

Kehärata: Helsinki Airport's Ring Rail Line

Helsinki Metropolitan Area is served by Pääkaupunkiseudun lähiliikenne (Suburban Rail) network. Services are provided from the capital to Karjaa, Riihimäki, Lahti, Vantaankoski and, starting on 1 July 2015, on the Kehärata, the new Ring Rail Line. From 10 July 2015 the line served the capital's airport, but the station here was only completed on 17 March 2016.

In all there are 14 different services radiating from Helsingin päärautatieasema, Helsinki Central railway station. The inner suburban services are all-stations, while the outer suburban ones are limited-stop. In all, the 235 km, 1,524 mm gauge suburban network, electrified at 25 kV 50 Hz, consists of 60 stations, used by roughly 175,000 passengers each weekday.

Kehärata Construction

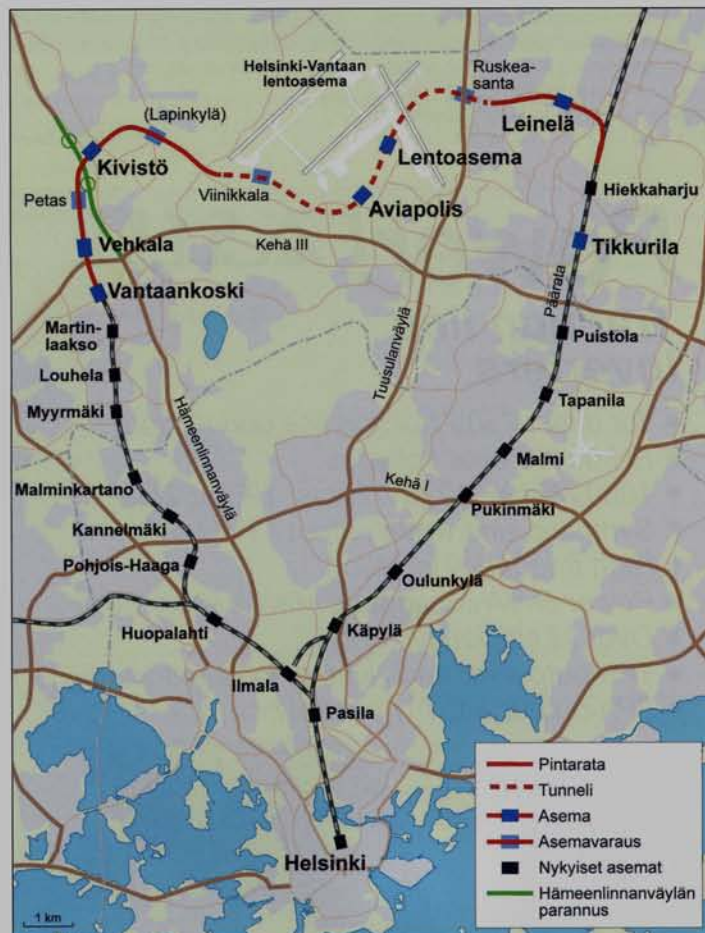
Construction of the Kehärata began on 13 May 2009, with the cost estimated at 773.8 million EUR. Financing was provided by Liikennevirasto, the Finnish Transport Agency, together with Vantaa municipal council, and Finavia, which is responsible for maintaining Finland's airports and air navigation systems. A certain amount of **funding** was

provided from the EU's TEN-T programme. The project also involved certain road improvements in the vicinity of the airport. Helsingin seudun liikenne (HSL), the Helsinki Regional Transport Authority, ensured good public relations in the run-up to starting construction of the line, involving local residents in the planning procedures. Feedback from around 1,400 households and individuals was used to modify and adapt the project.

The Kehärata is double track, 18 km long, designed for a maximum speed of 120 km/h, and electrified at 25 kV AC. The new line **runs from Vantaankoski** (15 km north of Helsinki) to Hiekkaharju. Vantaankoski was originally the terminus of suburban services from Helsinki, while Hiekkaharju is on the main line to Kerava and Riihimäki (and Tampere) or Lahti. There are five new



Photo: Jürg D. Lüthard
FLIRT EMU Sm5 009 calling at Lentoasema, which is spacious and well illuminated, designed for handling large numbers of passengers. At either end of the platforms there are three escalators and two large lifts accessing two separate exits, near the airport terminal building.



The central part of the Helsinki suburban rail network to the north of the capital, showing the Kehärata (red, the pecked line being the 8 km tunnel). Future projected stations are shown in light blue. Only the first part of the western line from Huopalahti to Karjaa is shown here. The line heading northeast serves Kerava and then Riihimäki or Lahti.

The very spacious multi-purpose area on board a Class Sm5 FLIRT EMU, with long rows of tip-up seats, a wheelchair harness point and a wheelchair-accessible WC cubicle.

stations, these in a clockwise direction (from Vantaankoski) being Vehkala, Kivistö, Aviapolis, Lentoasema (airport) and Leinelä. There are also plans to provide three more stations, Petas, Viikkala and Ruskeasanta, but no date has yet been fixed for the construction of these.

The most significant **civil engineering** structure on the Kehärata is an 8 km, twin-bore tunnel, where the line skirts the airport and runways. The twin bores of the tunnel have interconnecting galleries every 200 m to assist in emergency evacuations. Just east of Lentoasema, which serves the airport terminal, the bores pass underneath the northwest to southeast runway. Here it was necessary to use advanced protection techniques on the tunnel lining, to avoid the penetration of propylene glycol, which is used in winter for de-icing runways and taxi-ing areas for aircraft. This chemical is known to pollute subsoil, and its effects on concrete tunnel lining could be detrimental. The tunnel was completed in March 2012.

Inauguration And Operation

Inauguration of the line took place on 1 July 2015, but at that time Len-

toasema station was incomplete, being inaugurated on the 10th, still unfinished, with the only exit in use being the western one, the furthest from the airport terminal. The inaugural train departed from Helsinki terminus at 03.59 on the 1st, and for the remainder of the day there were local celebrations organised by HSL, VR and Vantaa municipality. In December 2015 it was at last possible to access the airport terminal by lift, and on 17 March 2016 the final touch came with the putting into operation of the 72 m long escalators. During the eight months prior to completion of the facilities at Lentoasema a free shuttle bus service was provided, first between Aviapolis and the terminal, and then from the western exit at Lentoasema.

Using the clockwise service, **journey time** from Helsinki terminus is 27 minutes, and 32 minutes on the anticlockwise service. Passengers changing to the latter service from long distance trains at Tikkurila have a roughly eight-minute journey. From Helsinki terminus on weekdays the service (August 2016) runs from 04.29 to 00.14, and from the airport at 04.56, the last departure being at 01.16. During the period from 06.00 to 18.00 there are departures from Helsinki (and hence from



Photo: Jürg D. Lüthard



On 19 January 2015 construction was in progress at Lentoasema. The double track is in place, and so is the 230 m long island platform, of sufficient length to accommodate three Class Sm5 EMUs running in multiple. The structure in the left foreground is the housing for the 72 m long escalators, which rise to the surface 45 m higher than the tracks.

the airport) every ten minutes. At weekends frequencies are somewhat reduced.

One of the other benefits of the new line is that it serves the outer suburbs and neighbouring cities, such as Vantaa, in the vicinity of the airport, and has resulted in a fall in dependency on bus services to and from the city centre. In autumn a new east-to-west bus service, 28 km long, linked Malmi and Myyrmäki stations.

The services are provided by the recently acquired batch of Class Sm5 FLIRT EMUs. These were ordered by Pääkaupunkiseudun Junakalusto Oy (JKOY - Helsinki Metropolitan Area Rolling Stock Owner) from Stadler, the contract being announced on 21 October 2014. Deliveries started in early spring 2016 and are scheduled for completion in spring 2017 (see R 2/16, p. 10). Numbered 42 to 75 (following on from the earlier batch of FLIRTs acquired by JKOY for suburban services), they wear a new purple and white livery, HSL using different liveries to denote vehicles used for different purposes. Purple and white is worn by local trains which do not belong to VR, while metro

trains and buses used on trunk routes are orange, local buses are blue, and trams are green and yellow.

Compared with the earlier FLIRTs in use in the Helsinki district, this latest batch incorporates a number of design **modifications**. The passenger information systems are of an upgraded version and power points have been provided. There are wider corridors in end cars, 2 + 3 seating configuration in some sections reduced to 2 + 2, more tip-up seats and more space provided in the entrance vestibules to facilitate passenger movements within the train, as it is expected that these new trains will be used most of the time on services to and from the airport.

On 17 November 2015 HSL decided to authorise JKOY to order six more FLIRT EMUs. These will be used to strengthen service frequencies in the outer suburbs. Services to Kirkkonummi, Kerava and Järvenpää have also been mentioned as possibilities for these new trains.

Jan Dvořák

Photos unless cited:
Liikennevirasto



Tikkurila station, close to Vantaa town centre, has been substantially rebuilt to serve as an interchange between Kehärata services and long distance trains to and from central and northern Finland. The station is also served by suburban trains to and from Riihimäki and Lahti. This photo was taken on 27 November 2014. The original red brick station building, dating from 1862, is situated immediately to the south of the new one, and is now Vantaa urban museum.



To the east of Helsinki airport the Kehärata comes to the surface before Leinelä station. Note the hard rocky nature of the sub-strata, which meant that the construction of the new railway involved a lot of blasting.

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