canal. This canal was 30 kilometres long joining the Tachin river at Samut Sakhon with Bangkok.

The Rangsit canal (1890s) was also known as the Tung Luang canal (Royal Meadow canal). It was a major east-west artery in the central canal system. The Rangsit project, in fact consisted of the main canal and 33 small canals totaling 890 kilometres in length.<sup>56</sup> The canal linked the Nakhon Nayok river with the Chaophraya and was important as a route for east-west commerce. The adjacent areas were one of the most important rice exporting regions. Van der Heide, in 1906 indicated:

<sup>53</sup>Cited in Shigeharu, "Historical Geography", p. 62.

<sup>54</sup> Cited in Chaiyan, The Rise and Fall, p.59.

<sup>55</sup>N.A.R.5 M. of Agriculture (Department of Canals) no 34/79 (1909).

<sup>56</sup>N.A.R.5 M of Agriculture (Department of Canals) no 34/79 (1909).

The rice growing regions, as far as export is concerned, are confined to the about triangular territory from Paknampo [Nakhon Sawan] down to the coast, which forms the plain of lower Siam.... Outside of this territory, practically no rice for export is cultivated.<sup>57</sup>

### Road construction, 1861-1889

Prior to 1861, no roads existed in Bangkok outside the royal palace compound. Some roads around the royal palace had been brick-paved, but roads were not in daily common use. The primary purposes of roads were for palace beautification, royal ceremonies, and to help the king to undertake personal meetings and public administration. Most road construction therefore was within the royal palaces, or in the areas adjacent to the palace.<sup>58</sup>

A first group of roads was within the grand palace named Amornwithi, Chakricharul and KhunKhunniwet Chitumporn. A second group of roads circled the outside wall of the palace: Sanamchai road, Naphralarn road and Taiwang road. A last group of roads radiated from the grand palace including roads in front of Chakrawatwangluang (currently Sanamchai road), Chakrawatwangna road (currently Na Phralarn road), Saochingcha road, Prachan road, the road in front of Wat Mahatard (currently Na Pratarad road), Na Rongmai road (currently part of Rajinee road), Ta Khun Nang road, Sampeng road (currently Trok Wanich 1), Lak Muang road, Ban Moa or Ban Yuan road, Saphan Seaw road, Pranakorn road, Taiwang, Tanow road (currently Fuang Nakorn), and Pratoosamyawd road (currently part of Charoenkrung road). Foreign visitors described the characteristics of roads in the 1830s:

Like Venice, the city seemed to have arisen from the waters... the streets are narrow and dirty, the paved walk in the middle being barely wide enough for two persons to walk abreast.<sup>59</sup>

A pedestrian excursion into the town being totally impracticable, on account of the depth of the mud in the street... It is very inconvenient to walk not only on account of the mud but from the number of dogs, these brutes appearing to consider Europeans fair game - during two or three excursions in this swampy town, I was attended by two of the boat's crew, armed with paddles, and we were therefore able to keep these troublesome animals at bay.<sup>60</sup>

<sup>57</sup> Cited in Chaiyan, *The Rise and Fall*, p. 51.

<sup>58</sup> Nij Hincheeranun, "Roads in Bangkok in the Evolution in 200 years", Conference paper read at the seminar of the growth and change in Bangkok in 200 years, Chulalongkorn University, 21-22 June 1982, pp. 6-12 ; Department of Fine Arts *The Record of Krung Rattanakosin* pp. 555-558 and Chulalongkorn University, *A Composition of Physical Growth*, pp.118-128.

<sup>59</sup> Hall, Ruschenberger and Fitzroy, *A Voyage Round the World including an Embassy to Muscat and Siam 1835, 1836, 1837*, cited in Nij, "Roads in Bangkok", p. 8.

<sup>60</sup> Earl George Windsor, *The Eastern Seas or Voyages and Adventures in the Indian Archipelago*, in 1832, 1833, 1834 cited in Nij "Roads in Bangkok", p. 8.

### A history of road construction. 1861-1889

Prior to 1890 there were few roads in Bangkok outside the royal compound. The first was Charoenkrung road built in the early 1860s, followed by only a handful of others in the succeeding quarter century.<sup>61</sup>

**Charoenkrung Road.** This, the first and for long the most significant commercial artery in Bangkok originated in the 1860s at the behest of the new resident western community. In 1861 the western consuls complained of ill health because there were no roads for making excursions in their horse-drawn coaches, and put pressure on the government to construct a road system in the capital.<sup>62</sup> Rama IV, who attempted to avoid conflict with foreigners, ordered Chaophraya Srisuriwong and Phraya Indrathipbordee to construct the "New Road". The earth for the road building was provided from the digging of the canal linking the Bangrak and Hualumpong canal. In 1863, the road was opened to traffic. Charoenkrung ran from the old moat (Klong-Ong-ang) at the edge of Chao Khmer palace to Klong Padungkrungkasem. A second segment was cut stretching from wat Traimitre to the river bank at Tumbon Dao Kanong.<sup>63</sup>

**Bumrung Muang and Fuang Nakorn (1863).** In 1863, Rama IV ordered construction of two roads linking with Charoenkrung road. First was Bumrung Muang. This road extended and improved an old road named Sao Chingha, which ran from Samamchai Road through Sao Chingcha to Prato-Samranraj [south of Pak-Klong-Talard]. This road was 2 kilometres in length. Second was FuangNakorn road running from south of Pak Klong Talard, passing Ban Mon Ban Yuan cutting Charoenkrung

<sup>61</sup>For the history of roads in Bangkok and economic impacts of road construction in the Fifth Reign (1868-1910), see, Sayomporn Tongasari, "The Impact of the Buildings of Roads in Bangkok During the Reign of King Rama V (1868-1910): A Study in the Area Within the City Walls, the Northern and the Southern Parts of the City", M.A. thesis, Siapakorn University, 1983.

<sup>62</sup>In the Fourth Reign, European merchants complained through western consuls about the obstacles of trading and proposed establishing a trading centre some eight or nine kilometres outside the city at a site near present day Prakanong. At their request, government dug the Hualampong canal to that site. The earth dug from the canal was piled along its north bank to make a road named Tanon Trong (1858), to Rama IV road in the subsequent period (possibly the 1920s). Some segment of this road was called Woa Lumpong road, later Hua Lumpong road (circa the 1920s). This canal was 6 wa wide and 6 sok in depth and 207 sen 2 wa 2 sok and then named "Klong Tanon Trong". The cost of canal construction was 16,633 Baht. After this canal excavation was completed, the merchant westerners refused to move on the grounds that it would be too far away from Bangkok (Thipakornwong, Bangkok Dynastic Chronicle Rama IV, pp. 184-185). More discussion contains in the writing of Nij, "Roads in Bangkok" pp. 18-19. Also see, Sayomporn, "The Impact " pp.18-25. In my opinion, Tanon Trong or Rama IV could not be characterised as a "road" in the western criterion. This road was a by-product of canal digging.

<sup>63</sup> Thipakornwong, Bangkok Dynastic Chronicle Rama IV, vol II, pp. 6-7 .

road and Bumrung Muang road to the north of Wat Borwonnivet. The total length was 4 kilometres.<sup>64</sup>

In 1869, one year after King Rama V came to the throne, there was some further progress. Bumrung Muang road was improved by straightening and extending its width, formerly 1.5 metres wide to 3 metres wide. Road improvements were also made around the grand palace, for example, Pralarn, Sanamchai, Taiwang, Mahachai, Rajinee, and Ausdang roads.<sup>65</sup>

We can see that road construction in Bangkok was both tardy and limited, and remained so until the early 1890s, we should ask therefore, why roads in Bangkok came very late.

We may note the location factor. The Chaophraya delta plain where Bangkok is located, was swampy and flat with low elevation. The entire city was approximately 1.5 metres above mean sea level. During the peak of the rainy season, many parts of the city were under water as the swollen river and canals caused temporary floods. The construction of roads under these circumstances was difficult and expensive owing to the low level of land. The frequent flood made maintenance costs very high, especially because construction techniques were primitive. Road construction was undertaken by gang of coolies using the simplest hand tools. Moreover, most people lived along the banks of the canals or the river since all parts of Bangkok at that time were connected by either large or small canals. If there were no waterways in any area people would dig a canal or a ditch to make that place accessible by water. It was rather easy to construct additional canals attached to the main waterways, as is clearly evidenced by the multiple branching of small canals we can see in contemporary maps.<sup>66</sup>

The slow development of road construction was caused also by the low demand for roads stemming from economic activities. Until the 1880s, outside the royal compound, there were not more than 5 roads in Bangkok, and this reflects our earlier point that the Bowring Treaty did not bring a sudden transformation in Bangkok. Statistics of rice mills as previously discussed showed very slow growth before the 1880s, while other branches of industrial development were almost non-existent. Even the rice mills and saw mills which existed created little demand for roads, because

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<sup>64</sup>Chulalongkorn University, *The Composition of Physical Growth*, p. 271.

<sup>65</sup>Sayomporn, "The Impact", pp. 39-48.

<sup>66</sup> Sternstein, *Portrait*, p. 28.

waterways were the predominant modes of transportation from the provinces. Rice and paddy, teak and timber came to Bangkok by the Chaophraya river and its network of canals. Several trading agencies established themselves on river sites, and a western commercial area evolved on the two banks near present-day Silom and Bangrak.

### **The contribution of road construction before 1890 to Bangkok's growth**

Roads were of much less importance than waterways. Such roads as existed before 1890 were usually undertaken in parallel with canal excavation, because the existing canals provided the concentration of settlements, the major routes of transportation and the materials for construction. The early major road constructions (Charoenkrung, Silom, Fuang Nakorn, Bumrung Muang and Tanon Trong) were all undertaken in parallel with canal excavation. In the case of Rama IV and Silom roads, the earth used for construction was dug out from adjacent canals. Some parts of Charoenkrung, Fuangnakorn, and Bumrung Muang complemented existing canals. A later section of Charoenkrung road was built by the earth from digging of a canal from the Bangrak canal to the Hualumpong canal.<sup>67</sup>

Roads played only a minor role in contributing to Bangkok's growth prior to 1890. Roads acted as feeders to complement waterways to facilitate the movement of products. However, the economic significance of Charoenkrung gradually increased and led to changes in the development of Bangrak district. Once a number of bridges were built, a city landscape based on a road system gradually emerged with the development of clusters of communities, consulates, residences of foreigners, the harbour, docks, rice mills, saw mills, warehouses and churches located in this district.

Road construction between 1861 and 1890 certainly brought no sudden transformation from water to land. A substantial portion of Bangkok's population remained living along the banks of the river and canals until well after the 1880s. However, the building of roads gradually induced row house construction, mostly following the Singapore model with buildings along both sides of roads.

A further noticeable impact of roads was the impulse they gave to the construction of palaces and other royal buildings. The expansion of palaces produced fine buildings within and outside the city walls. During the Fourth Reign (1851-1868)

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<sup>67</sup>Thipakornwong, *The Bangkok Dynastic Chronicles Rama IV*, Vol I, pp. 78-179.



three royal palaces were built for the king, and Patumwan Palace, Nuntaautayarn Palace, Saranrom Palace and a further nine palaces for princes and princesses.<sup>68</sup> Subsequently, as the many scores of the king's children reached adulthood, the numbers of royal buildings multiplied, some giving rise to new commercial and residential areas.

The multiplication of palaces accelerated the change from water to land. The Bangkok Calendar in 1871 observed:

Not only the royal palace of the 1st King was greatly improved in the late reign, but also many parts of the city and suburbs of Bangkok. Several new streets were made within the citadel, and a continuous block of buildings nearly half mile in length, was erected on each side of one of them. In the Third Reign, there were very few substantial buildings in the citadel excepting those comprised in the two royal palaces and the temples. By far the greater part of the princes and princesses who were not included within the walls of those palaces, lived in but poor houses made of wood, and not a few were even shabbily enclosed with bamboo wattling. But now you may see good dwelling both of wood and brick in very many localities besides the many which the late king [the Fourth Reign], at his own expense, caused to be erected for the improving of the city. And we feel happy in being able to say, that His Majesty, the present supreme king, is giving many tangible proofs that he is determined to continue the spirit of improving the city, which his illustrious sire and predecessor inaugurated, and that in our opinion he will speedily make great and cheering changes in the appearance of it.<sup>69</sup>

However, from the early 1880s onwards, settlements gradually moved from the banks of waterways to along the major roads, at that time mainly Charoenkrung and Bumrung Muang. A postal directory of 1883 indicated that there was already a considerable population living along Charoenkrung, Bumrung Muang, and Fuang Nakorn roads. Table 3.7 shows that the Chinese constituted the largest proportion of ethnic groups and were well distributed throughout the city. Table 3.7 also shows the significance of Charoenkrung as a mainstay of Bangkok's population when compared to other roads.

**Table 3.7 Ethnic Distribution along Various Roads in Bangkok in 1883**

Roads	Thai	Chinese	Indian	Westerner	Other	Total
Charoenkrung	322	866	85	38	16	1,327
Bumrung Muang	114	210	23	1	6	354
Ban Khamin	152	49	4	-	-	205
Fuang Nakorn	163	145	7	5	-	320
Rop Phranakorn	578	174	2	5	3	762
Sampeng	12	483	24	1	-	520
<b>Total</b>	<b>1,341</b>	<b>1,927</b>	<b>145</b>	<b>50</b>	<b>25</b>	<b>3,488</b>

Source: Adapted from Constance M. Wilson, 'Bangkok in 1883: An Economic and Social Profile', JSS, Volume 77, Part 2, 1989, Table 4, p. 54.

<sup>68</sup>M.R.Nangnoi Saksri, *Royal Palaces and Palaces in Bangkok, 1782-1982*, Bangkok: Chulalongkorn University Press, 1982, p. 523.

<sup>69</sup>Bangkok Calendar, 1871, annually.

Askew noted that many changes followed in the few years subsequent to the directory:

This picture derived from the 1883 Bangkok Postal Directory catches the area on the verge of transformation. Around the turn of the century, following settlement patterns initiated by Rama V in establishing his sons in palaces to the north of the city wall, a number of Phraya and Mom Luang built their palaces along today's Phra Athit Road. This road followed the path of the old wall, curving at the Pra Si mein Fort to run parallel to the Banglamphu canal. More or less parallel to Pra Athit road, Chakrapong road pushed northwards as a continuation of the new Rajdamneon Nai, part of Rama V's great project of building a royal thoroughfare from the old palace to Dusit. As part of the same project, the wide avenue of Rajdamnoen cut through the northern section of the Sao Chingcha district, thus creating a distinct wedge of land to the north, enclosed at its perimeter by the Banglamphu canal.<sup>70</sup>

### **Road construction, 1890-1910**

Before the 1890s, Bangkok remained tied largely to its waterways, with only a few urban streets challenging the dominance of water, and even these streets usually developed adjacent to waterways. But from the 1890s, there was nothing less than a transformation. A remarkable development of urban street construction took Bangkok far from its virtual sole water-base by the death of King Chulalongkorn in 1910.

We shall first examine the reasons underlying the changes before detailing the changes themselves.

First, we have growing economic activities in Bangkok, where from the 1880s onwards, several important developments took place. Above all, the international rice trade developed on a large scale. This was a crucial factor to attract a substantial influx of Chinese coolies. Trade brought a range of economic activity to Bangkok, such as rice mills, shipping, warehousing, banks, manufacturing production, and distribution of imports and exports. Centre of trades and commerce such as Bangrak and Sampeng felt the growing demand for transport. As a result, roads were built within Bangkok principally as feeders for the river and canals. Furthermore, roads were subsequently built as feeders to the railways. The first major provincial railway between Bangkok and Korat was opened in 1900, and sparked a growing demand for transport linking the city and the provinces. At about the same time, demand for roads was created by a number of motor vehicles in Bangkok which increased during the 1890s and the 1900s.

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<sup>70</sup>Marc Askew, *Interpreting Bangkok: The Urban Question in Thai Studies*, Bangkok: Chulalongkorn University Press, 1994, p.163.

The growth of trade and business in Bangkok resulted in the high price of land which in turn encouraged the king and certain others of the elite to build roads as business investments. For example, the first private road building was undertaken by Luang Sathornrajyukti around 1890, a road named "Sathorn". He developed his land at southeast of Silom and constructed another road and canal running parallel to it. He divided the land into small plots and sold them. The construction of Sathorn road helped turn the entire areas into a residential centre noted for the many fine homes belonging to the resident foreign community.<sup>71</sup> Afterwards, the building of roads not only enhanced the capital investments of the elite but also helped the city area extend into the suburbs. A recent history notes:

The process continued rapidly when two more roads parallel to Silom were built in the northeast. Around 1893, Chao Phraya Surawongsewattanasak ordered the construction of Surawongse, a road parallel to Silom, and Decho, a cross road joining the two. Si Phraya Road, another road parallel to Silom and Surawong further in the northeast, was built shortly thereafter. This group of four roads then became a focal area for home owners who wanted to live away from the crowded inner city. The area became known as "The Four S's" as each of the four roads had its name beginning with an S.<sup>72</sup>

Si Phraya road was built in 1905, when four noblemen of the rank of Phraya [hence Si (four) Phraya] successfully petitioned the king to construct a road for the development of their business:<sup>73</sup>

**13 August R.S.123, To His Majesty:** In regard to the land at the corner of Charoenkrung road at Hongkong Bank, we bought some plots of land from a number of people. However, there are no comfortable roads cutting across this Tambon. In my opinion, if the construction of road is undertaken, it will facilitate the transportation and communication. Conferring with the residents in this Tambon, they are pleased to join co-operation by granting money to build a road. So I would like to ask you to give a permission to construct a road running from Charoenkrung road to the corner Wat Hua Lumpong with a total length of 35 sen 8 wa and its width of 5 wa. The road will be surfaced by the brick pavings.

Phraya Indhrathipbordi-  
sriharajrongmuang  
Phraya Piphatkosa  
Phraya Noranijrajahuj  
Phraya Noranartpakdi

Many commercial activities in Bangkok such as tramways, hotels, and dock facilities, all created demand for roads. The impact could be direct, as in 1910 when the Siam Commercial Bank petitioned the king:

<sup>71</sup> Anonymous, *Yesterday and Today of Silom Road*, Bangkok: Amarin Printing Group 1992, p. 18.

<sup>72</sup> *Ibid.*, p. 18.

<sup>73</sup> Office of the Prime Minister, *A Collection of Manuscript of the Fifth Reign*, Part III no 1, Bangkok, 1970, pp. 148-149.

The Siam Commercial Bank, Ltd., has purchased a piece of land on the Banks of the Manam Chow Phya [Chao Phraya] and adjoining the Harbour Department, they have caused a handsome and decorative building to be erected thereon for the purpose of carrying on their increased banking business of which they now hold one of the biggest shares of all the Banks. The building will be finished in a few months time and Your Majesty's petitioners are anxious to have the surroundings of the new building beautified so as to bring them in accordance with the structure. One of the most effective improvements towards the achievement of this intent is the building of a new road leading to the river between the premises of the Harbour Department and those of the Bank. For this purpose it would be necessary to have a very old house belonging to the Harbour Department pulled down and the said department would have to give up a portion of their ground - which is not used for other purposes. On the other hand Your Majesty's petitioners are prepared to make over to your Majesty's government the portion of their ground which is wanted for the new road - if the road and a landing in the river shall be built. Your Majesty's petitioners humbly draw attention to the vast improvement which by this action would be effected not only to the Bank but also to the Harbour Department and the public in general as a public road leading to the river in this part of the town would be of very great benefit. Your Majesty's Petitioners beg leave to state that the Ministry of Local Government H.H. Chow Phya [Chao Phraya] Yomaraj and the Director of the Harbour Department Phya [Phraya] Visutr-who have frequently inspected the place - have recognized the utility of this new road and they are in favour of it being constructed. Your Majesty's Petitioners have ventured to present this petition knowing that Your Most Gracious Majesty will support the improvement of the town of Bangkok and in the hope that Your Most Gracious Majesty may be pleased to order the construction of the new road.<sup>74</sup>

Third, there were developments from the 1880s brought by western technology which went hand in hand with city roads and streets, for example, tramways running, electricity, the telegraph, the telephone. For example, in the 1880s Danes introduced a horse-tramway, electrified and extended in 1893. The initiative of British and Danish merchants formed the first narrow gauge railway company running a line from Bangkok to Paknam in the early 1890s. In 1898 Danish capital also took over an ailing American electricity supply company which later amalgamated with the tramway company and which continued in operation until taken over by the Thai government in 1950.<sup>75</sup>

The trams also contributed a substantial revenue to the Ministry of the Capital. As noted by one letter from Siam Electricity Company in 9th April 1, 1913, concerning the petition to Rama VI that track-rent should be reduced:

<sup>74</sup>N.A. R.6. M. of the Capital 21/7 (1910).

<sup>75</sup>Falkus, "Early British Business", pp. 120-121.

The Concession under which we are working, graciously granted in April 1904 by his late Majesty King Chulalongkorn, stipulates that a track-rent shall be paid to the Siamese Government at the rate of Ticals 5,000 per mile for the parts of our lines which were South of Lok Road (14,271 metres length) and Ticals 1,2000 per mile for the lines running from Lok road and along the Dusit Park district to the mouth of Klong Samsen (4,460 metres length). Originally this worked out at a figure of Ticals 47,941.80 per annum but after the suppression of our lines along the Duang Dao and Duang Duen Roads a reduction of Ticals 1,035 was granted and the total rent now amounts to Ticals 46,906.80 per annum... (The investors in the Siamese Tramway Co. Ltd have had very scanty return on their money. Taking an average it amounts to 1.2 % for 7 years, (between 1905 and 1912). This is in spite of the fact that every effort has been made to reduce expenditure, which now stands at a figure which cannot be reduced if we are to afford efficient service to the public. The amputation of our line along the Duang Dao and Duang Duen Roads was a severe blow to our company. It is true that a reduction was made in track-rent corresponding to the portions removed, but parts of our lines have been isolated, namely the Duang Duen Nork and Dao Kahng Roads. Of these lines the one along Kor Sua road leading to Wat Deveraj Kunjorn does not yield any income at all as it does not pay to keep traffic on same and from the line along Duang Duen Nork Road leading to the mouth of Klong Samsen we can only derive a limited income by a friendly co-operation with the Samsen line of the Siam Electricity Co. Ltd. It is also worth to note that although the track-rent on the part removed is low (Ticals 1,200 per mile compared to Ticals 5,000 per mile on other parts of the line) said part was most valuable and reduction in track rent does not correspond to our loss... (The gross revenue of our tramways has fallen of in a very disappointing way. From Ticals 445,100 in 1906/7 it has fallen to ticals 306,333 in 1912... (Having regard to the above-mentioned facts and considering that our Company has to pay a yearly track-rent of Ticals 46,906.8 regardless of what income we derive from our working (whereas other public conveyances pay no track-rent) and considering further that the track-rent is only paid for the privilege of running our cars (for each of which we pay a yearly registration fee of Ticals 48), the upkeep of the road our line occupies being paid for ourselves, we beg to submit that this track-rent is too high. We now humbly beg to petition your majesty that the above-mentioned track-rent be reduced.<sup>76</sup>

The Government Power Station and the Siam Electricity Company together supplied the town of Bangkok and its environs with electric light. There was also a thoroughly up to date and well-equipped water-supply station, which was under the charge of a government department. There were two British dockyards, which had slipways able to deal with the various types of vessel that were able to come up the Chaophraya river, in addition to the Royal Naval Dockyard. Both these companies, in addition to several others, also undertook building contract work, and erected ferro concrete buildings in various parts of Bangkok.<sup>77</sup> With respect to electric power, electric power was practically confined to Bangkok, where there were two stations already in the 1880s. The larger and older station was under Belgian-Danish management with a normal running capacity of 12,000 KW and a reserve capacity of 15,000 KW, part of which was periodically employed. Apart from lighting most of the town, this plant owned and operated the city tramways and provided power for two suburban tram services for operating the road bridge across the river, for the oil refinery, for the tobacco factory and soap works, and for part of the needs for the

<sup>76</sup>N.A. M. of the Capital 13/3 (1913-1915).

<sup>77</sup>Anonymous, *Siam Resources*, n.d. p. 40.

power of several of the rice mills and industrial establishments. The other station, Samsen station, was Government owned. It had a capacity of about 10,000 KW and supplied light and power to the northern part of the city. About half the output served to drive the cement factory and also provided power to the airfield establishment at Don Muang and the military arsenal.<sup>78</sup>

Fourth, we must note the growing prosperity of Siam, and of king and state in the period. Fiscal reforms in 1892 led to the centralization of taxation. Greater revenue meant more expenditures on roads and other investment projects, such as railways. Greater revenue also came from the rapid economic development between 1880 and 1910. The terms of trade significantly improved.<sup>79</sup> Under the circumstances, the government was able to collect greater revenues ( Table 3.8 ).

**Table 3.8** Government Revenue, 1889-1910 ( in Million Baht)

Year	Total	Year	Total
1889	12.0	1903/04	42.5
1894/95	17.3	1905/06	50.5
1895/96	18.1	1906/07	55.5
1896/97	20.6	1907/08	54.3
1897/98	24.9	1908/09	58.9
1898/99	28.2	1909/10	60.7
1899/00	29.6	1910/11	61.4
1900/01	35.1		
1901/02	35.6		
1902/03	38.4		

Source : Constance M. Wilson, *Thailand: A Handbook of Historical Statistics*, Boston: G.K. Hall & Co, 1983, pp. 242-242.

Fifth, the Ministry of the Capital (Krasuang Nakornbarn) was established in 1892. With an increasing population and expanded economic activity, it was necessary to organize municipal government to administer Bangkok affairs (a historical background of Ministry of the Capital is given later in Chapter IV). The Ministry of the Capital assumed complete responsibility for all arrangements affecting municipal or sanitary matters, such as construction and repair of public streets, cleaning of streets, construction and cleaning of canals, supply of water for consumption, the removal of garbage and its destruction at an appropriate place, proper drainage. Roads were put in

<sup>78</sup>Anonymous, *ibid.*, p.40

<sup>79</sup> For aspects of economic development of Thailand, see Sompop Manarungsan, *Economic Development of Thailand, 1850-1950: Response to the Challenge of the World Economy*, Institute of Asian Studies, Chulalongkorn University, 1989.

the hands of the Department for Sanitary Affairs within the Ministry. The Ministry's jurisdiction was (a) the Amphurs within the city wall, (b) the Amphur Sampeng, (c) the Amphur Sapratum, (e) the Amphur Bangrak, (f) the Amphur Bangkoalam, (g) the Amphur Banglumpoo lang and (h) the part of the Amphur District of Bangsue west of Premprachakorn canal.

By the 1900s, expenditure on road construction and repair was significant. In 1906, for example, around 40 percent of the Sanitary Department's expenditures went on roads (though little on new roads in that year). Westengard, the General advisor complained that :

At present the Sanitary Department is in charge of roads, drains, klongs, hospitals, and street lighting. Its appropriations amount to roughly, one and half millions ticals a year. Of this sum there was spent in 1906 nearly 657,000 on roads; only about Tcs.40,000 of this went for the construction for new roads; that is to say, about Tcs 635, 000 were expended on the repair of roads. <sup>80</sup>

### **A history of road construction, 1890-1910**

Until 1890, as we have seen, there were only a few roads in Bangkok. But from 1890, the situation changed. In that year Prince Narisaranuwatiwong, the Minister of Public Works, proposed a plan for road cutting in Bangkok. The plan was called the Amphur Sampeng project and proposed to cut no less than 18 roads in the commercial district of Sampeng. It is not surprising that attention should turn to this area. Sampeng had been a hub of commerce in Bangkok almost from its establishment in 1782. The demand for roads was determined by the concentration of economic activity in that area, including retail and wholesale businesses and the head offices of distributors. The advantage of location of Sampeng area was the proximity to the river ports which were centres of domestic water transportation. For example, Rajawong river port was the major port connecting Bangkok to Chon Buri, Bandon (currently Surat Thani province) and some major seashore provinces in Thailand.<sup>81</sup> Bangkok's domestic riverine transportation stimulated the expansion of trade and commerce. Sampeng, a centre of commerce of Bangkok, had very inadequate roads which in turn caused obstacles to trade and business. We can imagine how the growth of the rice trade and the influence of Chinese in the 1880s put the pressure on the district.

Prince Narisaranuwatiwong wrote in 1890:

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<sup>80</sup>N.A. R.S. M. of the Capital 5.4 /10 (1907).

<sup>81</sup> Department of Fine Arts, *The Record of Chulalongkorn*, pp. 563-567.

In my opinion, there are no places which are more prosperous than Sampeng District, since its physical advantage is suitable for trading location, while its deficiencies of location are that the district has very few roads which in turn obstructed trading and prosperity. If roads in the district are constructed, the land will be developed and price of land will be increased many fold.<sup>82</sup>

But there was another significant reason for attention to Sampeng. The Privy Purse Bureau (PPB) was anxious to find profitable investment opportunities. Commercial activity in the 1880s resulted in a high price for well-situated land which attracted the PPB to invest. The PPB was a major source of capital. It was the largest of land owner in Bangkok. Some major commercial activities of the PPB included rent collections from market places and row houses. An excellent study on the investments of the Privy Purse Bureau in the period 1890-1932 by Chollada Wattanasiri (1986) indicates how extensive such investments were becoming:

It is found that the Privy Purse in many of its businesses came to take the roles...of a big investor... The most significant of these activities were lending, renting land market sites (allocation) and shop-house construction for subsequent renting and share purchasing. The investments of the Privy Purse were most intensive in the fifth reign... Aimed primarily at reaping financial profits from the undertaking, the Privy Purse's investments were especially concentrated in those businesses which yielded fixed and secure returns, such as interests from loans, rents from letting and other immovable properties, as well as dividends from shares in businesses. All these are financial investments which do not cause direct real output increases, but help to promote real investments of several merchant groups in the country, such as, lending to Chinese and Western merchants, and financing the bureaucrat-capitalist group by purchasing large amounts of shares in their newly-started companies.<sup>83</sup>

In this way the expanding in investments of elite capital was certainly a factor in the physical as well as commercial growth of Bangkok, for investment generated a need for physical infrastructure. Road construction went hand in hand with row house investment by the PPB to accommodate the swelling population, most of which were Chinese immigrants.

We referred earlier to the Sampeng Road project, and as a result of this the following roads were built in Sampeng district by 1898 (Table 3.9).<sup>84</sup>

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<sup>82</sup>cited in Sayomporn, "The Impact ", pp. 54-55 based on N.A. R.5 M. of Public Works, 9/1 no 370/1 (1892).

<sup>83</sup>Chollada Wattanasiri, "The Privy Purse and the Business Investment, 1890-1932," M.A. thesis, Silapakorn University, 1986, p. abstract cited in Chaiyan, *The Rise and Fall*, p.71.

<sup>84</sup>The information in table above mostly obtained from Nij "Roads in Bangkok" pp. 27-28.



Table 3.9 A List of Some Major Road Constructions Around Sampeng District ,1892-1898

Year	Road Construction and its Description	Sources
1892	Yaowaraj Road was constructed between the middle of Charoenkrung and Sampeng Road. It started from Mahachai Fort running southwest to Charoenkrung Road at Wat Samchin (the area at Wat Samchin Bridge). This road was 35 sen in length and 20 metres wide the car lane was 14 metres wide each footpath was 7 sok wide.	Government Gazette No 8, p 410 R.S. 110
1892	Rajawong Road stretched from the east of Chaophraya river bank passing Sampeng Road and Yaowaraj Road to Charoenkrung. Its length was 670 metres.	N.A.R.5 M. of Public Works 9/1 no.1 (1893)
1892	Sanamkwai Road (or Nang Lerng Road currently renamed as Nakornswan Road) ran from Preatimas door, which was located opposite the Mahakarn Fort to Phitsanulok Road. The total length was 1, 310 sen.	N.A.R.5 M. of Public Works 4/25no.46 (1893)
1892	The road (no name) ran from Charoenkrung road to Klong Toey Road ran, and from Charoenkrung at Pak Trok Rongphasi exiting at Wua Lumpong field [Hua Lampong] along Silom Road.	<u>ibid.</u>
1893	Chakkrawat Road began at Charoenkrung Road (at Phraya Mahamontri house) running southward beside Wat Chakkrawat to the Chaophraya river This road was 20 sen 2 wa in length and 10 wa (20 metres).	Government Gazette no 9 R.S. 111 p 66
1893	Kaosarn Road (now Chanasongkram Road) ran from Wat Chanasongkram to connect with Fuang Nakorn Road. The total length was 10 sen 6 wa 1 sok and 7 wa 2 sok wide.	<u>ibid.</u> , p.46
1893	Burapa Road linked Pahurat Road to the back of Burapapirom palace joining Chalermkrung Road. This road was 6 sen 3 wa in length and 7 wa 2 sok wide	N.A.R.5. M.C.464/28, no 1 (1894)
1893	This road which was located at the north of Lawd canal ran from Seaw Bridge to city wall at Pal. Trok Rongmai	N.A.R.5.M.C 464/28, no1 (1894)
1895	Luang Road linked Charoenkrung and Bumrung Muang to the road in front of Wat Thepsirintarawat Unakarn Road ran from Kaosarn road through Preatamas gate.	N.A.R.5. P.W.no.9/4 (1895) <u>ibid.</u>
1896	Road was located at the edge of the south of Lawd canal Road ran from Chaochan fort to Ta pae Road	N.A.R.5.P.W.no 4/23 Box 2 (1896) N.A.R.5P.W. no 46 4/39 Box 2 (1897)
1897	Worachak Road ran from Chaochan palace to Prince Prida Palace	<u>ibid.</u>
1898	Surawong Road branched from Charoenkrung to Hualumpong railway station at Sirapratumwan Road.	N.A.R.5 P.W.9/28 (1899)

While commercial activity brought roads to the commercial districts, royal embellishments were causing road building elsewhere. In 1899, one year after visiting Europe, Rama V constructed the Suan Dusit palace in the northern part of Bangkok between Padung Krungkasem canal and Samsen canal.<sup>85</sup> He personally proposed a project for road construction around Suan Dusit Palace providing transportation and communication between the palace and surrounding areas.

As a result, roads were cut as follows: Rajawat [Nakornchaisri Road], Seaw [Sawankalok], Koa Sua [Phitsanulok Road],<sup>86</sup> Prachairchin [Phetchaburi],<sup>87</sup> Buay, Tubtim Road, Hongyom Road, Tek Neau Road, Tek Tai Road, Pak Po Road Munkornyom Road, Pueypoa Nguan Road and Putthan.<sup>88</sup> Also, Sanghi Nok [Rajawithee road] and Duangduean Nok [Sukhothai Road], were cut from Samsen road to the Chaophraya river. These roads encouraged considerable settlements around the Samsen road area because it was easily accessible to trade around the bank of the Chaophraya river.

Also in 1899, the Tanon Rajadamnoen area project was approved and started. The primary purpose was to facilitate the king travelling between the grand palace and Dusit palace, but it also served as a signal of the city's prosperity and also as a place for recreation and relaxation.<sup>89</sup> Along Rajadamnoen areas were constructed government offices<sup>90</sup> and in a short time an area that had been a rather lonely forest area became a bustling and developing area.<sup>91</sup>

Begun in August 1899, Rajadamnoen road was completed on August 7, 1901. Its length was 760 metres stretching from Preastimas road [Nakornswan road] to connect Benjamas road.<sup>92</sup>

In 1901, another project off Rajadamnoen was built, called Rajadamnoenklang Road. This road was 1,200 metres long and 58 metres in wide, running from

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<sup>85</sup> Chai, *the Thai History Social Aspects*: B.E.2352-2453, p. 297.

<sup>86</sup> N.A.R.5. M. of Public Works 9/39 no 36/44 (1900).

<sup>87</sup> N.A.R.5.M.of Public Works 9/90 no 36/414 (1900).

<sup>88</sup> N.A.R.5.M.of the Capital 1/50(1900).

<sup>89</sup> *Collected Law*, no 17, pp. 105-106 (1901).

<sup>90</sup> N.A.R.5 M. of Public Works 9/41 (1899).

<sup>91</sup> *Royal Government Gazette*, Vol 16, (1899), p. 276.

<sup>92</sup> N.A.R.5.M. of the Capital 2/86 Box 7.

Saphanleaw, passing Banglumpoo canal, Rajadamnoen Nok,<sup>93</sup> Parnhipoblila bridge, and Ban Tanow Ban Dinsaw to arrive at Parnfaleelard Bridge.<sup>94</sup>

Completed in 1903, the last road construction in the Rajadamnoen project was Rajadamnoen Nai. This road stretched from an angle of Napralarn road and Sanamchai Road to Prachan Road (area around the eastern part of Sanum Luang) connecting Rajadamnoen Klang at Parnhipobleela bridge.<sup>95</sup> A symbol of Siamese independence and prosperity, the road vied with the great thoroughfares of Europe.

The Rajadamneon project was built by the king. At the same time, increasing road construction was initiated privately by various wealthy merchants and nobles, indicating the growing participation of land speculators and construction interests in the extension of economic activity to more suburbs. A list of private roads is given in Table 3.10.

**Table 3.10** Private roads in existence in 1905

Name	Description	Sources
1. Sathorn Tai	Starting from Chaler m kiat Bridge 44 through Charoenkrung Road	Appendix Table 3.1 A
2. Surasak	Running from Silom Road to meet Sathorn Nua	do
3. Pramuan	Running from Silom Road to meet Sathorn Nua (similar to 3)	do
4. Rongmuang	Starting from Rama I Road through Rama IV (Hua Lumpong station)	do
5. Sunthorn Pimon	Currently Soi Sunthornphimol to Rama IV and Charoen Muang	do
6. Visudkasat (old)	A big road ran from Bangkunprom to Rajdanamnoen Nok	N.A.R.5.M. of Public Works9/67 (1905)
7. Siphaya	From Charoenkrung Road to Chalermdej 57 Bridge.	N.A.R.5 M. of Public Works9/100 (1908)

<sup>93</sup> Collected Law, no 18, p. 139.

<sup>94</sup> Department of Fine Arts, *A Directory Part II: Roads in Changwat Pranakorn and Thonburi*, Bangkok : Cremation Volume, 1962, p. 37.

<sup>95</sup> Department of Fine Arts, *Archives of Fattanakosin*, Bangkok: 1982, p. 81.

## Road construction, 1910-1925

Until 1910, new road construction helped transform the central areas into industrial, residential and commercial areas including Sampeng, Dusit, Sarapratum, Bangrak, Bangkoalam, Banglumpoo lang, the part of district of Bangsue west of Klong Premprachakorn and the district within the city wall.<sup>96</sup>

Between 1910 and 1925, however, few new roads were cut. Most road expenditure was on the extension and improvement of existing roads. Only six new roads were built:

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In 1917, three roads were cut within Tumbon Hualumpong. A main reason for road cutting in this area was fire prevention.<sup>97</sup>

**Road no 1** from Sam Yaek Hualumpong Nai and Krungkasem road (at Charoen Sawas Bridge) to Si Yaek Plubplachai and Wang Road. Its length was 23 sen 17 wa or 954 metres.

**Road no 2** from Charoenkrung road (at Song ward Road) to Road no 1, Sam Yaek Krungkasem Road and Luang Road (at Nobpawong Bridge). Its length was 17 sen 6 wa or 692 metres.

**Road no 3** from Plubplachai Road passing Roads No 1 and 2 to Krungkasem road. This road was 13 sen or 520 metres in length.

On 3 September, 1918, fire damaged a house at Tumbon Troktao hoo. The project of the cutting of three roads was proposed to help fire prevention.<sup>98</sup>

**Road no 1** from Charoenkrung Road at Rajawong Road to Luang Road besides the central hospital. Its length was 208 wa.

**Road no 2** from Worachak to Plubplachai Road (besides the southern part of Wat Mai Kanikaphol) through the new piled Chakkrawat Road to Road no 1 and Trok Tao Hoo Road (a new pile). Its length was 236 wa.

**Road no 3** from Klong Thom Chakkrawat Road to Plabplachai road (besides the Northern part of Wat Maikanikaphol). The total length was 149 metres.

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<sup>96</sup>N.A. R.5. M. of the Capital 5.4/10 (1908).

<sup>97</sup>N.A.R.6.M. of the Capital 21/36 (1917).

<sup>98</sup>N.A.R. 6. M. of the Capital 21/49 (1920).

### Why was road construction slow between 1910 and 1925 ?

Unlike his precedence, King Vajiravudh had little interest in the great progress of his capital or in seeking profitable investment through road extension. The PPB paid little attention in investment of land and row houses over the period 1910-1925. No records of large scale row house construction for rent collection in this period exist. One reason probably is that Rama VI spent a large portion of his personal budget for his own activities, especially travelling. The Ministry of Finance allocated the crown a private travelling money of 200,000 Baht per year in 1913-1915, but this sum was overspent in each of the three years by 49,138, 147,241 and 416,184 Baht respectively.<sup>99</sup> Rama VI not only spent a large proportion of expenditure for his own personal affairs but also was allocated a substantial state expenditure budget for the PPB and royal affairs. The government allocated expenditure for the PPB of 15 percent of the total government expenditure budget in the period 1910-1917, and 12 percent over 1918-1925.<sup>100</sup> Overspending continued until 1925 and was covered by the revenue derived by the PPB. This resulted in the PPB facing financial difficulties which, in turn significantly affected the rate of row house construction and other investments.

Furthermore, the slow development of road construction compared to the previous period was closely related with government financial difficulties. The government spent a large portion of expenditure for defence, royal affairs and public investment such as railways and irrigation.<sup>101</sup> In addition, government revenue decreased after 1919. Total government revenue in 1919 was 90.7 million Baht and significantly declined between 1920-1924 as shown below.<sup>102</sup>

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Year	Million Baht
1919/20	90.7
1920/21	80.3
1922/23	79.6
1923/24	81.6
1924/25	85.2

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<sup>99</sup>Thaveesilp Subwattana, "The Role of Privy Purse in Economic Investment (1900-1932)", *Thammasat University Journal*, Vol 14, no.2. June 1985, p. 138, based on N.A. R 6. M. of Finance 8.3/1 (1913-1915).

<sup>100</sup> Suntharee Asavai, *The Economic Crisis After World War I*, Bangkok: Thammasat University Press, 1990, p. 108.

<sup>101</sup>Works in Thai concerning the rapid growth of defence and royal affairs expenditure budget during 1910-1925 include Suntharee, *The Economic Crisis*, Pornpen Huntrakul, "The Government Spending During the Reign of King Rama the Sixth, A.D.1910-25", M.A. thesis, Chulalongkorn University, 1975.

<sup>102</sup>Wilson, *Thailand : A Handbook*, pp. 242-243.

One important reason for the decrease in government revenue was the great drought between 1917 and 1919, which obliged government to limit rice exports.<sup>103</sup> In addition, government lost revenue of around 51 million Baht between 1919 and 1921 through speculation on exchange rates. These losses were financed by Treasury funds of around 34 million Baht,<sup>104</sup> resulting in a decline in the balance available:<sup>105</sup>

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Year	Million Baht
1919	44.0
1920	25.3
1921	5.7
1922	8.5
1923	3.2
1924	10.2
1925	17.3

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Many if not most of Rama V's new roads were constructed not to serve existing traffic but rather to open up new areas. To this extent they were the beginning of a process of development: the development of buildings, branching lanes, and so on. The street infrastructure established before 1910 laid a pattern of new settlement and

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<sup>103</sup>Suntharee, The Economic Crisis, Table 10, p. 88.

<sup>104</sup>One source concerning economic and financial results of the rice crop failure of 1919 claimed in 1922:

However this may be, the fact has to be remembered that the crop failed completely over large areas of the country, and that the cultivating classes living in those areas were completely deprived of their usual means of sustenance, and reduced to a miserable existence more or less upon credit until the following harvest. The economic condition of these unfortunate individuals must have received a considerable set-back, from which it will undoubtedly take them a long time to recover. As regards the financial burden placed upon the government, it is still more difficult to arrive at definite figures. The first and almost obvious item is the sale of sterling which the Treasury has been forced to make in order to meet, particularly, the demands of the Banks for cover for remittances. Up to the end of March B.E. 2463 (1921) these sales had amounted to the large figure of 8,600,000 pounds odd, on which, of course, a loss of interest must be incurred until the sum is repurchased from the Banks. The interest on this amount, at the rate of 5 percent per annum, represents 430,000 pounds sterling, or Tcs.5,160,000 at the Treasury rate of exchange of Tcs.12= 1 pound sterling, and as it will probably be at least three years before the sum is recovered, loss of interest must continue for a further considerable period, though on a declining scale. It is obviously extremely difficult (besides being unprofitable) to attempt to estimate what the final figure of loss under this head will be, but the sum above mentioned, as one year's interest, will show that the amount will be a large one... It will thus be seen that, in one way and another, directly or indirectly, the financial consequences of the failure of the crop two years ago have resulted in a considerable strain on the public funds. This is particularly noticeable in the case of the almost entire depletion of the sterling resources of the Treasury, which had been built up gradually as a result of many years of careful finance and normal trade conditions. It is most sincerely to be hoped that no such calamity will again visit this country - at all events in the present generation. The fact that the failure of the crop occurred at the precise moment when world prices were at their highest, added very greatly to the seriousness of the economic position created thereby, but it is extremely unlikely that such an unfavorable combination of circumstances will ever arise" (N.A. Department of Railways 2/3 (1922)).

<sup>105</sup>Suntharee, The Economic Crisis, Table 11, p. 90.

commercial activity which was developed during the subsequent decades, and established a physical shape for the city which was still recognisable in 1950.

### **The economic significance of roads, 1890-1925**

Over 135 roads were built between 1890 and 1925, resulting in a major movement of people from water to land. Before 1900, a high proportion of residential, commercial and industrial land was concentrated along the banks of canals and the Chaophraya river. As roads were constructed by the 1920s, people moved from the banks of waterways to live along roads. Paddy fields, gardens and orchards were transformed to build homes and business offices. Trams introduced from the 1890s, further encouraged expansion in the suburbs. As a result, the total size of the city area expanded and new residential commercial and industrial districts emerged.

A good example of the impact of road construction on the growth of the city's area was the Suan Dusit project. Finished in around 1898, the Suan Dusit palace in the northern part of the city was regarded as the most beautiful of the king's palaces. Roads built around this palace in the 1900s included Rajadamnoen Nok, Rajadamnoen Klang, Rajavithee, Benjamas Nai and Somchin.<sup>106</sup> The construction of roads provided convenient communication between the grand palace and Suan Dusit palace. Roads also facilitated close communication and transportation to more distant districts such as Bangsua and Samsen.

We should not underestimate the influence of palaces and other royal residence on the growth of Bangkok. It may be recalled that Rama V had literally hundreds of children and grandchildren by the time of his death in 1910, and Rama IV had been similarly prolific. Palace construction and new road construction together went hand in hand.

A number of palaces were built within and outside the city walls after the late 1890s, for instance around Rajadamnoen Nok, Samsen road, Suan Dusit, Luang road, and at the corner of Patumwan road. As a result, the prosperity and settlement of communities earlier concentrated on the banks of the Chaophraya river extended to the north, eastern, and the southern part of the old city. The growth of palaces stimulated

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<sup>106</sup> Office of Royal Palace, *The Record of the Construction and Repairing Vimarnmek Palace, 1900-1975*, Bangkok: Office of Royal Palace, 1976, pp. 21-40.

state officials and others to construct houses around the palaces.<sup>107</sup> Some palaces in Tumbon Klong Padungkrungkrasem are given below.

A list of 13 palaces at Tumbon Klongpadungkrungkrasem in 1898

Name of palaces	Total area (wa square)	Cost of construction (chang)
Prince Kittiyakorn	6, 065	439
Prince Rapipattanasak	12, 467	181
Prince Prawattanakodom	12, 302	194
Prince Jirapratworadej	7,917	111
Prince Apakorn	11, 177	160
Prince Burachat	10, 311	193
Prince Pattanawong	9,454	175
Prince Wuttichai	5,459	102
Prince Diloknoparat	13,090	195
Prince Suriyong	13,091	212
Not decided	10,321	626
Not decided	13,519	225
The Lesser Concubine of the King (Pae)	146,619	3, 314

Source: N.A.R.5 M. of the Capital 18.1/49 (1897-1898)

The grand palace and other royal palaces were large. They constituted a substantial feature of the landscape of Bangkok in the 1890s, 1900s, and 1910s. For example, some were as follows:<sup>108</sup>

Names of palaces	Areas (wa square)
The Grand Palace	54,704
Saranrom	2,344
Dusit	56,720
Suan Sununta	48,855
Suankwang	12,506
Suankularb	24,740
Parusakawan	13,380

In summary then, Rama IV initiated a movement away from the river in the 1860s, eschewing boats in favour of horse and carriages. The process continued for the remainder of his reign and through that of the Fifth Reign as more roads and bridges were built. In 1893, the railway line was opened to connect Bangkok with Paknam, eliminating the need for a boat journey. By the 1900s, horse-drawn carriages were being replaced by electrified tram and cars, which further reduced the role of water transport.<sup>109</sup>

Bangkok's land development was noted recently by Steve Van Beek:

<sup>107</sup> Pussadee Thippawas, *Housing in Bangkok: Models and Changes in 200 years, 1782-1982*, Bangkok: Chulalongkorn University Press, 1982, pp. 117-118.

<sup>108</sup> N.A. Office of the Prime Minister 0201 94.5/1 (1931-32).

<sup>109</sup> Beek, *The Chao Phya River*, p. 62.



In the year 1900, King Chulalongkorn signalled even further movement inland by constructing a "summer" palace, Vimarnmek, north of the city and 2 kilometres east of the river. Nobles ensconced on Phra Athit Road and in Thonburi vied with one another to erect the grandest new mansions in the vicinity of Vimarnmek. In doing so, they exchanged a riverine setting, annual floods, boat transport, and cool breezes, for a land based existence with gardens and reduced floodings, and which favored the motor car and the roads it travels. It seems a subtle change but it had considerable impact on the way leaders henceforth viewed the river's role in Thailand's development.<sup>110</sup>

Between the 1900s and 1925, Bangkok became more urbanized and more extensive. In 1923, the built-up area included: (1) the old district in the city wall or the heart of the city, Sampeng and Pranakorn; (2) Suan Dusit, the bank of Samsen canal, Payathai and Patumwan; and (3) Bangrak, Siphraya and Silom.<sup>111</sup> Roads were powerful factors which generated change in the physical growth in Bangkok, especially, through the expansion of trade and business, the investment in row houses and the growth of land transport.

### **Road construction, 1925- the early 1930s**

The years between 1925 and the early 1930s saw a considerable road construction when compared to the previous 15 years. Roads were not only built in Pranakorn, but also extended to Thonburi and Nonthaburi. In 1932, Rama I bridge was built to connect between Pranakorn and Thonburi.

We may summarize some of the principal road buildings construction during the period of 1925 to the early 1930s in Appendix Table 3.2 A .<sup>112</sup>

### **Why was growth of roads spectacular between 1925 and the early 1930s?**

Even after the outset of the great depression, the new revolutionary government of 1932 was active in road building. Several reasons contributed to this spurt of road construction.

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<sup>110</sup> *Ibid.*, p. 62.

<sup>111</sup> *Collected Law*, no 36 (1929), pp. 100-101.

<sup>112</sup> Anonymous, *The Royal Duties of King Prachatipok*, Bangkok: Ruangsilp Publishing Office, 1977, pp. 322-324 based on the Annual *Collected Law* no. 43, 1930, p. 113; no. 45, 1932, pp. 258-59; no. 46, 1933, pp. 668-69; no. 43, 1933, pp. 185-87.

First, there was an expansion of settlement in more outer area of Bangkok. A list of road construction in Appendix Table 3.2 A indicates that some of new roads were built at more distant suburbs of Bangkok including Thonburi (mostly Bangkok noi and Bangkok yai) and Bangkhen. Appendix Table 3.3 A indicates that in 1930 Bangkok and Thonburi's population numbered 687,966 of which 511,315 resided in Pranakorn province and 176,651 in Thonburi province. These suburbs such as Bangkok yai, Bangkok noi and Bang Khen had been around 13,000 and 20,000 inhabitants. Moreover, a large proportion of land in these districts was used for residential commercial and industrial land, namely 1,966, 639 rai and 463 rai in Bangkhen, Bangkok yai and Bangkok noi respectively.

Second, the existence of economic activity was also important in creating demand for roads. For example, in 1920, almost 222,000 rai of land in Thonburi were paddy fields, gardens and orchards (Table 3.3 A). Roads were built to facilitate transport of agricultural crops, especially perishable fruits such as durian and oranges, from farm to supply the market for regular domestic consumption and for export at Bangkok. Furthermore, improved roads reduced operating costs of vehicles, thus increasing traffic and reducing freight rates. This stimulated business activities between Bangkok and Thonburi and the adjacent areas.

Third, growth of roads also came from the growing demand for infrastructure. For example, the case of Thonburi, there was inadequate infrastructure, such as roads, lighting, water. One official source from Revenue Department in 1928 said:

The question of the development of the West Bank of the river by extending to that area the amenities of life enjoyed by the East Bank is one of increasing urgency. The people living in that district are beginning to show signs of restlessness owing to the neglect they have suffered under, continuing from year to year. At a recent meeting of the railway board when an application for a concession to build a light-railway or tramway was discussed, I remarked that responsibility of the government for developing roads, lighting, water, etc, on that bank could not be put off much longer, and that the granting of the concession referred to in all its detail, should be considered and viewed from the point of view of the future policy of the government for that district, and suggested that an attempt might be made to find out what line that policy would follow.<sup>113</sup>

Fourth, road construction was demanded by the increasing role of the port of Bangkok. Rapid growth of shipping increased need for land transport to facilitate the movement of goods between port and city. Roads were feeders for waterways. Roads and waterways enhanced the port of Bangkok developing as the nation's major centre of internal and foreign trade. Table 3. 1 shows the growing significance of Bangkok's

<sup>113</sup>N.A. M. of Finance 0301.1.19/4 (1927-28).

port. The port developed on the large scale from the mid 1920s onwards. In 1865 there were only 305 ships cleared in and out of the port of Bangkok. This increased to 887 ships in 1874 and increased almost three times only 9 years later. From the mid 1890s onwards, the number of ships from various countries increased considerably, especially from the 1920s.<sup>114</sup>

**Table 3.11** Ships Cleared In and Out of the Port of Bangkok Classified According to the Nationality (1865-1934)

Period	Total	British	German	Siamese
1865	305 (100.00)	70 (22.9)	-	159 (52.1)
1869	903 (100.00)	319 (35.3)	126 (13.9)	314 (34.7)
1874	887 (100.00)	269 (30.3)	53 (5.9)	328 (35.9)
1875-1879	1,059 (100.00)	370 (34.9)	137 (12.9)	258 (24.3)
1880-1884	944 (100.00)	476 (50.4)	110 (11.6)	214 (22.6)
1885-1889	872 (100.00)	489 (56.0)	135 (15.4)	54 (6.1)
1890-1894	845 (100.00)	630 (74.6)	104 (12.3)	5 (0.6)
1895-1899	1,006 (100.00)	706 (70.2)	86 (8.6)	7 (0.7)
1900-1904	1,251 (100.00)	262 (20.9)	577 (46.1)	71 (5.7)
1905-1909	1,553 (100.00)	198 (12.8)	691 (44.5)	127 (8.2)
1910-1914	1,657 (100.00)	210 (12.7)	485 (29.3)	231 (13.9)
1915-1919	1,813 (100.00)	485 (26.8)	-	348 (24.7)
1920-1924	1,772 (100.00)	577 (32.6)	-	431 (24.8)
1925-1929	2,119 (100.00)	507 (23.9)	9 (0.4)	405 (19.1)
1930-1934	2,476 (100.00)	656 (26.4)	5 (0.2)	372 (15.0)

Sources: 1865-1909, N.A.B.P.P., *Diplomatic and Consular Report*, various issues; *Bangkok Calendar* annually, 1910-34; and *Thailand Statistical Yearbook* (various issues).

As a result, private wharves developed on a large scale along waterways. Wharves demanded roads as feeders for waterways. In the late 1920s, there were over 40 private wharves (Table 3.12).

<sup>114</sup> Foreign navigation was predominant at Bangkok's port between 1875 and 1932. The British shipping increased to 50.4 and 56.0 and 74.6 and 70.2 per cent of total in the period between 1880-1884, 1885-1894 and 1895-1899 respectively. From 1900, the number of British ships at the Port of Bangkok tended to decline with the increase of German ships until 1914. The superiority of the German shipping companies lasted until the outbreak of the First World War. In 1917, when the Thai government decided to enter into a military alliance with the British, all the vessels and assets of the German companies were seized and most of the shipping assets then belong to the Thai government (Photjana Luang-Arun, "Commercial Shipping and the Thai Economy (1855-1925)", M.A.thesis, Silapakorn University, 1980, p. 117). From around 1917, Danish, France and Japanese shipping increased their share of the total shipping at the Bangkok's port.

Table 3.12 The Wharves in Bangkok in the late 1920s

Western Side	Eastern Side
Siam Petroleum Co Wharf	Anglo Siam trading Corp
Standard oil Co.	no name
Yit Lee Chin Kee R.M.	Borneo, Co.S.M.
Hong Long Huat R.M.	East Asiatic Co., Ltd
Chin Seng Chan R.M.	(no name) R.M.
Asiatic Petroleum Co	British India Steam Nav. Co
do do	do Godowns Wharves
Kwang Guan Lee, R.M.	Lim Heng Chuan R.M
Kwang Hong Seng	Guan Lee Chuan R.M
Arracan Co.	Kwang Teck Seng R.M
E. Heng	Heng Teck Seng R.M
Siang Heng Long R.M.	Lee Khoon Seng Wharf
Kwang Hap Seng R.M.	Lee Khoon Seng Wharf
Siam Seng Long R.M.	Kwang Seng
E. Heng Chiang R.M.	Ngow Hock Shipping Wharf
Long Heng Lee R.M.	Borneo Co's New Wharf
Guan Chiang Lee R.M.	Borneo Co's old Wharf
Guan Heng Lee R.M.	Borneo Co wharf
Hock Lee R.M.	Bangkok Dock Co.,
Chia Seng Chan R.M.	Chino Siam S.S. Co.,
Lee Tit Guan R.M.	Hock Hoa R.M.
Kwang Yoo Seng R.M.	Indo-Chine, S.S.Co
Siang Hoa Long R.M.	Kim Seng Lee R.M.
Guan Chiang Seng R.M.	Kiam Lee Chan
Wang Lee Wharf	
The Naval Coal Wharf	
The Naval Dockward	

Source: *The Directory for Bangkok and Siam for 1929*, Bangkok: The Bangkok Times Press p183.

Note: There were also wharves outside the harbour limit. Below southern limit: Kim Tye Seng R.M. wharf just about 1/5 miles on the west side. Above Northern harbour limit: Guan Tit Lee R.M. wharf just above the limit on the east side. Kim Guan Seng R.M. wharf about 1 mile on the east side.

Fifth, the buildings of roads were demanded by a growing industrial activity in the 1920s and 1930s. After the outbreak of World War I, some modern machinery was brought into Bangkok by foreign investors, and a number of plants were set up including British-American Tobacco Company, soap factories, coconut oil and bean oil, textile factories, waterworks and power stations.<sup>115</sup> At the same time, the state became directly involved in some industrial enterprises in the 1920s. The Army imported experimental paper making equipment at Tumbon Samsen with the daily production capacity of about 1 ton.<sup>116</sup> Afterward, the government also ran the Bangkok waterworks, and the Samsen Power station.<sup>117</sup>

<sup>115</sup>Anonymous, "Khon Cha tung Niyom Thai" in *Silapawattanatham*, Vol 1, no 7, November 1985, p. 74.

<sup>116</sup>*Ibid.*, p. 74.

<sup>117</sup>*Ibid.*, p. 75.

In the late 1920s, there were several factories in Bangkok, big and small, for making nails, soap, tobacco, fireworks, bricks, medicines, and matches as well as for tanning leather, furniture-making, boot and shoe-making, boat-building, and tailoring.<sup>118</sup> A match factory, The Min Sae Co. Ltd was registered by a group of Chinese in 1928, with a capital of 200,000 Baht. The Min Sae factory opened on 20 rai site on Rama IV road, employing some 700 workers, 600 of whom were day labourers, most being Chinese women and children, with Siamese employed as outworkers making boxes at home. A reporter described the complicated automatic machinery, partly driven by electric motor and partly driven by hand. The company hoped to capture 20% of the local market. The Siam Match Factory was opened in 1931 by the Swedish Match Company in partnership with the Borneo Company. Work continued for 24 hours, in two shifts, with 325 labourers on the day shift and 225 at night. Most of work was automated with Siamese workers being employed on a piecework basis.<sup>119</sup>

Sixth, the railway system, leading from Bangkok towards the provinces demanded roads as feeders. The first railway was a private line built from Hualumpung to Samut Prakarn in 1893. Further railway construction was undertaken by the Thai government. The line from Bangkok to Korat was opened in 1900. Following the year 1900, the railroad network developed in all directions out of Bangkok as shown by Table 3.13 ( Map 3.4 ).

**Table 3.13** Railway Construction in Thailand, 1900-1930

Year	Line	Length(km)
1900	Bangkok - Korat	264
1901	Ban Pachi - Lopburi	43
1902	Bangkok(Thonburi) - Phetchaburi	150
1905	Lop Buri - Nakhon Sawan	117
1907	Bangkok - Chachoengsao	61
1917	Extension Korat - Ubon	n.a.
1918	Southern line - Badungbesa	n.a.
1921	Southern line - Sungaikolok	n.a.
1924	Easternern line - Kabinburi	100
1926	Eastern line - Arunyaprdej	94
1926	Ban Phachi - Chiang Mai	661
1930	Korat - Ubon Ratchathani	312
1930	Completed King Rama VI bridge and connected the southern line to another line	

Source: Adapted from Siriboon Naodinsuk, "An Economic Analysis of the Railways Authority of Thailand " in **the States Enterprise of Thailand, Past, Current, and Future**, A Paper Presented at Annual Symposium, The Faculty of Economics, Thammasat University, 26-27 January, 1984, pp. 5-(2)- (7).

<sup>118</sup>Anonymous, Siam Resources, p. 27.

<sup>119</sup>Kevin Hewison , "Industry Prior Industrialization :Thailand" ,Paper Presented at the Conference on Industrialisation Elites in Southeast Asia,Sulthothai, Thailand,8-12 December,1986, p. 10.

Between 1925 and the early 1930s, some roads were built or improved as feeders for railways in the suburbs of Bangkok, Laksi and Donmuang, all on the train routes for the populous provinces of the centre, north, and northeast. To facilitate trade between Bangkok and the provinces, it was of vital importance, therefore that served roads were constructed and improved to provide missing links in the communication from Bangkok to the centre, the northeast and the north provinces. Road transport linking railway stations encouraged the movement of truck-hauled goods including rice, perishable produce, charcoal, salt, sugar and other materials.

Railway construction provided convenient and quick transportation. Railways carried both luxuries and necessities from Bangkok to the provinces. Again, road construction in Bangkok as feeders for railways was necessary to facilitate the movement of goods.

#### **The economic significance of roads, 1925- the early 1930s**

Roads were determining factors in the development of land for business and residential areas. No statistics of land use exist prior to 1930. In that year, the residential commercial and industrial area was concentrated in Pranakorn province particularly in four Amphurs (Table 3.3 A) :

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Pranakorn	81,834
Sumphuntawong	67,669
Bangrak	53,712
Pomprab	53,458

---

Chinese immigrants contributed the large share of population in those districts. Density was high: Pranakorn at 37.6 persons per rai, Sumphuntawong 93.7, Bangrak 25.9, and Pomprab 53.4. These districts had little land devoted to paddy fields, garden or orchards unlike the outer districts such as Bantawai, Bangsua, Phrakhanong, and every district in Thonburi. Pranakorn province also had a greater density of roads (and canals) than Thonburi province (Table 3.3 A).

One of the major changes in Bangkok in the late 1920s was the growth of suburban districts. Economic activity extended out from the central business districts such as Sumphuntawong, Pranakorn, Pomprab, Patumwan, Nang Lerng and Bangrak

to more and more suburbs, including Klongsarn and Bang Yee Rua in the early 1930s, as indicated by the number of business tax assessments (Table 3.14).

**Table 3.14** Number of Business Tax Assessments in Bangkok in 1933

Amphurs	Number of Assessments
Phranakorn	738
Samphuntawong	1, 777
Pomprab	479
Bangrak	397
Ban Tavoi	77
Pratoomwan	132
Nang Lerng	138
Dusit	49
Bang Sue	64
Phra Khanong	22
Bangkapi	5
Minburi	1
Laad Krabang	3
Nong -chok	4
Bang Khen	4
Bangplad	4
Bangkok Yai	17
Bukalo	8
Bangkok Noi	2
Bang Yee Rua	60
Klong Sarn	72
Rasburana	8
Pasri Chareon	13
Bang Khoon Tien	7
Talingchan	7
Total	4, 153

Source: N.A. M. of Finance 0301.1.1/8( 1927 - 1929) (This source includes the above data for 1933).

Note: Spelling is from the original text.

### Waterways and the growth of Bangkok, 1900-1932

The road development we have considered were imposed upon a city pattern already established through the distribution of waterways. Sternstein has made very clear the continuing significance of waterways before the 1930s<sup>120</sup>, and Thompson and others have confirmed the point.<sup>121</sup> Carter published figures of the number of boats passing certain points during a five day period in 1904:

Damnoen Saduak Canal	3, 163	Boats
Pravet Canal	2, 291	Boats
Saen Saeb Canal	5, 302	Boats
Rangsit (Lock Gate)	2, 978	Boats <sup>122</sup>

The Pasri Charoen gave the number of 9, 851 boats (a seven days' reckoning).<sup>123</sup>

<sup>120</sup> Sternstein, *Portrait*, p.89.

<sup>121</sup> See Virginia Thompson, *The New Siam*, New York: Macmillan, 1967 ;and Hubbard, "Canal Construction".

<sup>122</sup> Carter , *The Kingdom of Siam*, pp. 229-34.

<sup>123</sup> *Ibid* ., pp. 229-34.

Waterways dominated rice transport. In 1929, the Ministry of Commerce recorded that 786,901 kwien of rice arrived in Bangkok by water as compared to 121,656 by rail.<sup>124</sup> Even in the 1930s, despite the existence of a railway network amounting to some 4,000 miles, more than 80 percent of export rice was carried by water from the interior to the rice mills.<sup>125</sup>

Waterways greatly influenced Bangkok's physical change. The location of rice mills in Bangkok (and the provinces) was almost always at the edge of canals and rivers because of the advantage of low cost transportation, and easier access to port facilities in Bangkok. The location at the edge of canals and the river was convenient to transport paddy rice from the producing areas to mills in Bangkok.

At the early stage of the development of rice mills between 1858 and the 1870s, rice mills were mainly concentrated in Bangkok. Later rice mills also appeared in some provincial areas. A study done by Tanom Tana indicates that there were 5 rice mills in Bangkok and its adjacent area located at the edge of the Chaophraya river and the network of canals before the 1870s. The location of rice mills in Bangkok remained unchanged until the outbreak of World War II. For example, in 1898, some 37 rice mills operated their business in Bangkok, of which 30 rice mills were concentrated along the banks of the Chaophraya river. From 1908 to 1919, rice mills increased from 50 to 57. More than half of the total rice mills were located along the banks of the Chaophraya river, with most concentrated in the areas between Banglumpoo and Bangkrabua.<sup>126</sup>

The expansion of rice mills gradually extended from Bangkok to outer provincial areas for example, Ayuthaya, Angthong, Pathum thani, Prachin Buri, Nakhon Pathom, Suphan Buri, Samut Sakhon, Ratchaburi, Petchaburi. Most of them were located along the river routes to Bangkok and its adjacent provincial areas. For example, rice mills in Chachoengsao were located along the Bangpakong river, Nakhon Pathom at Tachin river, and Suphan Buri at the Suphan river.<sup>127</sup> The following was an excellent description of canal transport serving of trade between Bangkok and the provinces, by A.E. Steven, Manager of the Borneo Co Ltd, rice mills in Bangkok, in 1908:

<sup>124</sup>N.A.R.7. M. of Commerce 8.1/1929.

<sup>125</sup>Falkus, "Early British Business" p. 125.

<sup>126</sup>Tanom Tana, "The Rice Mills Business in the Central Thailand, 1858-1938", M.A. thesis, Silapakorn University, 1984, p. 42 based on N.A.R.6 M. of the Capital 31.3/12 (1919).

<sup>127</sup>*Ibid.*, p. 47.



Every description of boat may be seen on the Menam and there is a variety used for carrying paddy. For transport from the place around Bangkok only small boats, carrying 5 to 15 tons are employed, but for more distant places larger craft are engaged, some of which will carry from 30 to 35 tons... These boats will sometimes spend three or four weeks on one trip, covering a distance of a hundred and fifty to two hundred miles... These large boats drew 6 to 8 feet of water, but when empty only about 2 feet.<sup>128</sup>

Until the late 1920s rice mills were still mainly located along the banks of the Chaophraya river and canals. Mills were extended to the provincial areas where waterways were connected (Table 3.15). All these mills were located with direct waterway access to Bangkok.

**Table 3.15** Statistics of Rice Mills in the Central Plain, 1908-1929

Changwat	Establishment Year (1908-1919)	Establishment Year (1920-1929)	Total
Bangkok	57	9	66
Samut Prakarn	3	12	15
Nonthaburi	5	16	21
Minburi	1	14	15
Prapradaeng	-	11	11
Ayutthaya	26	36	62
Saraburi	-	25	25
Lop Buri	2	21	23
Ang-Thong	4	15	19
Pathum Thani	4	7	11
Sing Buri	-	8	8
Thunyaburi	1	7	8
Chachoengsao	8	25	33
Chon Buri	1	26	27
Prachin Buri	-	12	12
Nakhon Nayok	-	10	10
Nakhon Pathom	5	42	47
Suphan Buri	16	17	33
Samut Sakhon	3	13	16
Ratchaburi	1	43	44
Phetchaburi	2	15	17
Kanchanaburi	-	2	2

Source: Adapted from Tanom Tana "The Rice Mills Business in the Central Plain Thailand, 1858-1938", M.A. thesis, Silapakorn University, Table 1, pp. 45-46, based on N.A. Personal File 2.41/2 (1929).

The water markets located along canals and the Chaophraya river remained of importance in Bangkok until the 1940s. Many merchants would carry fruits, food, and

<sup>128</sup>A.E. Stiven, in A. Wright and O.T. B. Cockspear, *Twentieth Century Impressions of Siam: Its History, People, and Resources* (1908), Reprinted by White Lotus, Bangkok, 1994, pp. 145-146.

other articles from orchards and market gardens in Thonburi and Nonthaburi to moor at water markets in canals such as Klong Banglumpoo Bon.<sup>129</sup>

### **Why were roads in Bangkok inadequate?**

Though a number of road construction were undertaken in Bangkok between 1890 and the early 1930s, roads in Bangkok were inadequate and remain so to the present day. In 1930, the road area formed not more than 5 % of Bangkok's total area (Table 3.3 A). The limited extent of roadways was a product of many factors.

First. Building construction first extended alongside canals and then extended by filling in the canals. Many side-roads were originally small cuts of the main canals running into rice fields and gardens, with no exit.<sup>130</sup>

Second. Much road construction was closely related to the Privy Purse's investment in row houses. Thus by the 1920s most of the roads in Bangkok were concentrated in a few areas, namely Pranakorn, Sumpuntawong, Bangrak, Pomprab, Nanglerng and Dusit, where the rate of money return was high. Thus, there were a number of private benefits derived from road construction. At the same time, some districts like Talingchan, Bangyirua, Frakhanong had an extreme lack of roads.

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<sup>129</sup>Tud Phrommanob, *The Geography of Bangkok*, Bangkok: Thammapitayakarn Publishing Office, 1931, p. 73.

<sup>130</sup> Falkus noted: "This leads to the implication for current traffic problems. In conclusion, one could suggest that some of the problems i.e traffic congestion, and air pollution, which afflict Bangkok today arise from the lack of roads. At present roads form around 8% of Bangkok's total area, whereas in cities such as London, New York and Paris they form 20-30%. Bangkok has always had a dearth of roads, arising from its earlier water-borne character" (Falkus, "Bangkok: From Primate City", p. 162). Historically speaking, when King Rama I chose Bangkok for the capital of Thailand, it was because the site was bounded by a big loop of the river on one side, and by swampy land on the other, and thus would be easier to defend than Ayuthaya had been. The whole area was water. As palaces and temples were built on the more easily re-claimable patches of land, they were connected by canals. People, of course, dwelled by the floating markets and along the banks of the canals. As the area was gradually drained, and more and more of it became solid land, Bangkok came to resemble a collection of hamlets connected to the man made waterways. Thus, when the time came to draw up a road plan, the prime locations were already tied together by canals. Then the roads naturally tended to follow the canals since they took the shortest distance between any two points, to save the boatmen's aching muscles (Investor, May, 1970, p. 436). Many of the existing roads in Bangkok were constructed alongside canals and then extended by filling in the canals. At present, traffic congestion certainly is one of the most conspicuous of Bangkok problems.

### III ROAD ADMINISTRATION

#### Financing road construction

Prior to 1892, all revenues were the King's personal income, and were in turn allocated by him to such purposes as defence, salaries, and public works. For example, Rama IV spent his own money in constructing BumrungMuang Road. For the construction of Charoenkrung Road the money came from two years' revenue from the poll tax on the Chinese as recorded by a royal proclamation:

By the royal command all Chinese who had to pay taxes to help affairs of the kingdom were hereby informed that the taxes for the year of the cock were allocated to construction of Charoenkrung road ... and for construction of Bumrungmuang road, the King gave his money to hire Chinese and bought bricks. . For Bumrung Muang road, the money spent on its construction was his money not Chinese poll taxes.<sup>131</sup>

Sometimes the funds for maintenance of roads came from donations from general public either in cash or in material for construction such as the public donation of bricks for the maintenance of roads in the reign of Rama IV.<sup>132</sup>

Data on size of expenditures and sources of finance of road construction in Bangkok between 1890 and 1932 are scant and not systematically collected. Based on the available data, the building of roads in Bangkok was financed by these broad categories of source: (1) the King donation; (2) the Privy Purse Bureau revenue; (3) private donations; and (4) income from taxes.

In 1892 Rama V separated the government income out from the King's personal income. Henceforth the expenditure needed to provide public services was derived from central government income. Taxes were raised for the specific support of public services as well as for the support of the royal family. The Ministry of Finance was established in 1892. All ministries had to submit budget estimates to the King and cabinet each year. Systematic budgets for road construction and maintenance dated from 1892. At that time the agencies responsible for road cutting were the Ministry of the Capital, the Ministry of Public Works and the Privy Purse Bureau.

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<sup>131</sup>Government Gazette Proclamation of Rama IV, Vol 4.

<sup>132</sup>Proclamation of Rama IV, 1856.

Government road expenditure could be broadly categorised into two parts. The first part of the budget was allocated to compensate the value of land or buildings which were affected by the construction of roads, and the second part was the expenditure on land purchase and the total cost of construction. Compensation was made on two bases. In the first case, if the land was partly lost by roads cutting and in turn, the owner of the land could gain in terms of a rise in the price of land, the land owners were not compensated, but must contribute to the cost of a road construction. Secondly, if land was totally lost by roads cutting, land owners were fully compensated at market price.<sup>133</sup> Rama V himself observed that:

Capital on road construction was derived from taxes paid by all people all over the whole country, but spending on road building was undertaken in a particular area, thus providing benefits to that locality more than others and this is unjust for citizens in other localities.<sup>134</sup>

To solve this problem, land adjacent to where the roads were built was purchased, and after construction of the roads, was sold back to the owners at the price of the origin land plus proportional amounts added to cover costs of construction. In many cases the land owners had to make grants for road construction, if the roads would bring benefits to them.

With respect to government expenditure budget on the road construction in Bangkok, figures are presented in Table 3.16 below.

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<sup>133</sup>Nij, "Roads in Bangkok," p. 25.

<sup>134</sup>Government Gazette, Vol 16, 1899, p. 276.

**Table 3.16** Selected Estimated Road Construction Expenditures ,1861-1898

Name	Total Expenditure (Baht)	Sources
1. Charoenkrung (1862) [second part]	19,700	Nij , "Roads in Bangkok" p 18
2. Bumrung Muang (1863)	15,302	<i>ibid.</i> ,p 18
3. Fuangnakorn (1863)		
4. Preatimas (1884)	55,522	Sayomporn, "the Impact" ,p51
5. Rajadamnoen Klang ( 1902 )	758,518	<i>Ibid.</i> , p.110**
6. Unakorn (1898)	8,300	Piyanart , "The Development" p .24
7. Larn Luang (c. 1902 )	21,150	N.A. R.5 M. of the Capital 5.4/5 (1902-1903)
8. Lookluang(c.1902)	6,640	do
9. Damrongrak(c.1902)	16,911	do
10. Panieng (c. 1902)	16,278	do
11. Krungkasem (c.1902)	8,000	do
12. Visuthkasat(c. 1902)	74,360	do
13. Roads from the end of Lookluang (c.1902)	7,611	do
14. Sanam Krabua (c.1902)	27,342	do
15. Road at the end of Sang Hee road (c.102)	5,403	do

\*\* Note: 236,607 Baht for road construction cost; 522,011 Baht for the purchase of land and building.

\*\* \*Note: 89,691 Baht for road construction cost; 24,393 Baht for the purchase of land and building.

The question of who should pay for roads in the long term remained unsolved. We have no information concerning any criteria that were followed, for example, the benefit principle or ability to pay principle. Road revenue raising was arranged piecemeal, with each road constructed separately. There is an interesting observation on the financing of Bangkok's road in December 1927. It was written by Sir Edward Cook, Financial Advisor to the Ministry of Finance, and forwarded to the Revenue Department:

Nevertheless, the condition of the Bangkok roads (though it has perhaps slightly improved during the past year or so) cannot be regarded as creditable to the capital city of a prosperous and progressive country... The roads are, of course, very much worse where the traffic is at all considerable than in the less frequented areas.

Bangkok already absorbs (so it is contended) a proportionate share of the general revenues, and it is not fair that taxes payers outside Bangkok, the vast majority of whom are people of very humble means, should contribute toward the amenities of those fortunate beings who live in the capital. Those who hold this view would maintain that the interests of the country at large, where so much requires to be done, have a prior claim on any surplus funds that the government may now possess.

One of the most pressing needs of the moment is, however, said to be for additional expenditure on roads; more particularly, expenditure of a non-recurring nature, in order that properly asphalt roads can be laid down, which will not only mitigate the plague of dust which seems to be endemic in Bangkok, but will also, in the long run, pay for itself by reducing maintenance charges.

I suggest that the most suitable as well as the most simple, means of raising new revenue (to finance the road construction) is to increase the taxation on motor cars. At present the owners of private motor cars pay only 12 Baht a year, which is absurdly small. As I have mentioned, the number of cars must have increases enormously in the past few years, a fact which of course has added a great deal to the wear and tear of the roads.<sup>135</sup>

This indicates that around the late 1920s road construction was financed by revenue from the central government. Expenditure on road construction therefore came from tax payers from the whole kingdom. This financing criterion was unfair for the mass of Thai citizens for the roads benefited only Bangkok.

#### IV

### Some Economic Consequences of Road Construction

#### Land and row house investment

When roads were built in various places in Bangkok, it was found that the price of land increased, and this attracted the elite and the PPB to invest in land and land related business for example, market places and row houses (Hong Taew). A survey of price of land in Bangkok in the first decade of the 20th century shows that the price of land was highest in the areas where roads were cut (Table 3.17).

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<sup>135</sup>N.A.M. of Finance 0301.1.19/4 (1927-1928).

**Table 3.17** Price of Land in Bangkok, 1905- 1911, Unit: Baht per square wa

Year	I: Land adjacent to road cutting [name of roads]	Year	II: Land not adjacent to road cutting
1905	20 Charoenkrung	1905	12 Tumbon Silom
1905	293 Suriwong	1908	2 Tumbon Silom
1908	160 Rajawong	1909	20 Tumbon Silom
1910	450 Rajawong	1910	30 Tumbon Rimboonklongsilom
1910	300 At the angle of Sampeng Road and Trok Kaosarn	1910	50 Tumbon Tanon Pahurud
1910	170 Chakkrawat	1911	59 Tumbon Trok Sibbia
1910	400 Sampeng	1911	2 Tumbon Bangpraekaw
1911	300 Luang	1911	6 Tumbon Bangrak
1911	160 Charoenkrung	1911	18 Tumbon Wat Yuan Khumloki
1911	300 Talard Kaosarnsarnsarn Road	1911	12 Tumbon Banknanghong
1911	500 Rajawong	1911	12 Tumbon Bangprakok
1911	350 Songward	1911	98 Tumbonnawat Sungwejwisayaram
		1911	35 TumbonSarn Chaokao
		1911	50 Tumbon Rimtanonluang
		1911	60 TumbonTalard Nanglerng
		1911	4 Tumbon Tung Banmai
		1911	2-6 Tumbon Bangsua
		1911	2 Tumbon Samsen at The Northern Part
		1911	10 Tumbon Hualumpung
		1911	20-30 Tumbon Trok Wat Phrayakrai
		1911	2 Tumbon Bangpong

Source: N.A.R.6 M. of the Capital 15.2 no1(1909); N.A.M. of the Capital 15.2no.2 (1909-1910); and N.A.M of the Capital 15.2 no3 (1913).

Figures of land prices indicate that prices rose considerably along the edge of roads such as Charoenkrung, Sampeng, Rajawong. As seen, in the above Table, when we compare well and poorly- situated land, the price of land in some adjacent areas was higher by as much as 250 fold. For example, in 1911 price of land at Talard Kaosarn Sampeng road was 500 Baht per square wa, while price of land was 2 Baht per square wa at the northern part of Tumbon Samsen. Bangkok's commercial development and

prosperity expanded whenever roads were cut, for instance along the edge of the south Charoenkrung road, Siphraya, Bai rak, Silom, Suriwong, Sampeng and Pomprab. Trading companies and merchant residences were mostly located at the main roads. Thus the traditional city plan of Bangkok which consisted of city moats and a complicated network of canals underwent a marked change to land-based building since around 1900.

The PPB was formally established as an independent department within the Ministry of Finance [Phraklang] in 1890. Prior to this, the PPB or formerly the Phra Klang Khangthi was established during the reign of King Rama II. It was known as "*Ngoen Khang-thi*" but its name was changed to "*Phara Khlang Khang-thi*" during the next reign. This organization was the king's personal institution. He was able to manage money to allocate to his own interests. During the reign of King Rama IV, 5 percent of the total state revenue, around 2,000 chang (160,000 Baht), was regularly allocated to the PPB, together with the extra revenue from the land tax, another 2,000 Chang (16,000 Baht).<sup>136</sup> In 1890, 15 percent of the total revenue was allocated to the PPB.<sup>137</sup>

### **The Privy Purse Bureau and Bangkok's development.**

The PPB acquired land in various ways.<sup>138</sup> It was able to occupy public land, including unused land belonging to government Ministries, unused palaces, and unused land conferred on government officials.

Land was also obtained through reclaimed mortgage. The PPB often lent money on mortgage. Major customers of the PPB who mortgaged land and real estate were Chinese tax-farmers, aristocrats and senior bureaucrats. When borrowers were not able to pay their debts, the properties were transferred to the PPB. For example, a plot of the PPB land around Tawejnaremitre Bridge (5,321 square wa) had previously belonged to Chaophraya Tawej who failed to pay a debt of 40,000 Baht in 1910.<sup>139</sup> Chaophraya Surawongwattanasuk bought land beside Talard Hualumpong (23,159 square wa) and mortgaged it with the PPB for 160,00 Baht. Chaophraya Surasakmontri

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<sup>136</sup>Thaveesilp, "The Role of the Privy Purse" pp. 124-128.

<sup>137</sup>N.A.R.5 M. of Finance 9.1-1 (1892).

<sup>138</sup>Orathip Tessiri, "Land Holding in Thailand from 1901 to 1932: A Case Study of Monthon Krungthep", M.A. thesis, Chulalongkorn University, 1981, pp 10-13. For a comprehensive study of the investment of the Privy Purse Bureau up to 1932, see, Chollada, "The Privy Purse".

<sup>139</sup>N.A.R.5. M. of Finance 9.2/14, no 76/1003.



bought land (23 rai) and a house at Tumbon Saladaeng, and mortgaged it with the PPB for 2,755 Chang and 42 Baht (220,442 Baht).<sup>140</sup> In both cases, the properties were transferred to PPB when the mortgagées were unable to repay the loan.

The PPB could also directly buy land from ordinary people and always had the advantage in terms of obtaining information on road cutting, the price of land, the advantage of land location and so on. Under the circumstances, the PPB acquired many plots of land established at good locations and commercial centres. As a result, the PPB investments in markets and row houses grew in the quarter century before 1910 in the main commercial centres such as Bangrak, Rajawong, Suriwong, Patumwan, Pahurad, Sampeng, Samsen, Banglumpoo. As a result of occupying and buying land in various parts of Bangkok, the PPB then controlled both prime commercial land and valuable cultivated land in the districts shown in Table 3.18

**Table 3.18** Land Owned by the PPB Classified By Commercial Districts in Bangkok in 1902

Amphur	Tumbon	Land Acquisition (rai)
Sampeng	Pomprabsatroopai, Saiyawd, Samphuntawong, Chakkrawat, Patumwai	1,831
Bangrak	Sathorn, Bangkwang, Ban Tawai	458
Within the City Wall	WatChanasongkram, Parajawang, Sumranraj, Pahurad	86
Dusit	Bangkunprom, Nang Ierng, Samsen	1,708
	<b>Total</b>	<b>4,085</b>

Source: N.A.R.5 M. of Agriculture 6/6153 (1903).

As the largest and most important land owner in Bangkok, the PPB was a contributing factor to the growth of Bangkok, influencing road cutting, land use, investments in row houses and markets. Some roads built had been heavily influenced by the King and the PPB. The buildings of roads and row houses went hand in hand. For example, the Privy Purse Bureau advanced money to purchase a plot of land to build row houses, and then demanded road cutting nearby or through their land to increase the price of land and its properties. It is recorded by King Chulalongkorn's handwriting in 1901 as follows:

<sup>140</sup>N.A.R.5. M of Finance 8.1/39 (1897).

Chakkri Mahaprasas

4 November 1901

No 26/1001

Dear Prince Naresworarit

In dealing with a purchase of a plot of land to construct road and the buildings [row houses] in the back of Talard Sao Chingcha, this should be done as soon as possible. The construction of row houses was almost completed in this year.... So road construction in this area should be completed very soon. The expenditure budget for purchasing a plot of land belonged to the Privy Purse Bureau, while cost of road construction was financed by another departments....

(Signature)

Chulalongkorn.<sup>141</sup>

We should consider further the impact of road construction on row house investment. When new roads were completed from the 1860s until the early 1930s, a number of row houses along both sides of roads were built and the largest owner throughout the years 1890-1932 was the PPB, although it should again be emphasized that quantitatively only from 1890 did the PPB investment become significant. Row house investment was closely related to the land investment of the PPB. Construction of row houses for rent and sale was first undertaken in the 1860s when Charoenkrung road was completed. When Prince Damrong was 6 years old, his father ( Rama IV) gave him a 2-room row house development at the edge of Charoenkrung from which he earned rent collection of 4 Baht a month.<sup>142</sup> The construction of row houses was undertaken along major roads in the main commercial districts, in Sampeng, Yaowaraj, Pahurud, Charoenkrung, and FuanḡNakorn. The first available figure of row house building can be obtained from the postal census survey in 1883. Unfortunately, some parts of the postal roll in the National Library in Bangkok are missing. The available data of row house statistics at FuanḡNakorn road indicate that 83 of 315 households resided at the Privy Purse Department's row houses and 94 of them dwelled at private tenements.<sup>143</sup>

We have scattered market transactions which give a picture of growing activity in the twenty years or so before 1910:

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<sup>141</sup> Office of the Prime Minister, A Collection of King Chulalongkorn's Manuscripts, p. 129.

<sup>142</sup> DamrongRajanuparb, Sarnsomdej, Vol 22, Bangkok: Kurusapa Press, 1962, p. 73 cited in Sayomporn, "The Impact", p. 32.

<sup>143</sup> Takashi, Reminiscences, p. 27 and 29, based on the postal census survey in 1883, list of residents following a road and a lane in Bangkok for a postman since the year of sheep, 1883, vol 2, pp. 204-224.

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In 1892, the PPB had 63 row houses for rent collection along the edge of Bumrung Muang road.

In 1899, the PPB bought markets and row houses of Krommuan Putharesthumrongsak whose properties were transferred to the Ministry of Finance according to loss of mortgages. There were 134 row houses constructed.<sup>144</sup>

In 1899, the PPB bought a group of Oriental buildings along the banks of the Chaophraya river. Total value was 375,000 Baht. This amount of expenditure was allocated to repair the building of 24 additional row houses.<sup>145</sup>

In 1900, the PPB had 215 row houses around the edge of Samsen Road, and 239, 133 and 17 row houses around the edge of Sangheenok road, Duangduan Nok (Sukhothai road), and Daokang road respectively.<sup>146</sup>

In 1902, the PPB constructed 140 row houses at Sampeng, Pahurud, Plublachai, Chakkrawat, and Hualumpong.<sup>147</sup>

In 1902, there were some 616 row houses constructed by the PPB in Suan Dusit area.<sup>148</sup>

In 1909, the PPB had a plan to construct hundreds of row houses around Tumbon Samsen.<sup>149</sup>

In 1910, the PPB bought 20 row houses at the edge of Charoenkrung road from Kromkhunsabprasart Suphakit at a price of 96,000 Baht.<sup>150</sup>

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We have no complete data on row houses in Bangkok belonging to the PPB or private undertakings, but the Table 3.19 provides some idea on the rapid growth of land-based housing.

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<sup>144</sup>N.A.R.5. M. of Finance 9.4 ng/11 (1900).

<sup>145</sup>N.A.R.5. M. of Finance 9.4 ng /11 (1900).

<sup>146</sup>N.A.R.5. M. of Finance 4.1/24 (1903).

<sup>147</sup>N.A.R.6 M. of Finance 1/64 (1912).

<sup>148</sup>N.A. Office of Royal Secretariats N.58/2 '2 no. 120/1172 ( 1902).

<sup>149</sup>N.A.R.5. M. of Finance 4.1/24 (1903).

<sup>150</sup>N.A.R.5. Office of Royal Secretariats n.s. 1.3/ (1910).

**Table 3.19** A List of Housing in Bangkok Located at some Major Roads in Bangkok in 1901

Road Names	No.Tile House	No.Zinc House	No. Thatch with stap leaveshouses
Charoenkrung	244	212	211
Fuang Nakorn	77	153	259
Bumrung Muang	182	170	137
Pahurud	79	128	193
Roads out of the city wall(1)	428	430	562
<b>Total</b>	<b>1,010</b>	<b>1,093</b>	<b>1,362</b>

Source: Adapted from N.A.R.5.M.of the Capital 5.5/5 (1901).

Note:(1) Roads out of the city wall covered a road running from the mount of Ong Ang canal to Banglumpoo canal stretching to the eastern part of the Chaopraya river to the mount of Ong-Ang canal again.

Table 3.19 shows how Bangkok was being transformed from an old and fortified city to a modern city. In the early 19th century, Bangkok housing had a certain style:

The ordinary style of building is to erect two small houses in proximity to each other, on the same level. One of these is occupied by the husband and the other by his women. The posts are sunk into the earth three or four feet. The floor is raised six or eight feet from the surface of the ground, and above this the elevation of the room is ten or twelve feet. Thus the houses are all two stories high; but in consequence of the dampness and the spring tides, the lower story is seldom occupied, or even enclosed. Some of these buildings are made of bamboo wicker work, and some of bamboo slats and covered with a species of palm leaf.<sup>151</sup>

By the 1890s, houses thatched with stap leaves declined in favour of houses roofed with tile and zinc.<sup>152</sup>

Row houses were often more convenient for business transactions. They had more capacity to store commodities and space when compared to those of floating houses. Row houses could incorporate modern businesses of offices, import-export distributors, wholesale and retail business and so on. Several European and Chinese businessmen hired row houses to run their businesses such as dispensaries, branch office and printing presses.

Rental rates for row houses were cheap. In 1907, rental rates for a row house at the edge of Bumrung Muang Road and Charoenkrung road ranged between 20 and 100 Baht a month. The rates tended to decline for old wooden row houses, the monthly rate being 3-10 Baht for one room.<sup>153</sup> Between 1900 and 1910, unskilled Chinese coolies labourer earned 0.75-1.0 Baht a day. If they lived together by sharing the same

<sup>151</sup>Bangkok Calendar 1871, p. 134.

<sup>152</sup>N.A.R.5 M. of the Capital 5.5/5 (1901).

<sup>153</sup>N.A.R.5 M. of Finance 9.4 ko/65 (1907).

row houses, rental rates were cheap, and such rents therefore were responsible for attracting people to run their businesses from row houses.

In addition, cheap rental rates also attracted low income groups to live in row houses. Some documents suggest that residents in row houses around the Talard NangLerng were low income groups. In 1901, 613 people lived here of which 252 were Thais and 361 were Chinese.<sup>154</sup> Of this group, 284 persons engaged in trading, 229 persons were general workers, 58 males worked in gambling places and another 58 persons worked as watchmen. Some 60 children stayed in the row houses. Thai occupations included trading in cigarettes, bananas, desserts and sugarcane. Among self-employed occupations were painters, blacksmiths and carpenters. The Chinese traded in tea, cigarettes, rice sugar and rice noodles, or served as general workers in canal digging, road construction and coolie labourers.<sup>155</sup>

There are no reliable data on the rate of return on row house investments before 1932. Cheap rental rates suggest that the PPB did not calculate rent at a point where a maximum profit was obtained. The PPB differed from a general private business firm. The role of the PPB (and the king) was to provide cheap accommodation to the public or to provide welfare to the society. Nonetheless, moderately high returns on investment was a major factor influencing road cutting.

Another major factor responsible for the shift from the water to land was the low rental rates for land. Although roads raised land prices, the rates of land rents asked by various governmental departments were often very low. Land under the management of various ministries was often let without profit on long-term leases of 20-30 years. Between 1912 and 1914, the rental rates for land at Amphur Sampeng which belonged to the Ministry of the Capital was only around 3-10 Baht per square wa annually<sup>156</sup> (Table 3.20). Such cheap rents for long term leases encouraged settlements moving from the waterways to land because the present value of the land use was high relative to rents.

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<sup>154</sup>N.A.R.5 M. of the Capital 8.1/201( 190 ).

<sup>155</sup>N.A.R.5 M. of the Capital 801/201 (1901).

<sup>156</sup>N.A.R6/1. M. of the Capital 15.18/49 (1912-1924).

**Table 3.20** Rentals for Government Land ,1927-1928

District	Duration of contract (year)	Calculated rental rate per square wa per year (Baht)
Pomprab	20	7.02
do	20	16.55
do	20	2.75
do	20	6.68
Prachairchin	20	12.95
do	20	1.03
do	20	1.15
do	10	2.29
do	20	1.54
do	15	6.41
do	20	.50
do	15	2.66
do	20	2.67
LardPrao	20	.13
Bangson	20	.08
Bangsua	20	.37
Bangkhen	20	.13
do	20	.10
do	20	.15

Source: Compiled from N.A.M. of Interior 0601.2.3/52 (1927-1931).

Table 3.20 shows that although rental rates of land received by various governmental departments were much lower than market rates, rental rates in the congested areas such as Pomprab were much higher than areas of sparse population such as Lard Prao, Bangson, Bangsua and Bangkhen.

### **The expansion of trade and investment**

The economic consequences of road building were significant for trade and investment. Business tax collections were greatest from districts where roads were concentrated. Figures of the shop and house tax collections (Phasri Rongran ) in 1911 show that Sampeng generated the highest amount of tax collection followed by Bangrak and Dusit (Table 3.21).

**Table 3.21** Shop and House Taxes (Phasri Rongran) collected by Districts in Bangkok, 1911-1921

Amphur	1911 (Baht)	1919 (Baht)	1920 (Baht)	1921 (Baht)
Sampeng	335,142			
Bangrak	24,246	39,827	45,602	43,331
Dusit	19,956	2,535	3,286	3,322
Sathorn		23,761	24,473	22,898
Samsen		1,078	1,297	1,254
Sumphuntawong		38,521	49,349	49,806
Pahurud		52,460	62,441	42,837
Bangkapi		n. a.	535	971
Chakkrawat		88,149	117,667	109,384
Chanasongkram		13,949	22,280	19,452
Patumwan		8,559	12,250	20,046
Phayathai		250	1,408	1,918
Bangkhunprom		3,635	5,635	5,727
Nang Lerng		8,860	15,034	10,719
Pomprabsatroopai		32,250	32,617	28,383
Chanasongkram		13,949	22,286	19,452
Bangkhen		n. a.	388	398

Sources: Year 1911 is from N.A.R.5 M of the Capital 4.4/7 (1909); and Years 1919-1921 are from N.A.R.6 /1 M of the Capital 11.4/18 ( 1922 ).

Table 3.21 indicates also that in 1921, such shop and house tax collections remained highest around Sampeng district (including Chakkrawat, Sumphuntawong, Pahurud and Pomprabsatroopai). The areas around the Bangrak district including Bangrak, and Sathorn came second. The areas around Dusit district such as Dusit, Nanglerng (also Bangkhen and Bangkapi) contributed less.

The rates of rental on row houses also show the expansion of commerce due to roads. Around 1905 the highest rental rates of general row houses were found at Sampeng district. The rates were 10-15 Baht a month for row houses at the edge of Chakkrawat road. Rental rates were higher (40-45 Baht a month) if their location was established at road corners. A high rental rate also was found at Rajawong road area, where it was 16 Baht a month for a general row houses, and jumped to as much as 60 Baht if the location of the row house was at a road corner.<sup>157</sup> Around BumrungMuang road and Charoenkrung road rental rates were about 12-15 Baht a month for general row houses<sup>158</sup> and about 3-10 Baht a month for old wooden row houses.<sup>159</sup>

<sup>157</sup>Sayomporn, "The Impact", p. 187.

<sup>158</sup>N.A.R.6 Office of Royal Secretariats 21.4/43 (1920).

<sup>159</sup> N.A.R.5 M of Finance 9.4 Ko/65 (1907).

Rental rates for row houses were lower in Dusit District when compared to those of Sampeng, and Bangrak, and many row houses were vacant around the beginning of the century (Table 3.22):

**Table 3.22** Number of Row House Occupancies around Dusit District in 1900

No of Room Available	locations	Number of Room Occupancies
239	(besides Sukhothai Road)	21
133	(besides Dao kang Road)	90
215	(besides Samsen Road)	28
12	(besides Rajawithee Road)	-
17	(besides Daokang Road along the Chaophraya river)	0
Total 616		Total 139

Source: Adapted from Sayomporn Tongasari, "The Impact of Building of Roads in Bangkok During the Reign of King Rama V (1868-1910): A Study in the Area within the City Walls, the Northern and the Southern Parts of the City", M.A. thesis, Silapakorn University 1983, pp. 168-169 based on N.A. Office of Royal Secretariats 195 no 4/87 (1901).

The high rates of vacancies of row houses reflected the slow growth of trade and business in Dusit district, in part because road cutting did not facilitate trade and commerce. Roads such as Rajadamnoen were built with the primary objective to enable the king and royal family to travel and visit people outside the palace. The proclamation of Rama V on the construction of Rajadamnoen road in 1899 claimed:

His Majesty decided that the area between Tumbon Pantom and Tumbon Pom Hak Kamlang Dusakorn was so lonely because of the lack of roads... For the purpose of developing this area he then decided to construct a road from Pra Sumain road across Klong Bang Lampoo at Tumbon Pantom straight to Pom Hak Kamlang Dusakorn; across Klong Padung Krungkasem then to meet Banjamas Road... having its name Rajadamnoen road.<sup>160</sup>

There were also positive relationships between road construction, the value of land transactions, growth of the city and growth of land development. Figures from Table 3.23, show that a large amount of land was bought and sold. For example, in 1910, land transactions in Sampeng and Bangrak were valued at 1,010,298 Baht and 451,802 Baht respectively. Table 3.23 shows the value of land covered by loan and sale contracts in 1910, confirming the importance of Sampeng and Bangrak as the most valued areas for business operation.

<sup>160</sup>Thai Government Gazette, Vol 16, 1899, p 276.



**Table 3.23** The Value of Land Transaction in Bangkok in 1910 ( Baht)

Inner Amphur	Loan Contract	Sold & Bought Contract
Pranakorn	58,446	367,581
Sampeng	52,469	1,010,298
Dusit	31,582	130,070
Bangrak	23,209	451,802
Bangkok Noi	7,340	1,600
Bangkok Yai	1,619	12,400
Banglumpoolang	8,738	-
Outer Amphur	Loan Contract	Sold and Bought Contract
Bankapi	338	-
Bangsua	7,660	1,489
Bangkhen	6,351	-
Bangkhuntien	3,114	1,840
Ratchaburana	-	160,000
Talingchun	360	1,360
Pasricharoen	2,325	3,360
Nongkham	8,260	-

Source: N.A.R5 M.of the Capital 1.4/1 (1906-1910).

Table 3.24 shows land transactions were substantial in 1910-12 in Sampeng, Pranakorn and Bangrak. The high rate of land transactions indicates the intensity of business activity since land was a valuable asset as security title for borrowing money.

**Table 3.24** Land Transaction in Various Purposes Classified by Amphurs ,1910-1912

Amphur	No of Mortgage	No of Bought & Sold
Sampeng	116	202
Pranakorn	79	216
Bangrak	144	190
Dusit	45	106
Bangsua	2	2
Banglumpoolang	2	2
Bankapi	-	7
Bangkok Yai	4	5
Bangkok Noi	84	6
Phasricharoen	1	6
Talingchun	1	7
Bangkhunthien	-	4
Daokanong	-	1
Rajburana	3	-

Source: N.A R.6 M of the Capital 15.2 Ko/1 (1901-1912).

### **The increase of land transportation.**

The construction of roads encouraged land transportation. The development of Bangkok's streets and roads should be considered alongside the introduction of new forms of transport. Roads and such transport together combined to provide the shape of the new city that was emerging from the end of 19th century.

As far as general passenger movement was concerned, the main road-based forms of transportation were the light rail, the tramway (horse and electric), the bus, the rickshaw and the samlor. Of growing significance after 1900 (through for long the prerogative only of the elite) was the automobile. The ubiquitous Bangkok canals and the lack of road communication with the provinces until after 1945 meant that long-distance truck (and bus) communication between Bangkok and the provinces was delayed. The public bus made its appearance on certain Bangkok streets. The pioneer was Lert Setabutra, long remembered as Nai Lert for his active development of motorised bus service. His debut in 1907 was a horse bus, which ran along Charoenkrung in the 1910s and extended to Yosse, Pratunam, and Banglumpoo afterwards.<sup>161</sup>

The first tram in Bangkok was introduced in 1888 by a Danish company operating under a concession from the government. The line began as a horse tramway, but was electrified in the 1890s. Trams required a relatively large capital investment and involved the transfer of western ideas and technology. According to Carter, tram companies had a capital of some 3 million Baht in 1903 and carried around 10 million passengers annually.<sup>162</sup> By 1925, Siam Electric Corporation Co. Ltd, which ran both tramways and power generation, had a registered capital of over 22 million Baht.<sup>163</sup>

In the 1900s, trams served mainly the commercial areas around the river such as Charoenkrung, Sampeng, with extensions to suburbs such as Bangkoalam and Samsen. Major routes in the 1900s included Charoenkrung, Bangkoalam, Samsen, Ausdang, and Rajawong.<sup>164</sup> The length of line then open was 17.3 kilometres.<sup>165</sup>

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<sup>161</sup> Piyanart Boonnarg, **The Development of Land Transportation in the Fifth Reign (1868-1910)**, Bangkok: Chulalongkorn University, 1975, pp. 117-118.

<sup>162</sup> Office of the Prime Minister, Foreign Records, p. 167. based on Carter, The Kingdom of Siam.

<sup>163</sup> N.A. R. 7. M.of Commerce 12/2(1926)

<sup>164</sup> Kuakul Yuanyonganan, **The Development of Land Communications**, Bangkok: Department of Teacher Practice, 1977, p.175.

<sup>165</sup> Office of the Prime Minister, The Foreign Records, p.167 basing on Carter, The Kingdom of Siam.

Trams helped transportation and communication between the commercial districts such and the suburbs. Trams helped settlements extend to more suburbs. Receipts on the route of Charoenkrung, Bangkoalam and Samsen between 1899 and 1907 (Table 3.25) show increasing demand for trams.

**Table 3.25** Revenue earned by the Tramway Bangkoalam and Samsen, 1899 - 1907

Year	Bangkoalam		Samsen	
	Car Miles Run	Receipts (Baht)	Car Miles Run	Receipts (Baht)
1907	900,929	568,036	764,540	322,996
1906	879,324	581,586	630,365	324,870
1905	652,067	531,256	495,175	337,155
1904	536,802	449,321	432,443	315,431
1903	518,976	404,051	433,217	303,013
1902	437,378	305,786	422,609	256,054
1901	361,746	275,268	Started	Started
1900	370,812	247,983	September	September
1899	326,552	190,057		
Increase in previous	7 years	7 years	4 years	4 years
	169%	206%	49%	27%
Increase last Year	2%	2%	21	-1%

Source: Arnold Wright and Oliver T. Breakspear, *Twentieth Century Impressions of Siam*, Bangkok: White Lotus, 1994, p. 191.

From the 1920s trams helped the city move further away from the rivers and canals. In 1925, the Siamese Tramway Co, Ltd built three new lines. One started at the western end of Silom road, near the Bangrak market on the side of the road near the Klong, ran along the whole length of Silom, crossed Klong Hualumpong on a special bridge, and continued along the same side of Rajadamri road up to the foot of Sapan (bridge) Chalerm. A second line branched away from this line at Hua Lumpong, ran along Bumrung Muang, crossed Sapan Yosse, ran along the southern side of Rama I road to cross Klong Rajadamri on a special bridge connecting with the Silom line. Thirdly the Dusit line started in front of H.R.H.Chumporn's palace, ran along the eastern side of Rama V road, and terminated in front of Bangsue railway station.<sup>166</sup>

By 1930, the main routes of trams in Bangkok included Bangkoalam, Samsen, Bangsua, Dusit, Hualumpong, Silom and Patumwan.<sup>167</sup> Tramways helped ribbon development along the main roads outwards from the main commercial areas.

<sup>166</sup>N.A. R.6 M. of the Capital ,13/6(1925)

<sup>167</sup> Tud , *The Geography of Bangkok*, pp. 7-48.

## Conclusion

This chapter has analysed the major patterns of physical change in Bangkok from 1851, concentrating on the expansion of canals and roads and the attendant development of new suburbs. From around 1890 we see clearly a move of Bangkok from a water-based city to a land-based city.

The chapter has brought out the significance of the period from around 1890 to 1911 in Bangkok's development. Key elements here include the rice trade, Chinese immigration, and the activities of the Privy Purse Bureau and groups of foreign investors. Especially, we discussed the important role played by the Privy Purse Bureau in Bangkok's development. We concluded that Bangkok's new streets were often laid out as part of row house construction for royal investment. For much of the 1920s, the physical spread was limited, although at the end of the decade there was a revival of activity.