

HIGH-SPEED IN KOREA CAPTURES TRAFFIC

by Iain Frew

During recent years the railway network in South Korea has suffered many of the problems faced by railways in Europe and North America. The infrastructure required major investment but passenger traffic was falling and private cars had captured a major share of the short (100 km) and medium (300 km) distance business with the airlines taking most of the longer (over 300 km) distance traffic. However the highways were overcrowded and congestion in the air was seen as a new problem. A solution was to build new high-speed railways that might attract new traffic to the rails. Korean place name spellings have been altered recently to fit the actual sound of the names given in brackets where the new name is first used.

A high-speed network was planned having the shape of an inverted Y linking five of the six largest cities in the nation. (Inchon, just west of Seoul, is the 4th largest city with 2 million inhabitants but lies off the new routes.) The Seoul - Busan (Pusan) corridor contains 71% of the population and had carried 66% of the passenger traffic. The new line starts at Seoul, (10.6m people), in the north west, and runs south to Daejeon (Taejon)(1m people) - 159 km, continuing south east as the Gyeongui Line to the nation's second city Busan (population 3.8m) - 412 km. A branch (the Honam Line) south west from Daejeon to Gwangju (Kwangju) (pop 1.2m), - and Mokpo (408 km) was planned initially as an upgraded electrified conventional railway able to be used by the high-speed trains.

Construction began in 1992 with planned completion in 2004 but an economic crisis hit South Korea in 1997 and delayed the completion of the network so that the first high-speed section did not open until 1 April 2004. By late 2007 the completed route extended from Seoul through Daejeon to DongDaegu (Taegu) 2.2m, 293 km, with high-speed trains continuing over the conventional railway to Busan. The high-speed railway to Busan will follow a new route sweeping to the east through ShinGyeongju (330 km) to Busan and although 4 km longer than the traditional route will allow much shorter travel times. The Homan Line has been electrified and track upgrades completed allowing faster travel times and following the success of this route work began in 2007 on the construction of a new high-speed route close to the older route. This will be fully opened by 2015.

There has been a striking speed-up of services with the Seoul - Busan journey cut from 4 hours 10 minutes to 2 hours 40 minutes and will fall to 1 hour 56 minutes in 2010 when the high-speed route to Busan is completed. The Seoul - DongDaegu journey fell from 3 hours 3 minutes to 1 hour 39 minutes, while closer to the capital the trip to Cheonan-Asan more than halved to just 34 minutes for the 96 km. The high-speed trainsets are to SNCF designs and comprise two power cars, two booster cars, and sixteen coaches. Twelve train sets were built in France and 34 more in South Korea. They had a top speed initially of 300 km/hour, now increased to 350 km/hour on selected

parts of the route, use thyristor control, and can seat 935 people. However a new train is being developed that will run at up to 400 km/hour with IGBT control. Ten-coach versions of the French design will operate Homan Line services. A tilting train design is also being developed that will help cut running times over conventional railways linked to the high-speed network.

The results of the high-speed railway have been striking although the increase in traffic overall falls a little short of early predictions due to the economic problems. Over shorter distances the railway has attracted a massive increase in commuter traffic to Seoul with journey times of under an hour as far out as Daejeon. During the first year there were 10,000 season ticket holders along the route and the total has risen by a further 10,000 every year thereafter. The private car carried a majority of passengers over the area served by the old railways but with airlines taking a significant share of traffic to DongDaegu and Busan. Following the introduction of the high-speed rail link air traffic to DongDaegu fell from 4,000 per day to just 220 while the Busan traffic fell

from 14,300 to 7,300. The flight time Seoul - Busan is only 1 hour and air will retain a good level of traffic until the final high-speed section to Busan opens in 2010. On the Honam Line air traffic to Gwangju has more than halved but bus traffic has held up since the road network allows competitive times. When the high-speed line reaches Mokpo the journey from Seoul will come down to 1 hour 46 minutes and a major shift from road to rail can be expected.

At present 8% of the short distance traffic is carried on high-speed services, 18% on conventional railways, 11% on buses and private cars retain 63%. 25% of middle distance passengers use high-speed trains, 15% the conventional trains, 36% use their cars, 23% use buses, and just 1% planes. Long distance traffic is split 57% on high-speed trains, 8% on conventional trains, 8% on buses, 17% in private cars, and just 10% fly. Korean Railways has been turned around by the introduction of high-speed services between the major centres cutting road congestion and removing much of the competing air traffic from the skies.