



High Speed Rail and Change in Korea's Spatial Structure

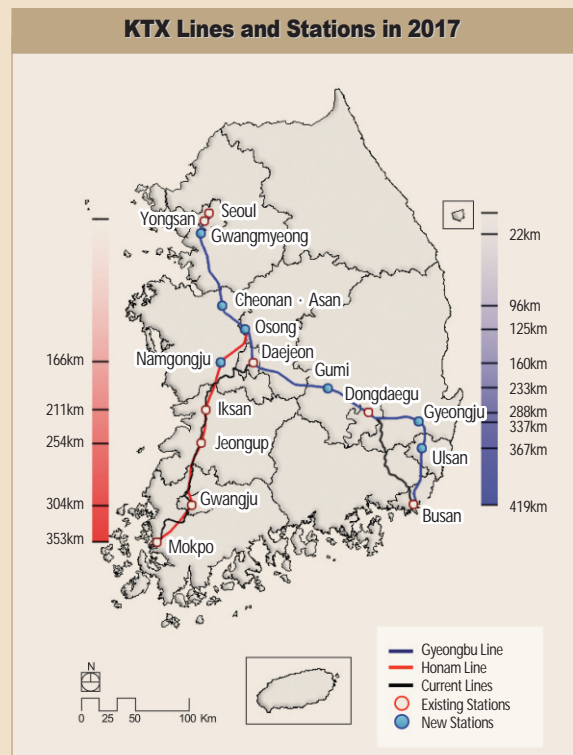
The Korea Train Express (KTX) has been running since April 2004 on the new high speed rail (HSR) system between Seoul and Dongdaegu, and on the conventional rails between Dongdaegu and Busan, and between Seodaejeon and Mokpo. The KTX is being operated in a similar way to the HSRs of France and Germany. In the meantime, both expectations and concerns have been raised with the KTX in terms of national and regional planning. As shown in Japanese and French cases, however, the effects of the HSR can be observed over a long period while they differ depending on regions. Therefore, it can be somewhat early to analyze the effects of the HSR on national spatial structure. Still, it is necessary to monitor the effects of the HSR in the beginning stages in order to set up a basic database for future studies.

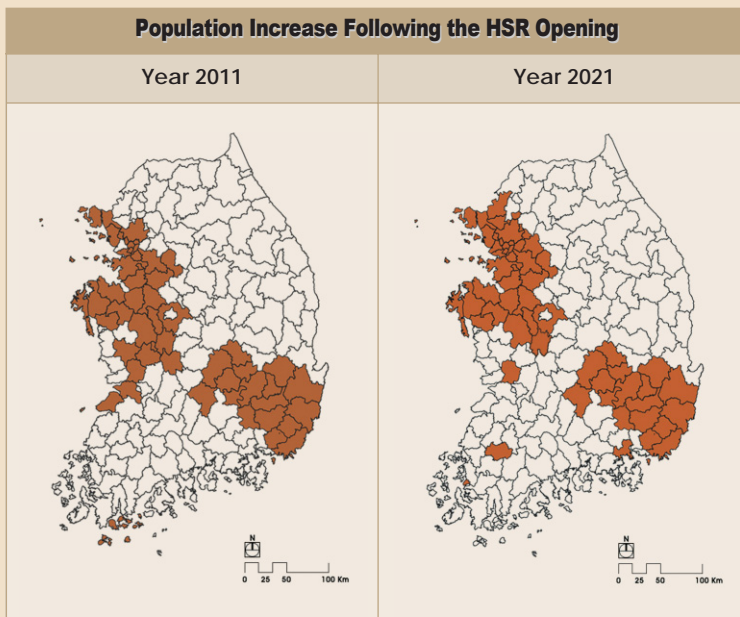
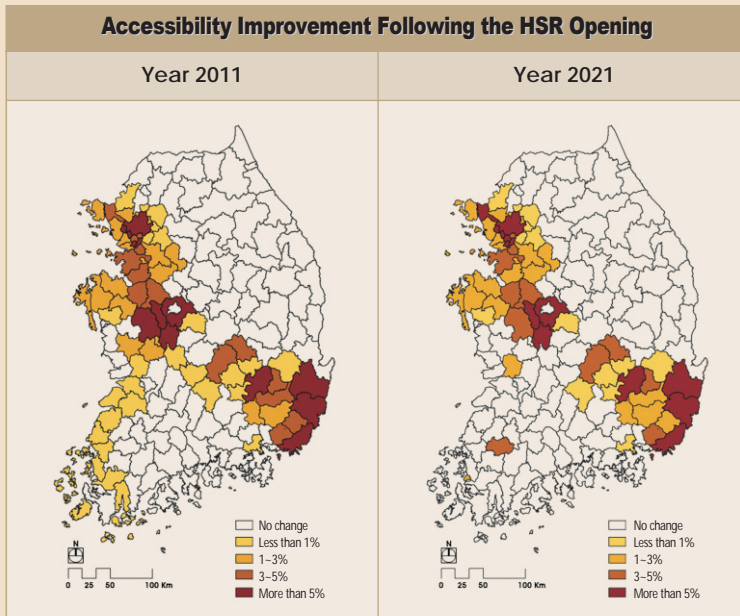
HSR Effects to Date

According to the study, launched in this context, the travel time of every city and county of the nation is expected to decrease with the opening of the KTX—by 290 minutes in 2011, when the Gyeongbu Line is fully open, and by 274 minutes in 2021 after the Honam Line is fully open in 2018. Also, improvements in accessibility after the KTX opening have been primarily witnessed in the capital region, Chungcheongnam-do, Daegu and Busan region, and on the west coast of the Honam region. Improved accessibility is expected to bring about changes in employment and population movement.

That is, improvement in accessibility will raise regional employment and population in cities with KTX stations and their surrounding areas.

To be specific, in 2011 and 2021, the populations of Chungcheongnam-do, Youngnam, west Honam region and the capital region are predicted to remarkably increase compared to those before the introduction of the HSR in 2004.





Note: The above cities and counties are those that are predicted to see population growth upon the opening of the HSR in 2011 and 2021 compared to the population before the HSR opening in 2004.

In the Honam region, only those cities with KTX stations are expected to see their population grow in 2021, not the surrounding areas. This means that improved accessibility does not necessarily result in a population increase in the entire region. The populations of Daegu, Ulsan, Gyeongju, Busan and

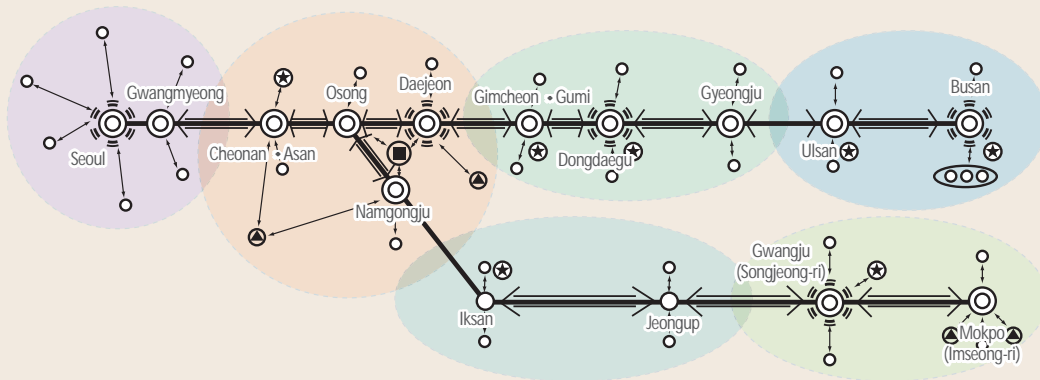
Gwangju are expected to increase significantly in 2021.

As time passes, it has been proven that the HSR areas have experienced growth. That is, as of November 2004, the ratio of HSR passengers from cities and counties other than those with KTX stations was 7.1%, but it increased to 12.4% in April 2006. The number of HSR passengers is continuously increasing; therefore, it is expected that links between regions will be further strengthened in the future. Exchanges such as business trips and commuting between large cities outside the capital region such as Daejeon, Daegu and Busan are expected to increase also. According to the study, the function and interrelationship between those cities with HSR stations strengthen, and they influence each other.

The results of an empirical analysis on Daejeon Station show that, unlike other large cities with KTX stations, a spatial change in Daejeon has occurred in the vicinity of the station after the HSR opening, though not highly distinguishable. In addition, of people dwelling in Daejeon, those who travel to Seoul using the KTX responded that they would have used other transportation modes if there had been no KTX service. This implies that the straw effect is not strong between Seoul and Daejeon. However, as for trips for specific activities such as buying high-priced goods, enjoying cultural events, and receiving high-quality medical treatment, the ratio

of trips to the capital region is predicted to be higher than the other way around. It has been found that at the beginning stage of the operation, this straw effect existed for these activities, although not strongly. It can also be seen that this effect has existed even before the introduction of the HSR.

Spatial Structure Change Following the HSR Opening : Multi-nucleic Network Type



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|----------------------------|--|--|--------------------------|
| Cities with KTX Stations : | Large City | New Growth Center | Regional Center |
| | Multifunctional Administrative City | Innovation City | Enterprise City |
| | | | Neighboring Major Cities |
| | Back-wash Effect from Regions without KTX Stations to Cities with KTX Stations | Back-wash Effect between Cities with KTX Stations | |
| | Interrelationship between Cities with KTX Stations and Regions with KTX Stations | Interrelationship between Cities with KTX Stations | |

To forecast the regional effects of the HSR, the study has categorized cities with KTX stations into three types: large cities, new growth centers and regional centers. According to the study, the effects of the HSR are most salient in new growth centers. Regarding the HSR effects, large cities with KTX stations are mostly concerned about the straw effect, under which their surrounding areas are absorbed into the capital region. New growth centers are mainly worried about the decay of traditional centers, and what challenges regional centers most is the potential straw effect into large cities with the opening of the HSR.

Future Directions

In order to reduce the straw effect, it is recommended that the spatial structure of the nation be reorganized into a ‘Multi-nucleic Network’ type that focuses on the development of areas surrounding KTX stations. However, the HSR alone will not make it possible to restructure regions. Rather, it depends on the policy responses by the central government as well as by each individual region. Furthermore, they should be linked with the potentials of local areas.

According to the study, it is recommendable to construct an ‘area-wide economic zone’ as a main tool for reorganizing the national spatial structure. In other words, to maximize the effects of the HSR, the following six area-wide economic zones are suggested in the study: the Capital, Jungbu, Daegu, Busan, Jeonbuk and Gwangju. The major tools are expansion of core functions of major cities and development of the transportation network between focal points, especially linking them to current national project sites that are under the balanced national development policy.

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**This research has been awarded the 2006 KRIHS Best Research Prize.*

Formulation of Area-wide Economic Zone

