

Trams Return To Kehl: Strasbourg Revives International Link



Strasbourg's second-generation urban tramway network dates from 1994, 34 years after the demise of the first network. 29 April 2017 saw the restoration of tram services across the Rhein to Kehl, in Germany, with the recasting of international local bus services and faster public transport journey times.

The Original International Network

The history of trams in Strasbourg dates back to 1877, with electricity replacing horses in 1894. The network comprised both urban and interurban lines, and increased in length to 234 km (83 km urban, 151 km interurban) by 1930. One of the interurban lines, inaugurated on 14 March 1896 crossed the Rhein to Kehl, and on the right bank of the river a 95.5 km 1,000 mm gauge network developed, serving Rastatt, Bühl, Offenbourg and Seelbach. Until 1918 the whole Strasbourg network was situated within the **German Empire**, and following the First World War the land on the right bank of the Rhein became part of the Republic of Baden, that on the left bank becoming French territory.

The tramway network east of the Rhein was first taken over by Deutsche Reichsbahn, then in 1923 by Mittelbadische Eisenbahnen. The international line was subsequently cut back to the Rhein bridge, being extended on 24 May 1942 to Kehl station, with an unfulfilled project to extend to the Rathaus (Town Hall). The right bank network was **closed** in stages between 1959 and 1980.

The last trams ran on the first-generation Strasbourg network on 1 May 1960, though increasing urban road congestion in the late 1980s prompted consideration of a **new** rail-based public transport system, the first of a fleet of 26 new seven-car Eurotrams, ordered

in 1991, running on the 9.8 km Line A on 25 November 1994. The Eurotrams, fleet numbers 1001 to 1026, were designed for the Compagnie de Transports Strasbourgeois (CTS) and originally built by ABB/Adtranz. In 1996 the second batch of ten was ordered, with fleet numbers 1031 to 1040, again seven-car, 33.1 m long vehicles, built until 1999. This was followed by 43.05 m nine-car Eurotrams/Cityrunners, with fleet numbers 1051 to 1067, built between 1998 and 2000.

The New Network Expands

When shortly after the turn of the millennium new extensions to the network were built, more trams were needed, and in 2003 a batch of **41 Citadis 403** trams was ordered from Alstom, deliveries starting in 2005, the 45.06 m long vehicles with fleet numbers 2001 to 2041 having a similar appearance to the Eurotrams.

With a view to future network extension projects, in 2014 CTS signed a framework agreement with Alstom for 50 more Citadis trams. The initial order was for **12 trams**, worth 41 million EUR, which were put into commercial service on 29 April 2017, carrying the fleet numbers 3001 to 3012. Since they were intended for the new line to Kehl,

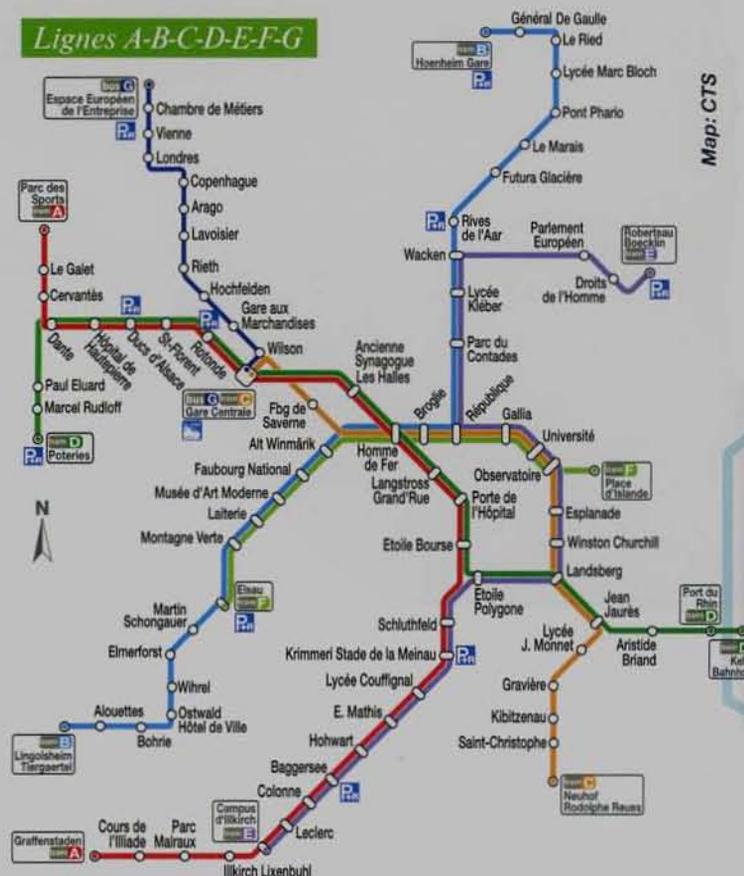
A recent map of the Strasbourg tramway network. Line D is shown in dark green running from west to east.

Tests running involving a pair of Citadis trams built for the batch ordered in 2003 on 24 April 2017. Here they are crossing the Pont Citadelle, named after the nearby fortress built by Vauban, which was demolished in 1815. The height of this 163 m long bridge is sufficient for the barge traffic which uses the Vauban basin. The arch bowstring is 40 m high in the centre while the bridge deck, incorporating a footpath and cycleway, is 20 m wide.

they had to meet design requirements for trams in both France and Germany. They are also the first Citadis trams to be designed to meet the BOStrab German federal regulations applying to trams, and have thus paved the way for Alstom to design and build trams for operators in Germany in the future. BOStrab au-

thorisation is now valid for all Strasbourg's Citadis.

These latest Strasbourg Citadis are 45.5 m long, rated at 720 kW, and have a top speed of 70 km/h (maximum line in tunnels is 60 km/h and elsewhere 50 km/h). They each have 60 seats and space for up to 228 standees,



are fitted with LED lighting and full-length glazed entrance doors. They meet the regulations concerning handicapped rail travellers in both Germany and France, and are thus fitted with easily accessible door open buttons, wide seats, a multipurpose area with wheelchair harness points, and storage areas for prams. A new passenger information system with 38-inch TFT screens is installed.

Construction took place at Alstom's Ayrè works, near La Rochelle, with the traction motors coming from the Omans works, the bogies and suspension from Le Creusot, the other traction equipment from Tarbes, and other electronic components from Villeurbanne. Saint-Ouen was responsible for design, while Alstom's Salzgitter factory supplied the end bogies situated under the cabs. These trams are used mainly on the extension of Line A to the centre of Illkirch-Graffenstaden, inaugurated on 23 April 2016, and also on the recently completed extension of Line D to Kehl.

The second option in the framework contract was taken up on 3 February 2017, and is for **ten more Citadis**, worth 28 million EUR.

Restoring The Kehl Link

Several years of debate and public consultation preceded the final decision to extend Line D from Strasbourg to Kehl. The first **studies** started 2008-2009, and in November 2009 Strasbourg and Kehl municipalities signed a MoU outlining how the project was to be co-financed. The co-financing agreement itself was signed on 15 March 2012, this also covering issues involving how the project was to be realised and how the future line was to be operated. The project was costed at 90 million EUR, the stretch of line on the French side (left bank) of the Rhein at 67 million EUR and the German section 23 million EUR.

The construction of **Line D** on the left bank of the Rhein started in the late 1990s, with the section between Rotonde and Étoile Polygone being inaugurated on 31 August 1998, most of this route being shared with Line A. The extension from Étoile Polygone to Aristide Briand in the suburb of Neudorf Est, shared in part with Line C, was inaugurated on 25 August 2007, while in the opposite direction, to the west of Strasbourg city centre, the stretch from Rotonde to Poteries was inaugurated on 30 November 2013, this shared with Line A as far as Dante.

Construction of the 2.7 km of **international tramway**, linking Aristide Briand, Port du Rhin and Kehl-Bahnhof (railway station), started on 24 February 2014. The main civil engineering project involved two new bridges spanning the Rhein and the Vauban basin. The possibility of converting the Pont de l'Europe road bridge over the Rhein for tramway use was regarded as too difficult, and it would only have been possible to lay a single track.

Therefore a new **bridge** over the Rhein, the Pont Beatus-Rhenanus, 290 m long and 16 m wide, was built by



On 24 April 2017 one of the Citadis ordered in 2003 crosses the Pont Beatus-Rhenanus over the Rhein. Construction of this bridge started in June 2014. It is situated immediately downstream from the Pont de l'Europe road bridge, a short way upstream from the bridge which carries the railway from Kehl to Strasbourg (visible at the background), and around 1 km east of the Pont Citadelle. Although this 290 m long, 16 m wide bridge has two spans, the centre pillar, in the middle of the Rhein, will not create an obstacle to shipping. The structure of the bridge was built in Belgium, then moved to Kehl on board barges, in April and July 2015, being assembled on the German bank between February and August 2015, with completion in November 2015. Both bowstring arches are 20 m above the river.

the Bouygues consortium (Bouygues TPRF, Victor Buyck Steel Construction, Früh Ingenieurbau, Lingenheld, Arcadis and Marc Barani), while Alstom's infrastructure teams were involved in the design and installation of the overhead wire (750 V DC) and of the tracks on this bridge and the adjacent Pont Citadelle, which has a single span of 163 m long and is 20 m wide, over the Vauban basin. In addition to the double track tramway, there is also a broad cycleway and footpath.

There are two bridges under the railway tracks serving the port area at Kehl and under the railway from Strasbourg-Ville to Port du Rhin, and immediately to the east of these, just beyond the stop serving Port du Rhin, there is a short stretch of artificial tunnel to the south of the residential estate served by this stop. Two more stops are planned on the French bank of the Rhein, at Citadelle and Starcoop, either side of the Pont Citadelle.

On 24 and 25 September 2016 the general public was invited to walk over the route of the new tramway, **test running** starting on the left bank of the Rhein on 10 January 2017, and the first tram crossing the two new bridges over the Rhein and the Vauban basin on 3 February. The formal inauguration took place on 28 April 2017, attended by the Mayors of Strasbourg, Roland Ries and Kehl, Toni Vetrano, with public services starting the following day.

The new tramway currently terminates at Kehl-Bahnhof, thus restoring the situation which existed in the early 1940s. As then, there is a project for a further 1.2 km **extension** east and south to a terminus adjacent to Kehl-Rathaus, with an intermediate stop serving Hochschule. Kehl urban council is to be responsible for the construction of this extension, scheduled for completion by late 2018 and costed at 38 million EUR.

Services on the extension of Line D to Kehl run at eight-minute headways in peaks and at 12-minute headways in off-peak periods. At Kehl station the existing Park/Ride car park has been enlarged. Compared with the international urban bus service which the trams now replace, the journey by rail between Kehl-Bahnhof and the Place de l'Homme de Fer or the main SNCF station in Strasbourg takes 12 minutes less - around 25 minutes.

To promote usage of the line, a new multiple-trip „Badgeo multi“ card, made of plastic, was introduced, on sale at local tourism offices. It can be recharged with up to 30 more trips at ticket machines. If ten journeys are bought in advance the cost of a single trip from Kehl to Strasbourg comes down from 1.70 EUR to 1.32 EUR. If 30 journeys are paid for in advance, the cost for a single trip is just 1.27 EUR.

The whole project to restore the tramway link between Kehl and Strasbourg forms part of Strasbourg's Schéma des transports collectifs 2010 - 2025, covering the **development of**

public transport in the urban area for this 15-year period. Urban development, involving industrial and logistics complexes, is planned in the area served by the line between Aristide Briand and the Rhein, and this will serve as a traffic generator. The new tramway will also open up new public transport possibilities for the residents of Kehl.

In general international communications within the area defined as the Strasbourg-Ortenau Eurodistrict will be enhanced, with a greater incentive for people to switch from private cars to public transport, thus reducing noise levels and improving air quality. It is estimated that there are at present around 30,000 **commuting** movements daily between Strasbourg and Kehl, and the new tramway is expected to cover the travel requirements of between 11,500 and 25,000 people in Strasbourg and between 15,000 and 17,000 people in Kehl.

Bohuslav Kotál,
using Alstom and CTS sources
Photos unless cited:
Jürg D. Lüthard



One of the new Citadis trams on a test run on 12 May 2017, crossing the Pont Citadelle.