

High Speed Train in Railway Emerging Country-THAILAND



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The very first railway, a private entity, in Thailand came into existence in 1889. However, it was not until 1895 that the first government railway came into operation and went through a circle of changes to eventually be known as the Royal State Railway of Siam (RSR). In 1951, due to severe damage to the rail system during World War II and the requirements of the World Bank whose loan was sought after to revive the rail system, the railway organization was transformed into a state enterprise known as the State Railway of Thailand (SRT). Arguably, such change has contributed to the stagnation of development of the rail system in Thailand for over 60 years. The lack of sufficient budget has left infrastructure out of date - mostly a deteriorated single track network with poor signaling system and almost every 2 km road level crossing. Share of traffic has declined to approximately 5% for passenger and less than 2% for freight.

With the current population of 67.2 million and a total area of approximately 513,000 sq. km. (198,000 sq. mi.), Thailand is a considerably low density settlement country. The density was much lower when the railway was firstly built with the then population of only 6 million against the bigger size of the country which was gradually shrinking over time during the colonization period to its present dimension. Besides, with its considered naturally agricultural background, the country has never experienced a railway boom as often the case in an industrial country. As a result, instead of infrastructure surplus, SRT has faced with a dilemma of infrastructure scarcity. The current rail network has been stagnant since 1951 at merely over 4,000 km., more than 90% of which is still single-track with only some bottleneck sections in double or triple-track environment.

On the contrary, since 1951, allocation of government budget had been heavily skewed in favour of other transportation modes' infrastructure development - construction of road in particular. As such road has contributed for over 80% of both passenger and freight transport and been far developed to enjoy advantage in term of quantity, quality and accessibility. Undoubtedly, rail has suffered disadvantages in the aforementioned aspects, hence declining role in transportation. After the pass of the State Railway of Thailand Act B.E. 2494 (1951), the operating account shown deficit for the first time in 1974 and has continued running at loss ever since.

For decades, policy makers has focused on prospect of profits and loss of public transport operation while paying less attention to public service obligation and unequal playing ground faced by public operators. SRT has tried, almost to no avail, to raise the point of such unfairness in the rail sector. Throughout its operation as state enterprise, SRT has to bear infrastructure cost as an infrastructure provider in addition to the operational cost typically borne by service provider. While in other sectors,

these roles are clearly separated. The practice has led to a distorted development of public transport infrastructure as a whole. Evidently, road infrastructure development has been of top priority among policy makers and the likes. Worse still was the shelving of SRT investment plan under the 7th National Economic Development Plan 1992-96. Under this plan SRT investment plan was judged on a rolling basis i.e. project by project. The government also directed SRT to acquire an advisory body to explore its business venture. Worse was the discussion on the merit of SRT's existence and contribution to the country as a whole.

Thailand Development Research Institute (TDRI) was employed to study and produce a report. Question similar to those by the committee set up in Japan to solve JNR problem was raised if "Thailand economy prosperity could be brought about without the railway?". The answer to that question led to the report on a long term recovery plan. It was surprisingly the first time that necessity of infrastructure improvement was heard by the policy makers. Yet, it was not until recently that the idea has gained momentum for implementation. Combination of contributing factors such as increasing fuel price, more strategic land use, traffic congestion, environmental concerns, national competitiveness and so forth has urged the public transportation policy makers to shine light on rail infrastructure development. It might be worth mentioning that the rise of BTS sky train in 1999 has helped raising awareness on modern rail transportation in Thailand and has partly been a driving force of modal shift to rail. Needless to say that without the demonstration of how a railway could better a way of living, Thailand may still have continued a vicious circle of expanding road to ease traffic jam hence more traffic jam and expanding road network!

Eventually the shift to rail vision has been realized and the Thai government is now trying to transform Thailand to be more rail-oriented. Worthy of mention is that Thailand's modal shift to rail policy has already been recognized long ago. It was concretely stipulated in Thailand's Constitution 2007 and has also appeared in the statement of the government policy papers ever since. In the "Thai Khemkang (Stronger Thailand Initiative Action Plan of 2012)", the budget up to one-hundred and seventy thousand million baht was allocated, first time ever, for rail infrastructure improvement. Rail development policy has been continuously driven by the following governments, hence more materialized results as seen today. The Ministry of Transport has set forth railway development strategy targeting to increase average speed of freight train from 39 to 60 km per hour and that of passenger train from 60 to 100 km per hour. It also set out vision to increase share of train passengers from 5% to more than 30% for mass transit trains and about 45 million to 75 million person-trips per year for intercity trains. As for freight traffic, the plan is to increase freight share by rail from 1.5% to 40%.

The current regime announced the policy to expedite the construction of Bangkok Mass Transit, the master plan of which has long been approved. By the time the first construction phase of a long distance meter gauge is finished, track length will increase from the present 4,043 to over 7,000 km, of which over 800 km will be double and multiple tracks.



Figure 1: The Investment Plan for Double Track Project Phase I (Meter Gauge)



Figure 2: The Investment Plan of Mass Rapid Transit in Greater Bangkok Region

It is rather clear that modal shift to rail vision is rational and agreeable to all. At least three successive governments have shown positive attitude to propel the implementation with only minor alterations. However, there are still challenges awaiting the government to eventually achieve fruitful return on huge investment on the railway infrastructure and systems. Some of those challenges are:

A) SRT's Roles and Responsibilities

As an operator, SRT would play a key role in turning investment to transport services and revenues. Obviously based on the current situation, it is debatable whether SRT would be able to shoulder such a huge responsibility. Similar to infrastructure improvement, SRT' role and responsibility should also be seriously considered. Should the infrastructure provider role still remain with SRT or transfer to the government like in other modes? Who would take up the regulatory role overseeing the rail industry as a whole? Undoubtedly, the rail sector predicament cannot be solved by SRT alone. A

holistic reform of the rail sector, both government and SRT sides, should be undertaken simultaneously to achieve efficiency and sustainability of rail sector development.

B) Public Private Participation (PPP)

The government has adopted PPP scheme to mass transit projects in Bangkok on assumption that it could save the government budget and enhance operational efficiency. As such, PPP has become the government policy for the future investment of railway projects. However, in terms of macroeconomic and past experience, PPP scheme implies certain fallbacks such as the case of net-cost alternative where a large portion of private capital fund which may result in considerably high fare making the service inaccessible by low income groups, thus jeopardizing the worthiness of public transport system and its related investment. In that respect, the gross-cost alternative where the government takes on operational risk was adopted for the Purple Line project. Generally speaking, PPP is useful in many aspects but implication details should be adjusted to best suit each situation. Ultimately, the criteria for employment of any alternate PPP should lead to maximum accessibility of people and sustainability for operator.

C) Technology and Industry

Thailand has been classified, or ‘trapped’, as ‘middle income’ country for over two decades. Numerous proposals have been made to escape the trap, yet destination and means have not seemed to be ideally aligned. Many countries, on the other hand, have succeeded in elevating per capita income with high technology industries in which railway is one among others like space, air and defense industries. Unfortunately, Thailand has shown little potential to grab the opportunity from the modal shift to rail vision and huge investment as a mean to escape the said middle income trap. Project implementation seems to still adopt traditional bidding process which does not take into account the middle income trap issue nor creating demand for local industries. The fact is that such window of opportunity will open for a short while then the chance will be for gone soon after.

D) Aging Society

The population science stated that Thailand was entering the aging society. The estimation stated that Thailand population would decline to 63.9 million in 2040, of which 20.5 million were elderly, 35.2 million working age and 8.2 million child. Based on the study’s reliability, it would be questionable whether future economic activity would create sufficient transport demand to support all challenging infrastructure investments. Remember that besides the modal shift to rail vision, the term infrastructure improvement also include road projects wherein nationwide motorway network projects are still of high priority.

E) Connectivity and Demand Side Management

The prominent disadvantage of rail transport is “door-to-door” prospective. The success of rail unavoidably involves management of demand side such as integration with other transport modes and origin/destination development to enhance the use of an expensive rail as backbone of transport system. The issues concerning transit-oriented development (TOD), city and land use planning, reform of land use and barrier free to create an attractive walking environment etc. should be included in the process of rail system development. Success of costly rail infrastructure investment could not be made by focusing solely on project implementation.

The Challenges of High Speed Train

It could be dated back to 1992 when the policy makers were searching for a proper solution to SRT problem that high speed train came to light. The first study, backed by NESDB (Office of the National Economics and Social Development Board), was conducted on the eastern corridor -Bangkok to Rayong- where the then Government's MEGA project - Eastern Seaboard Development Program (ESB) was progressing. By that time the newly built electrified train on standard gauge track with speed up to 160 km/hr was envisaged. Construction of high speed train from there on become a topic of discussion in Thailand for many following years. Around 2010, studies have been carried out by the Office of Transport and traffic Policy and Planning (OTP) for every potential lines including Bangkok - Chiang Mai in the North; Bangkok - Nakhon Rachasima/Nong Khai in the Northeast; Bangkok - Rayong in the East; and Bangkok - Hua Hin in the South. Nonetheless, the related studies due to low ridership shown negative return on investment and the successful implementation seem to rest upon the future development of regional land use along the railway which could be futile.

The following governments meanwhile had been trying to find a proper option for project implementation. Then the military government came by May 2014 Coup d'tat, announced in July 2014 to defer the plan until the new elected civilian government is installed.

November 2014, Thailand and China signed a Memorandum of Understanding agreeing to push forward the construction of the Thai portion of the transnational railway running from Kunming, China via Laos PDR to the Gulf of Thailand. Lengthy discussion between the Thai-Chinese working group came to a conclusion in June 2017 when Clause 44 of the transitional provisions of the new constitutional law was applied to empower the prime minister to cut through a dead lock. Decision led to the conclusion that construction of 253 km high speed line between Bangkok and Nakhon Ratchasima be green-lighted. The 179 billion Baht was broken into 2 parts - the first taken up by Thai side includes land acquisition 13 billion Baht and civil work 119 billion Baht while the second part responsible by China includes design Work of 1.8 billion Baht, project supervision 1.6 billion Baht and E&M 38 billion Baht. Submission of design work by the Chinese side is due by the end of 2018 by which the relevant procurement will follow. The optimistic schedule for public service is in 2023 but since the general election is to take place by early 2019, the future of the first ever high speed train in Thailand seem to lie on the ground which the project was formulated and discretion of the new government.



Figure 3: First phase Thai-China High Speed Train Bangkok to Nakhon Ratchasima

Another HSR line which came to light during the time of military government is the so called the 3 Airport Linking Network. The project is an annex of the new initiative program, the EEC (Eastern Economic Corridor), where 2 airports in Bangkok (Don Mueang and Suvarnabhumi international Airport) and U-Tapao in Rayong Province 160 km away to be upgraded to international level and linked together by high speed train. The project worth 224.5 billion Baht includes construction of new

high speed line, modification of the existing air port link, acquisition of railway system and property development. Business structure is intended as PPP Net Cost where government shares investment on infrastructure and private sector shares the other parts and gain the 50 year operation right. Tender documents were sold to 13 bidding contenders to study and prepare proposal for the submission date later in November 2018.

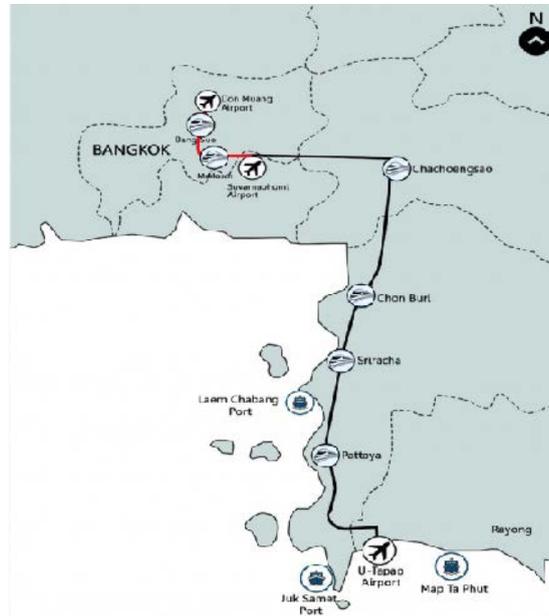


Figure 4: High Speed Train Linking 3 Airports

The last high speed train initiative under the current regime is the Northern HSR: Bangkok - Phitsanulok - Chiang Mai, 750 km long. Following the initial cooperation agreement signed in 2015, the Thai government has sought the interest of the Japanese government to collaborate in the construction and operation of the Northern HSR line. The Japan International Cooperation Agency (JICA) began the revision of feasibility in 2016 prior to its report in 2018 concluded that the train as planned would run at loss. Ridership was predicted at only 10,000 per day which was much lower than the original estimation of 30,000 while profitable ridership from ticket sales would require daily passenger of at least 50,000. Eventually, the Japanese government, instead of sharing risk of 420 billion Baht investment, offered an option of soft loan should the Thai government wish to move the project forward.

Human Settlement in Relation to Shift-to-Rail Vision

I would like to end my paper touching upon the human settlement characteristics in Thailand which to my understanding is vital to the success of shift (passenger) to rail scenario. As mentioned earlier that Thailand population was 6 - 8 million when the railway was built in 1895. When Railway Act was passed in 1951, population was 21 million while the current statistics shows 67 million in 2018. This means the incremental of 46 million over the hibernation period of railway in Thailand. Directed by the then new road construction, human settlement from 1951 up until the present was characterized, by World Bank terminology, as ribbon development - sparse and far flung. When I began study the matter 10 years ago, the urban population was 30% and it has increased to 50% while a lot of people still lives up country engaging in agricultural works. Moreover, based on the way city planning is undertaken and reinforced, city density is also relatively low. Such settlement characteristic is not favorable for rail network development. Mass transit in Bangkok designed as heavy rail still, after 10

years, runs at half capacity while expensive station designed to accommodate 6-car still serves 3-car train. Similarly, airport link station designed for 10-car train currently accommodates 3-car train. It is no wonder that the traffic forecast for every HSR project showed too low ridership. Under the given circumstances, if any of the project was to be implemented, consequences must be understood and risk management shall not be overlooked.

About the Author

Nakorn Chantasorn had 38 years experience working at the State Railway of Thailand (SRT). He is mechanical engineer by education and profession and also an operational research specialist by education. He was appointed Deputy Governor of SRT in 2006 and acting Governor in 2008. He retired in 2010 as SRT's adviser. After his retirement, he has assumed a full time employment as adviser of the President of the National Science and Technology Development Agency (NSTDA), Ministry of Science and Technology, Thailand.

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