ASSESSING HIGH-SPEED RAILWAY PROJECTS: A COMPARISON OF THE NETHERLANDS AND THE UNITED KINGDOM

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1. THE COMPLEXITY OF PLANNING HIGH-SPEED RAILWAYS

Now that the Thai government is evaluating the case for making significant investments in high-speed rail transport, it would be useful to look at the ways in which other countries have dealt with the assessment of their high-speed railway projects. While governments can, and do, embark on projects where budgets are effectively open-ended (e.g., for war, relief work following natural and economic disasters), in practice project appraisal is a very important stage in the planning process for major infrastructure projects. This is because social responsibility and proper accountability to stakeholders and investors depend on proposals for investment in major infrastructure projects such as a high-speed rail system underpinned with a robust business case. Large high-speed rail projects in the Netherlands and the United Kingdom have been subject to rigorous feasibility studies. However, as discussed below, both of these highlight the problems that governments can encounter as they seek to address political constraints while also demonstrating commercial prudence. In the case of the Netherlands, feasibility studies were brushed aside politically in order to move the project ahead. This came at a very high price as the project involved a budget overrun of about 100 percent and nearly bankrupt the main train operating company.

In the case of the United Kingdom, political consensus within Westminster contrasts sharply with the visceral and strident opposition of citizen groups and even business lobbies. While the enabling legislation for Britain's second high-speed rail project slowly grinds forward, a robust and universally convincing business case has yet to be made.

The aim of the present review is to hold up the Dutch and British cases as a mirror for the high-speed rail system being considered for in Thailand by looking into the ways in which the feasibility studies in the Netherlands and the United Kingdom

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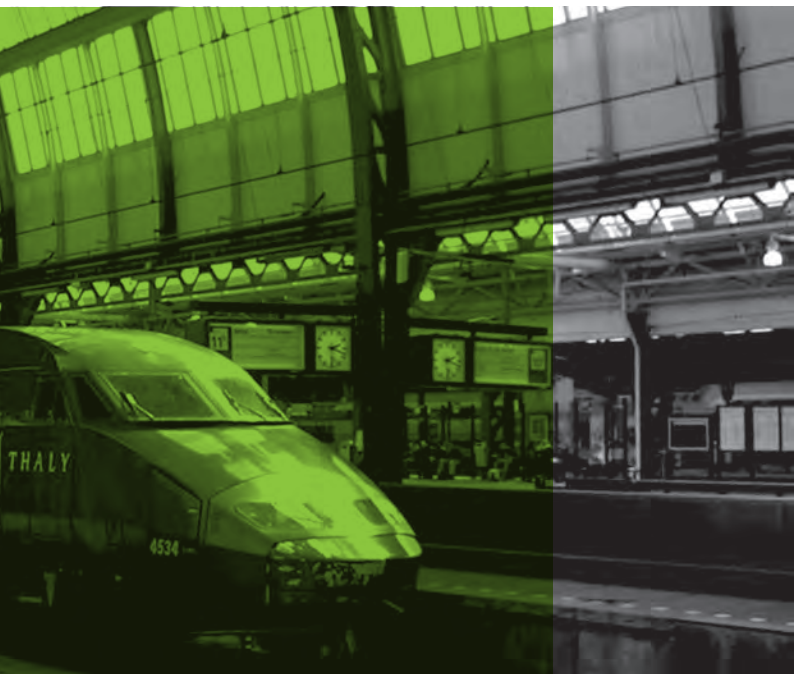


were conducted and the business models that were developed in order to make the projects work.

2. THE QUESTIONABLE FEASIBILITY OF THE NETHERLANDS PROJECT

The roots of the Netherlands project can be traced back to the late 1970s, when the governments of France, Belgium, Germany and the Netherlands agreed to connect Paris (France), Cologne (Germany), Brussels (Belgium) and Amsterdam (Netherlands) to the emerging European network of high-speed railways. The Netherlands project called for two main corridors: one running from Amsterdam to the east, past Utrecht and onward to Cologne, and the other running from Amsterdam in a southerly direction to Rotterdam and Brussels. In addition, a minor branch would serve the northern provinces. Of those three routes, the only one that made it through the project appraisal process was the southern connection, which was appropriately named Hoge-SnelheidsLijn-Zuid (HSL-Zuid; High-Speed Railway-South); it opened in 2010. This line turned out to be impossible to run profitably. Ultimately, the operator, NS HiSpeed, had to be saved from bankruptcy three times. Clearly, appraisal of the project had been wide of the mark. So what happened?

The formal planning procedure started in 1987 and encompassed three major studies: the formal feasibility study, the route decision, and the environmental impact assessment of all variants. There were multiple alternatives for track alignment but from the onset it was clear that the Minister for Transport strongly favored a newly built track over the upgrading of existing tracks. In addition, the new track was to be as short as possible and offer a maximum speed of 300 km/hr. These preferences had a defining impact on the scope of the feasibility studies and the whole project (Gerrits and Marks, 2014).

When the proposal was sent to the Parliament for approval in 1991, it met severe criticism from both its members and the media. First, the costs were estimated to be fl. 3.2 billion (the exchange rate was then equivalent to 1 Dutch guilder = approximately 18.18 baht), of which only fl. 1.5 billion could actually be covered under the national budget. Second, it was widely believed that the budget estimate was too low and that costs of fl. 5 billion would be more realistic. Third, the

Minister stated that 50 percent of the construction costs would be paid for by the private sector in a public-private partnership, but the private sector showed no interest at all in the project. Fourth, the choice of new over existing track was considered to have been poorly conceived, especially given the marginal shorter travel times in comparison to alternatives. Fifth, lack of agreement with Belgium about alignment across the border meant that the plan was not as robust as had been presented. Given these considerations, it is no surprise that the whole proposal was rejected and that the government returned to the drawing boards.

Development of the second version of the plan took place between 1992 and 1996; a total of 23 research reports were produced during this time. When the plans were presented, it turned out that the government kept favoring new tracks over upgrades of existing ones. In fact, it pushed the so-called A1 route from Amsterdam to the border with Belgium. A1 was indeed the shortest possible route offering the highest average speed, but it was also the most expensive one because of the costs of land acquisition and the construction of a considerable numbers of tunnels and viaducts. In order to avoid another rejection, the government engaged in extensive consultation with stakeholders. It soon became clear that there was mixed political support from political parties and local governments for the A1 route, especially because it runs through a protected nature reserve. In response to the opponents, the government proposed to build that particular section inside a 7 km tunnel. Although this meant an increase in political support, it also added fl. 900 million to the projected budget. Additional measures such as elevation of tracks and grade separation added to both political support and increased costs (Algemene Rekenkamer, 2007).

Subsequently, the feasibility studies became more realistic but the prospect of having a sound financial, economic and social basis was still a distant prospect. The net present value of a full high-speed railway was estimated at about fl. 2.1 billion, while other options perform somewhat better: fl.1.3 billion if a partially new track would be used, and fl. 0.4 billion for an upgrade of the existing routes. The cost-benefit ratios were estimated at 0.97 for the project itself (it had been 1.47 in the previous version of the feasibility study) and 1.45 for the wider economic impact (it had been 1.75 in the previous version). Some changes were made in the prognoses, but only to the most optimistic scenario, and more negative scenarios were taken out of the policy proposal. It should be noted that there were no valid and calibrated reference scenarios for calculating direct revenues and the expected number of passengers.

When the project was proposed to Parliament, there was just enough support to have it passed. In hindsight, it is clear that this outcome first and foremost reflected the outcomes of a political game that was played out in Parliament, where the government threatened to resign if the project was not approved. In other words, while a decision to build was made, the foundations of that decision were not very firm; in fact, they were questionable.

As for the construction phase, it turned out that the private sector had no interest in a public-private partnership for financing, building and maintaining the infrastructure, as had been predicted. Ultimately, the government decided to build the track foundations, tunnels, bridges and overpasses using classic design-and-construct contracts. By bearing the risks of, for example unstable ground conditions, the government could persuade the private sector to build the tracks, catenary and signaling system through a design-build-finance-maintain-operate contract, granted to a consortium called Infraspeed. The construction was plagued by setbacks and issues with the underdeveloped technology of the new European train control system. At € 11.8 billion (€ 1 = 44.37 baht), the construction ended up being twice as expensive as had been forecast in the most recent estimate.

The operation of the railway was separated from the construction phase. The Minister decided to put it out to tender, which was a first in the history of Dutch railways. This move was motivated

by a general assumption that the trains could be run profitably, which would help the government to recoup some of the enormous capital investment. The value for the concession was estimated at about € 100 million annually. Private companies thought that the price was too steep, a sentiment shared by Netherlands Railway (NS), the semi-independent state railway company of the Netherlands. Parliament pressured the Minister to grant NS the first opportunity to hand in its offer. The offer made by NS was considered too low so the tendering process went ahead. This time NS, fearing a defeat by competing train operators, made the highest offer, capped at € 148 million annually. The poor foundations of the project appraisal became apparent during the actual operations; it turned out that the number of passengers willing to pay a surcharge for the service was 10 times lower than had been projected. The burden of the very expensive concession, the lack of passengers and technical failures of the (cheap) trains meant that the operation folded in early 2013 (Gerrits and Marks, 2014). At the time of writing, the government is working on an alternative approach, which means the introduction of a different business model and, above all, taking a big financial hit as the concession collapsed and the project turned out to be much more expensive than had been estimated.

3. THE INCONCLUSIVE FEASIBILITY OF THE BRITISH HS2

In March 2010, the Labour Government of the United Kingdom announced a plan to build a new high-speed rail system. The new system, known as HS2, would cost £ 32 billion (£ 1 = 54.82 baht) and would be constructed in two phases. The first phase, due to begin operations in 2017, would link London to Birmingham, and would be operational by 2025. Birmingham is the country's second-largest city by population and lies in the middle of England, 190 kms from London. This would be followed by further connections from

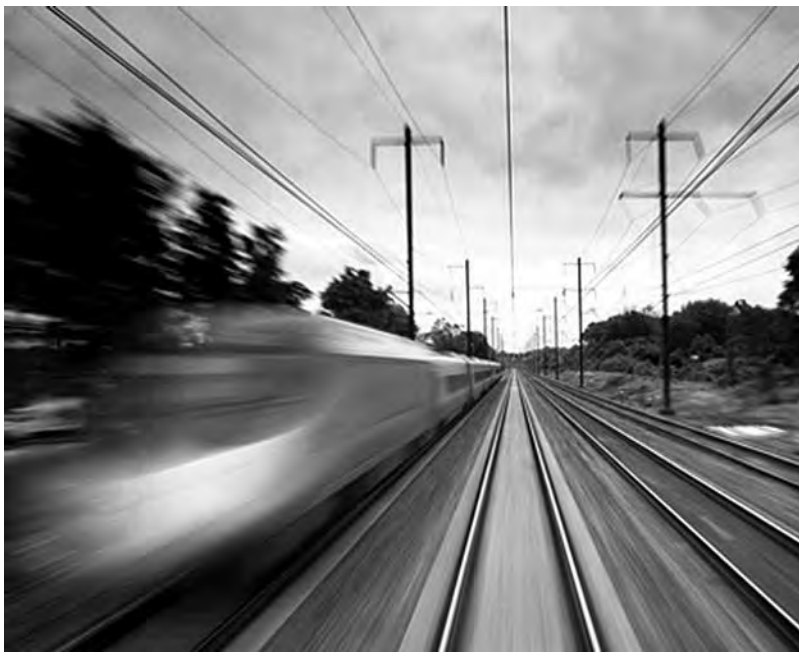
Birmingham to Manchester (320 kms from London) and Leeds (313 kms from London). The whole system is planned to be operational by 2032. The plans by HS2 Limited state that trains traveling at up to 400 km/hr 18 times an hour, carrying up to 1,100 people on each trips, are expected to greatly increase passenger capacity while almost halving journey times between all of these places.

As Campos and de Rus (2009) has argued, high-speed rail (HSR) is about "more than speed." Instead, what matters is the relationship of HSR with existing conventional services and the way in which the use of infrastructure is organized. Four basic operational models for HSR have been outlined:

1. The exclusive exploitation mode: a complete separation between high-speed and conventional rail services, each one with its own infrastructure. This is the model adopted by the Japanese Shinkansen opened in 1964 (Smith, 2007) and is also very close to the one proposed for HS2.
2. The mixed high-speed model: high-speed trains run either on specifically built new

lines, or on upgraded segments of conventional lines. This is the French model of HSR whose TGV (Train à Grande Vitesse) has been operating since 1981.

3. The mixed conventional model: some conventional trains run on high-speed lines. This model has been adopted by Spain's Alta Velocidad Española (AVE).
4. The fully mixed model allows for the maximum flexibility, since this is a case where both high-speed and conventional services can run (at their corresponding speeds) on each type of infrastructure. This is the model reflected in the German intercity trains where high-speed trains occasionally use upgraded conventional lines, and freight services use the spare capacity of high-speed lines during the night.



The timing of the 2010 HS2 announcement reflected the fact that just two years after the global financial crisis, the Labour Government was facing a general election and needed a big idea to excite the electorate (Darling, 2011). A new HSR system seemed to offer the promise of rebalancing the national economy, which meant redistributing the growing wealth of London to the struggling post-industrial regions in the midlands and region north of England. However, as discussed below, professional bodies and academics have challenged the rationale for HS2 in three key areas: the scale of state investment; the risk of cost overrun; and the viability business case, or the extent to which HSR could meet social and regional objectives.

Further, HS2 seemed to offer an innovative solution to the growing passenger congestion on English rail networks (Eddington, 2006) as well as a potent means of attracting passengers away from using cars and airplanes, thus implying a reduction in the emissions of carbon dioxide. The announcement of HS2 surprised many, especially as the Labour Government had recently accepted the Eddington report which argued that, because Britain's urban centers were relatively close to one another, existing rail services could provide adequate services. Moreover, Eddington cautioned against concentrating scarce investment resources in large-scale transport schemes.

Subsequently, the Labour Party lost the general election. The United Kingdom was now governed by a coalition of the Conservative and Liberal parties. Almost immediately, however, the new government adopted the HS2 policy. Three reasons underpin this apparent spontaneous political consensus. First, a public conversation about fast trains was already under way in the United Kingdom. The Intercity 125 service (i.e., up to 201 km/h) had been introduced in 1976. Furthermore, both the Liberal and Conservative parties had begun to talk about the virtues of HSR even before Labour's 2010 announcement. Second, the United Kingdom is a signatory to the European Union's Leipzig Agreement, which is aimed at creating a Europe-wide HSR network (Cattan, 2007).

Third, the HSR idea had a number of champions in government and the general economy; they used their influence to keep the HS2 concept alive, and this championing or "thought leadership" continues to be crucial in sustaining the HS2 idea

(Jenkins, 2014). Moreover, by 2010, as many as 20 countries had embraced the HSR concept (Abbalate, 2014), reflecting perhaps an emerging trend for economic policy in general to be increasingly driven by cross-border harmonization and supra-regional dynamics rather than national governments alone (for example, see Jayasuriya, 2005).

Soon after the 2010 announcement, a well-organized community-based campaign against HS2 was launched. Those opposed to HS2 argued that the scheme is an immediate threat to their homes and overall quality of life. Railways designed to carry 300 km/h trains cannot change course to avoid cherished local environments and buildings. The government subsequently sought to nullify community objections with agreements to create tunnels beneath sensitive areas but this drove HS2 budget forecasts to £ 50 billion. Furthermore, in the eyes of the protesters only those living near the relatively few stopping points of HS2 (nine points, including London) stand to benefit from the project. Yet, increasing the number of stops would be difficult as a high-speed train's efficient running requires infrequent stops.

In particular, there is skepticism that HS2 can reverse the flow of the nation's talent from the regions concerned to London. Studies of the impacts of HSR on regional economic growth in France have suggested that enhanced proximity between places can result in the major regional center growing at the expense of the weaker one (Vickerman, 2007). Yet, governments are increasingly aware that the challenge of job-creating innovation takes place in international networks reaching far beyond their region's boundaries (Benneworth and Dassen, 2011). Thus, overruling objectors and insisting that an unpopular proposal for high-speed rail go ahead could be construed as an act of visionary governance striving for long-term job creation through enhanced interregional connectivity.

However, the plausibility of the business case for HS2 continues to test the loyalty of even the project's most ardent supporters. On one hand, the United Kingdom has experienced severe budget overruns in HSR projects; the country's first HSR service, HS1, between the United Kingdom and France, came in 80 percent over budget for construction and 140 percent over budget for financing. On the other hand, the HS2 proposals have struggled to meet the minimum benefit-cost ratios (BCR), the test of viability applied to all government projects. So far the government has made five attempts to publish a business case which conforms with Treasury guidelines and has managed to silence the critics of the HS2 plan. Controversially, the target BCR has been met only by consistently widening the variables on which HS2 has been assessed and lengthening the time taken to reach the target figure. From the outset, the projections of demand and ticket revenue were driven by an assumption of sustained national economic growth. As optimism about renewed growth following the 2008 financial crisis has persistently waned, the already disputed plausibility of the HS2 business case has weakened. The practical consequence of all of this is that the BCR has been relentlessly falling. Earlier editions of the business case had suggested that HS2 would return £2.50 for every £1 (i.e., a BCR of 2.5) invested in the overall project. Impor-

tantly, the most recent update of the government's case for HS2 now anticipates a BCR outturn of 2.3 (Department of Transport, 2013). In mitigation, the government has pointed out that the HS2 BCR is still higher than that forecast for the Jubilee Line, the London Underground line completed in 1979. Furthermore, the Jubilee line has now become the main transport corridor into Canary Wharf, London's major financial district, as well as connecting central London with the zone that had been created for the 2013 Olympics.

4. REFLECTION ON THE THAI PROPOSALS

The creation of high-speed railways has been widely discussed in Thailand since January 2013 following the Thai government's proposal to launch a new infrastructure investment regime in the form of the transport infrastructure investment loan bill, which is usually refered to as the "2 Trillion Baht Loan Bill." This bill includes investment in four HSR lines.

In this section, we describe the transport infrastructure investment bill and the feasibility studies of HSR in Thailand in the past. Then, we report on the current development of the transport infrastructure investment bill and the possibility of the HSR in Thailand in the future.

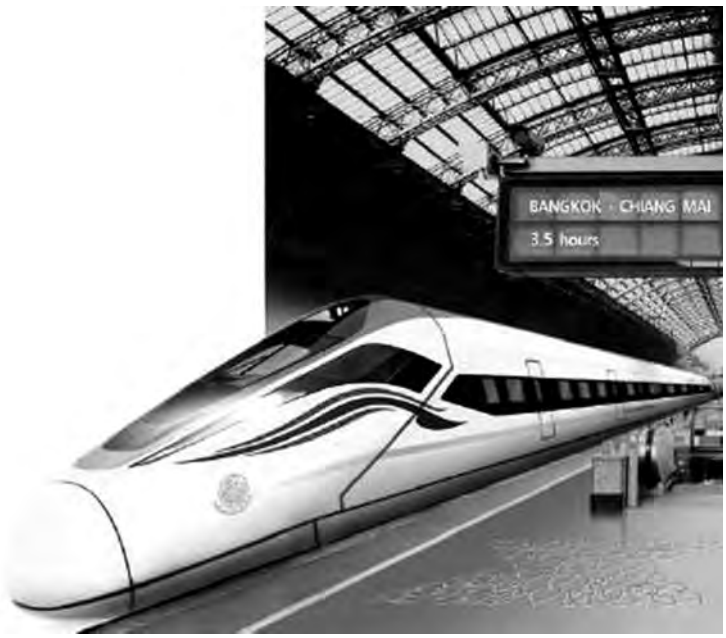
In January 2013, the Thai government anounced its plan for making a major investment in transport infrastructure, in the form of the transport infrastructure investment loan bill. This bill dedicated the budget mostly to railway infrastructure investment. The rational of this bill is that the current budgeting scheme does not allow the government to secure long-term investment funds for railway development due to the constraints imposed by the annual budget rules. The bill consists of a plan for transport infrastructure investment projects that cover four major groups: the first group comprises HSR projects accounting for roughly 40 percent of the total budget; the second group involves upgrading the existing railway projects and accounts for roughly 20 percent of the total budget; the third group involves the metro system in Bangkok and vicinity at roughly 20 percent of the total budget; and the fourth group involves road construction projects and other transport facilitation projects at roughly 20 percent of the total budget.

However, one critical point concerning this bill is that for about half of the proposed projects no feasibility studies have been conducted. Somchai and Sumet (2013) categorized projects in the bill into four groups as follows:

(a) Projects which do not need feasibility studies, which are worth about 56 billion baht;
(b) Projects for which feasibility studies have been completed, which are worth about 473 billion baht;
(c) Projects for which environmental impact assessments (EIA) have not been completed, which are worth about 529 billion baht; and
(d) Projects that have yet to conclude or to start feasibility studies, which are worth about 932 billion baht.

HSR projects are in the fourth group, i.e., the feasibility studies have not yet been concluded or started. Although there were several feasibility studies on HSR in the past, the details of each study are not complete to the degree that would enable decision-makers to decide to invest in the projects. Furthermore, both Japan and China expressed interest in bringing their HSR-technology to Thailand. In 2012, both of those countries, through their subsidiaries, prepared pre-feasibility study reports on HSR and submitted these to the Ministry of Transport. Although the reports are not publicly available to review, the results of these reports suggested that HSR is feasible only with substantial subsidy from the government, at least for the infrastructure costs.

In fact, the key document that is publicly available is the Thailand Master Plan for Development of Double Track Rail and High-Speed Rail (Office of Transport and Traffic Policy and Plan-



ning, 2010). This report furnishes a sort of pre-feasibility study of the HSR lines, and also comes to a vague conclusion on whether to invest in the HSR projects.

The crucial aspect that the government failed to mention is the situation of normal railway development in Thailand. Currently, railways are operated by the State Railway of Thailand (SRT), which is the state-owned enterprise that holds a monopoly to operate the country's railways. In terms of railway infrastructure, SRT operates a network of 4,180 km of rail tracks that have seen little development in the past three decades. Most are single, narrow-gauge (1 meter) tracks that account for 3,901 km or 93.3 percent of the total railways, while double and triple tracks constitute only 220 km (5.3%) and 59 km (1.4%), respectively, of the total. The tracks can carry loads of 15-18 tons. As such, much could be gained from upgrading the existing network instead of going for full (and expensive) HSR.

HSR is one of the central issues that have been publicly debated in Parliament; the previously mentioned bill was finally put through in November 2013. However, the opposition party that filed a case against it with the Constitutional Court argued that this bill violated the Constitution on two counts: first, the government allowed its Members of Parliament to vote on behalf of absent colleagues; second, the government chose, under this bill, to finance the infrastructure projects with off-budget loans that would not be scrutinized by Parliament. In March 2014, the Constitutional Court ruled that this bill was unconstitutional on both counts.

5. CONCLUSIONS

We have looked at three attempts to develop HSR in three different countries. There are some remarkable similarities here. First of all, it seems that HSR becomes a goal in itself instead of a means to achieve something. The most prominent sign of this is the tendency to overlook or even ignore the fact that upgrades to the existing normal rail network could already meet most of the goals of HSR without incurring the enormous costs associated with such systems. This is testimony to the fact that the project appraisals are partially blinded by the optimism stemming from the often unsubstantiated claims that HSR produces many benefits. As such, it is fair to say that project appraisals are often shaky and skewed toward politically desired outcomes. For instance, the Netherlands case showed that the project went ahead even after the appraisals were rejected; as we now know, there were good reasons to question the supposedly optimistic outcomes. Knowing this, the Thai project should be approached with caution. Even more to the point is the ample evidence that most large infrastructure projects are structurally over budget and out of time. In the words of Flyvbjerg et al. (2005):

> "In the grip of the planning fallacy, planners and project promoters make decisions based on delusional optimism rather than on a rational weighting of gains, losses, and probabilities. They overestimate benefits and underestimate costs. They involuntarily spin scenarios of success and overlook the potential for mistakes and miscalculations.

As a result, planners and promoters pursue initiatives that are unlikely to come in on budget or on time, or to ever deliver the expected returns."

One should not forget the above warning; prestigious HSR projects should be avoided as they are likely to become bottomless money pits, especially if credible railway alternatives are available at lower costs.

This comparison offers an important lesson for Thailand. SRT has financial problems, i.e., it has debts of about 120 billion baht. In the past, SRT's performance with regard to passenger and freight transport has been declining, and its debts increasing. To increase Thailand's international competitiveness, rail transport is an essential mode in the logistics system to reduce overall logistics cost. In a study on railway reform (TDRI, 2009), it was proposed that a railway reform process be initiated in which the restructuring of SRT would be an important element. Because of SRT's problems, it is not clear that SRT would be the agency that implements HSR projects. However, it is essential to acknowledge that the normal railway will be an important element in supplementing HSR lines in the future, and SRT needs to undergo a transformation to make this possible.

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