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**Working Paper**

## Relationship between high-speed rail and regional development: Lessons from Japanese benchmark cases

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**ADB Working Paper Series**

**RELATIONSHIP BETWEEN HIGH-SPEED  
RAIL AND REGIONAL DEVELOPMENT:  
LESSONS FROM JAPANESE  
BENCHMARK CASES**

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**Abstract**

High-speed rail (HSR) is not a “sufficient condition” but a “necessary condition” for regional development. Understanding how to use HSR for regional development is essential. Japan’s Shinkansen (bullet train) has a 50-year history, and Japan has long attempted to utilize Shinkansen for regional development. In this paper, I will introduce Shinkansen-related regional development cases, including a national economic plan, tourism promotion, and development around Shinkansen stations.

There are currently several HSR development plans in process around the world, especially in Asian countries. The Japanese experiences presented in this paper are informative and useful for these countries. I will introduce a case study concerning advising Kuala Lumpur–Singapore’s HSR based on Japanese experiences, in particular the effectiveness of the “back-casting approach” for localization.

**Keywords:** high-speed rail, regional development, Japan shinkansen

**JEL Classification:** L92, N95, O53, R58

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## 1. INTRODUCTION

With respect to the relationship between high-speed rail (HSR) and regional development, we ask “Does HSR contribute to regional development?” The answer is, of course, “Yes.” HSR contributes to regional development. The larger question is “How does it contribute to regional development?”

My conclusion is that HSR is not just a sufficient condition, but a necessary condition, for regional development. This means that the construction of an HSR is not the ultimate goal, it is just a milestone. The ultimate goal is using HSR for regional development.

I will introduce a good Japanese example; the Joetsu Shinkansen and Sado Island tourism promotion project.

## 2. JOETSU SHINKANSEN AND SADO ISLAND TOURISM

The Joetsu Shinkansen and Sado Island tourism represent a typical example of the relationship between HSR and regional development.

Sado Island is located in the Niigata prefecture and in the Sea of Japan. The distance between Sado Island and Niigata city is around 45km. High-speed vessel (jetfoil ferry) permits travel from Sado to Niigata in one hour.

Joetsu Shinkansen, which connects Omiya and Niigata, began operating in 1982. The Shinkansen and high-speed vessel connected Tokyo travelers to Sado Island within four hours. People believed that the number of tourists to Sado Island increased dramatically thanks to Joetsu Shinkansen.

Figure 1 shows a time series of the number of tourists to Sado Island. In this figure, we can see three attention periods.

The first period to note is 1982. Joetsu Shinkansen began operating in this year, but the number of tourists did not increase in spite of its presence. This shows that the start of Shinkansen was not sufficient for regional development.

The second period to note spans 1989–1990. In 1989 and 1990, the number of tourists increased dramatically, due to Shinkansen-related measures, such as a package tourism tour called the “Sado Winter Plan,” which was an overnight travel tour including nice hotels and excellent fish cuisine limited to the winter season. This package tour was created by four key players: the East Japan Railway Company (JR East), which operates Joetsu Shinkansen; Sado Kisen, which operates the car ferry and jetfoil ferry services to Sado Island; Niigata Kotsu, which operates the tourist bus on Sado Island; and the Sado hotel association. This package tour raised tourism to Sado Island over 20% during the 1989–1990 winter season.

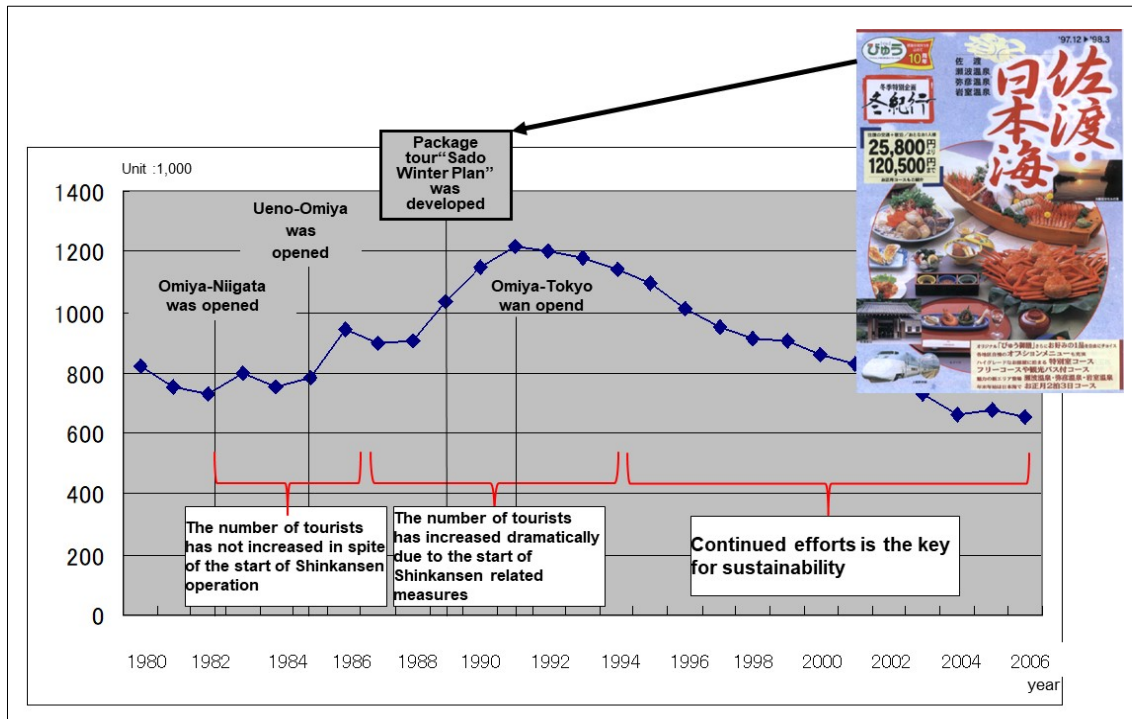
Summer is the traditional tourism season on Sado Island; fewer tourists visit Sado Island in the winter. The previously mentioned key players desired to activate tourism in the winter season. Toward realizing their common purpose, they created the high quality, but reasonably priced package tour for winter.

The package was a two-day trip, which length is standard for an overnight tour in Japan. Thanks to Joetsu Shinkansen, the large tourist market of the Tokyo metropolitan area fell within the two-day trip area to Sado Island.

The third time period of interest occurs after 1990, when the number of tourists began to gradually decrease. The four key players created their promotional package tour

in 1989, and subsequently encountered unremarkable tourism development on Sado Island. As other areas had been developing similar package tours and attracting tourists from Tokyo’s metropolitan area, the number of tourists to Sado Island decreased. This result shows that continued efforts are needed for sustainable growth.

**Figure 1: Number of Tourists to Sado Island**



Source: Kazuaki Hiraishi: Shinkansen and Regional Development.

### 3. LESSONS FROM JAPANESE BENCHMARK CASES

Japan’s development of the Shinkansen network began in 1964, when Tokaido Shinkansen started its operation. In the process of Shinkansen development, many regional development projects along the route have been executed. Some of these projects were successful, and some of them failed. These experiences are valuable not only for Japan, but for emerging and developing countries that are planning to introduce HSR.

From the view point of exporting Japanese infrastructure, it is meaningful to convey to emerging and developing countries the know-how of HSR-related regional development, as well as HSR technology itself. Japan has been trying to share its experiences with HSR-related regional development to partner countries. A typical example is the Kuala Lumpur–Singapore HSR.

The HSR between Kuala Lumpur and Singapore was planned to start its operation in 2026. Due to the regime change in Malaysia, the HSR project is currently halted. Whether or not the project restarts depends on the decision of the Malaysian government. In the event that this HSR development resumes, it will be essential for Malaysia and Singapore to make good use of HSR for regional development.

For this purpose, we carried out a benchmark study for the Kuala Lumpur–Singapore HSR. The “back-casting approach” is effective for conveying Japan’s experiences. We commenced the study according to the following three steps.

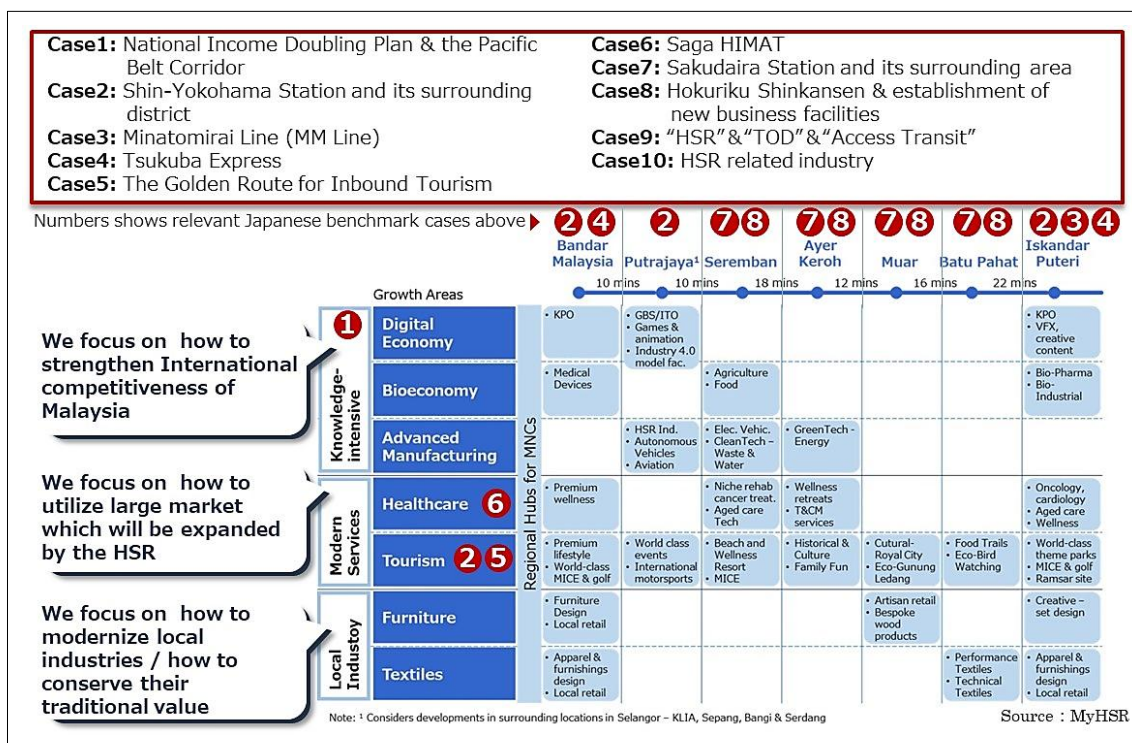
First, we set a goal of creating regional development along the HSR from based on the “Strategic Development Framework” designed by Malaysia.

Second, we selected some Japanese benchmark cases that provide useful information to Malaysia. In this study, we chose the following 10 cases.

- ✓ Case 1: National Income Doubling Plan and the Pacific Belt Corridor
- ✓ Case 2: Shin-Yokohama Station and its surrounding district
- ✓ Case 3: Minatomirai Line (MM Line)
- ✓ Case 4: Tsukuba Express
- ✓ Case 5: The Golden Route for Inbound Tourism
- ✓ Case 6: Saga HIMAT (Heavy Ion Medical Accelerator in Tosu)
- ✓ Case 7: Sakudaira Station and its surrounding district
- ✓ Case 8: Hokuriku Shinkansen and establishment of new business facilities
- ✓ Case 9: “HSR” & “TOD” & “Access Transit”
- ✓ Case 10: HSR-related industry

Third, based on the goal and the Japanese cases, we offered some suggestions on how to proceed with regional development in Malaysia.

**Figure 2: Growth Areas in SDF and Japanese Benchmark Cases**



Source: MLIT: Study on Regional Economic Impact by Introducing High Speed Rail in Overseas.



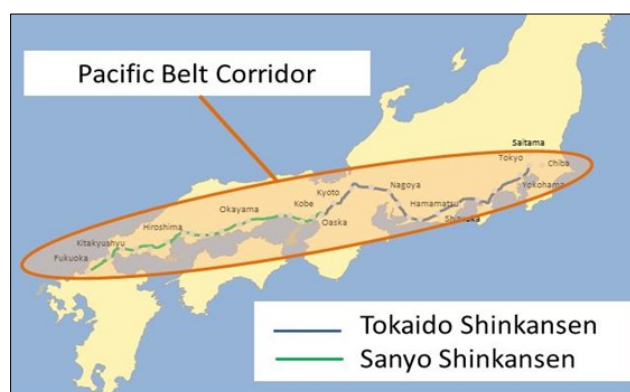
I will introduce, from the 10 cases listed previously, the following three cases and their implications for Malaysia.

### 3.1 National Income Doubling Plan and the Pacific Belt Corridor

The first case is the “National Income Doubling Plan and the Pacific Belt Corridor.” This plan was the most successful among Japanese national economic plans. In this plan, the economic corridor called “the Pacific Belt Corridor” was proposed. It was a driving force for the Japanese economy during the period of high economic growth in the 1960s.

Tokaido and Sanyo Shinkansens, and some expressways were essential infrastructure of the Corridor. Since investments are concentrated in the areas along the Pacific Belt Corridor, Japanese international competitiveness has been enhanced. Large investments were made in the heavy and chemical industries, which were the driving industries of the 1960s in Japan.

**Figure 3: The Pacific Belt Corridor**



One of the typical measures was “the Special Area for Industrial Consolidation” (SAIC). SAIC were new, middle-class industrial areas along the Pacific Belt Corridor concentrating on heavy and chemical industries.

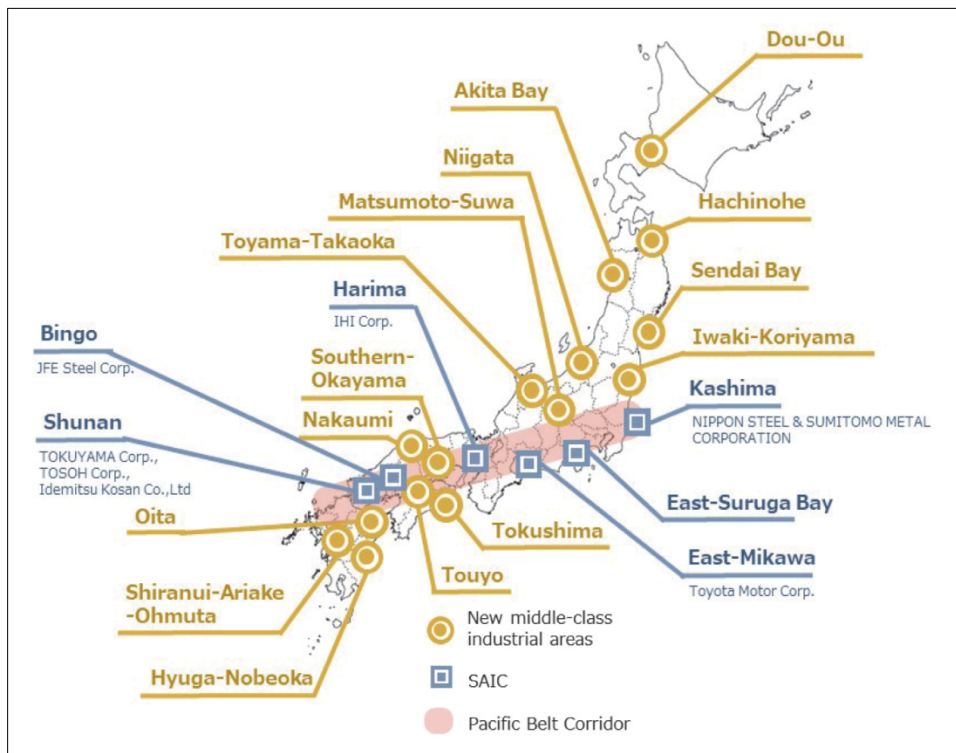
At that time, four major industrial areas (Keihin, Chukyo, Hanshin, and Kitakyushu) had been already saturated. To further industrial development, Japan allocated a large amount of investment to these special areas located on the Pacific Belt Corridor.

Based on the SAIC experience, we counseled Malaysia on the following recommendations:

- ✓ Attach a high value to the Kuala Lumpur–Singapore HSR in the national economic plan. Malaysia had already made a “Strategic Development Framework” in which a goal of regional development along the HSR was set.
- ✓ Formulate an industrial corridor along the Kuala Lumpur–Singapore HSR to enhance Malaysia’s international competitiveness, and concentrate various measures to certain special development areas along the Corridor.

- ✓ Place importance on promoting private investment. For example:
  - Prepare a master plan for special development area;
  - Develop infrastructures such as industrial parks, industrial water supplies, roads, rails, ports, etc.;
  - Seek financial backing from local governments in charge of infrastructure development;
  - Encourage tax reduction for enterprises.

**Figure 4: The Special Area for Industrial Consolidation**



Source: MLIT: Study on Regional Economic Impact by introducing High Speed Rail in Overseas.

**Figure 5: Implications for Malaysia**

Japan		Malaysia
National Income Doubling Plan	Plan	National Physical Plan(NPP)+SDF
Pacific Belt Corridor	Corridor	KL-Singapore Economic Corridor
Heavy & chemical industry	Driving Industry	Knowledge Intensive Industry
Tokaido & Sanyo Shinkansen	Infrastructure	KL-Singapore HSR

Source: MLIT: Study on Regional Economic Impact by introducing High Speed Rail in Overseas.

### 3.2 Shin-Yokohama Station and its Surrounding District

Shin-Yokohama station is 5 km away from the Central Business District (CBD) of Yokohama City. It is a newly developed Shinkansen station. In this case, transit-oriented development (TOD) is essential.

The most important role of local government is to make a master plan as the first step for TOD. Yokohama City designated the Shin-Yokohama district as the sub-core of the city in their master plan.

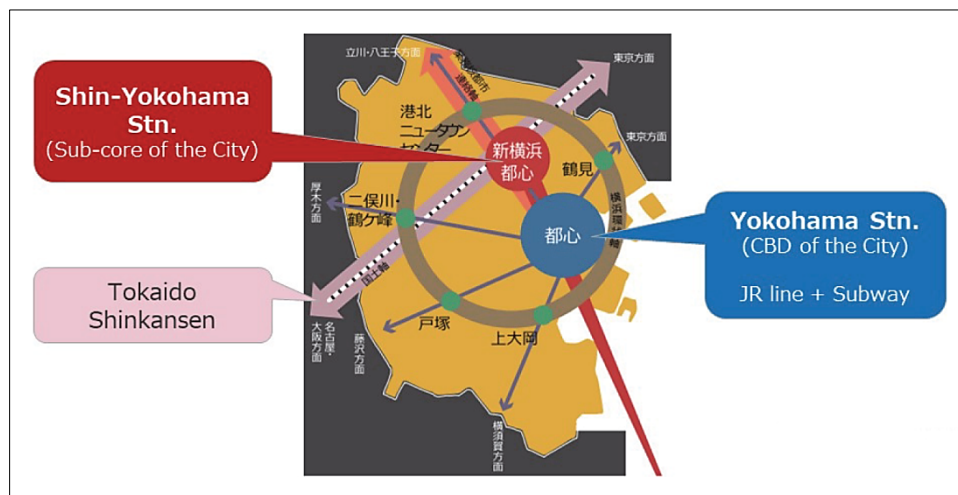
Yokohama City also developed access transit to the CBD. In addition to the JR conventional railway, a subway line was newly constructed to connect between Shin-Yokohama and the CBD.

Then, Yokohama City conducted urban development around Shin-Yokohama station. Nissan Stadium and Yokohama Arena are typical facilities. Nissan Stadium is a soccer-specific stadium used for international games such as World Cup soccer. Yokohama Arena is a concert hall where international music events are held frequently.

These attractive facilities contribute not only promote TOD, but increase the number of Shinkansen passengers. As these facilities were developed, more people came to visit the Shin-Yokohama area and the number of passengers using Shin-Yokohama station increased. As the number of passengers increased, the railway operating company (JR Tokai) revised the train time table to increase the number of trains stopping at Shin-Yokohama station. Previously, the higher-category train, “Nozomi,” had not stopped at Shin-Yokohama station. But now, all of the higher-category trains stop at Shin-Yokohama station.

As the area around the station developed, more people visited and the number of passengers has been increasing. As a result, the time table was improved, which led to a further increase in passengers.

**Figure 6: Shin-Yokohama District and the Master Plan of Yokohama City**



Source: Yokohama City (revised by Mitsubishi Research Institute).

Based on the above Japanese experience, we counseled Malaysia on the following recommendations:

- ✓ Local government should take initiative in the process of master plan formulation for the area surrounding the HSR station.
- ✓ Formulation of a master plan is the first step for TOD. It is recommended that the master plan be shared among the related stakeholders.
- ✓ It is a good idea to include attractive facilities in the plan. Attractive facilities contribute not only to the promotion of TOD, but increase the number of HSR passengers.
- ✓ It is beneficial for local government to construct and operate an access transit between the HSR station and CBD.

### 3.3 The Golden Route for Inbound Tourism

Starting an HSR operation is a good opportunity for promoting tourism. Of course, HSR itself becomes an important transport means for inbound tourists. Moreover, cooperation among multiple international airports, the HSR, and tourism sites along the HSR attracts more inbound tourists.

In Japan, Shinkansen has been contributing to the promotion of inbound tourism. A typical example is the Golden Route of inbound tourism along Tokaido Shinkansen. Approximately 60 % of the inbound tourists are on the Golden Route.

Inbound tourists arrive at Narita or Haneda international airport and visit Tokyo to enjoy Asakusa or Tokyo Disney Resort, etc. After that, they go to Nagoya by Tokaido Shinkansen to visit the automobile plant of Toyota Motor Corporation, etc. Then they go to Kyoto by Tokaido Shinkansen to visit the World Heritage temples or shrines. Lastly, they enjoy Osaka and Kobe and leave Japan from Kansai International Airport.

**Figure 7: The Golden Route**

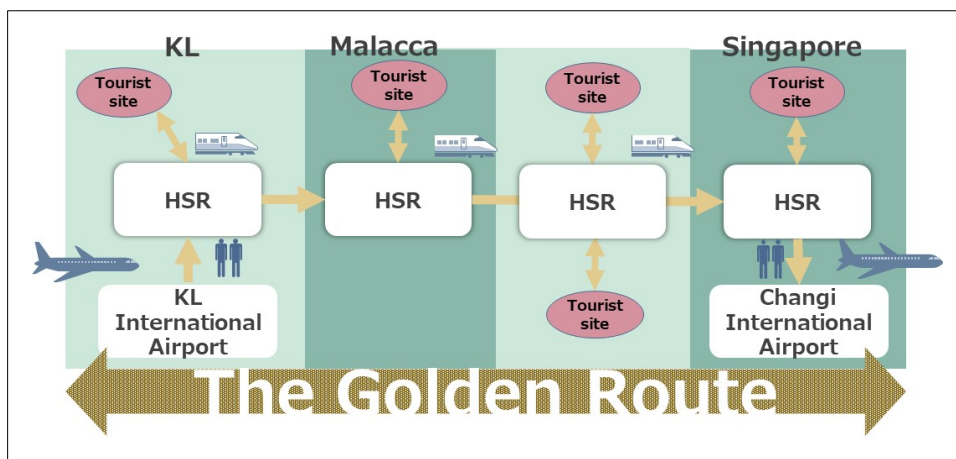


The most important aspect of the Golden Route is the cooperation among Shinkansen, the international airports, and the tourism sites along the Shinkansen.

Based on the above Japanese experience, we counseled Malaysia on the following recommendations:

- ✓ Develop an inbound tourism route that involves KL International Airport, Changi International Airport, Kuala Lumpur–Singapore HSR, and sightseeing sites along the HSR, including Malacca, the World Heritage.
- ✓ Develop tourism route like the Golden Route contributes to increased inbound tourists, not only for major sites such as Maracca, but for other sites in Malaysia.
- ✓ Improvement of connectivity between the HSR and major sightseeing spots and between the HSR and international airports is essential.
- ✓ Keys to success for development of tourism routes are:
  - Good accessibility between the HSR and international airports;
  - Improvement of railway service for inbound tourists;
  - Development of excursion tickets with IC, which includes the fare for the HSR, access transit, restaurants, shops, etc.
  - Have a leader/coordinator among stakeholders, and a support system.

**Figure 8: Implications for Malaysia (The Golden Route for Inbound Tourism)**



Source) MLIT: Study on Regional Economic Impact by introducing High Speed Rail in Overseas.

## 4. CONCLUSIONS

Last, I summarize the implications for emerging and developing countries that are planning to develop HSR in the future.

As for the relationship between HSR and regional development, HSR contributes to regional development. It is not just a sufficient condition; it is necessary condition for regional development. To use HSR for regional development is an ultimate goal and HSR-related measures should be conducted.

Since 1964, when Tokaido Shinkansen started its operation, Japan has been celebrating Shinkansen for over 50 years, and has abundant experiences of regional development

that make good use of Shinkansen. Thus, Japan is well-situated to conduct a transfer of knowledge in the field of infrastructure development and related regional development.

In the event that we proceed to convey Japanese experiences with HSR, the “back-casting approach” is effective for localization of Japanese experiences.

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