

Die Kombilösung:
**Increasing mobility,
on so many levels.**



Karlsruhe's transportation infrastructure project

KARLSRUHE'S COMBINED RAIL AND ROAD TUNNEL PROJECT: 'DIE KOMBILÖSUNG'



A high-tech boomtown, Karlsruhe is world-renowned for its cutting-edge research and innovative spirit. But it's not resting on its laurels. This is why it launched a major infrastructure project, known as 'Die Kombilösung' in German, to overhaul its transportation infrastructure. The aim: increase quality of life for residents, and make the city even more attractive for visitors and businesses.

Karlsruhe's state-of-the-art hybrid tram-train system enables passengers to travel from surrounding towns and villages directly into the heart of the city – without having to change lines. This is possible thanks to special tram-trains that use direct current on the tram tracks, and alternating current on the Deutsche Bahn rail network. But this convenience comes at a cost: the tram-trains travel down Kaiserstrasse, a bustling shopping boulevard in the city centre, at a rate of one per minute. And this figure is set to increase, as passenger numbers are climbing. In 1997, two years after it was founded, Karlsruher Verkehrsverbund (KVV), Karlsruhe's light-rail system operator, transported 123.6 million people. By 2000, this number increased by 20 million. And by 2010, it skyrocketed to 176.6 million. These numbers are the driving force behind the city's project, which comprises two indivisible elements: a rail tunnel with a branch tunnel for south-bound lines, which will make room for a rail-free pedestrian zone aboveground. And an attractively landscaped tram line built on top of a road tunnel underneath Kriegsstrasse. Making it easier to get around the city than ever before.

COSTS AND FUNDING

According to figures from September 2011, the total costs for the project will be 640.9 million euros. Of the costs that qualify for state funding, the German federal government will cover 60 per cent, and the state of Baden Württemberg 20 per cent. Karlsruher Schieneninfrastruktur-Gesellschaft (KASIG), a company established for carrying out this project, is responsible for the remaining costs.

THE RAIL TUNNEL

Why is Karlsruhe moving the tram tracks below Kaiserstrasse? Because there is so much to see and do on the main shopping boulevard and market square. And soon, you will be able to do much, much more. Like going for a relaxing stroll with friends, people-watching while sitting outside a



café, or nipping across the street without having to cross the tracks. Soon, this will all be reality. Because starting in 2019, after the new tram lines on Kriegsstrasse are completed, the pedestrian zone will be entirely rail-free. The new double-track tunnel directly under Kaiserstrasse will span 2.4 kilometres and include the Europaplatz, Lammstrasse, Kronenplatz and Durlacher Tor stations. The branch tunnel for south-bound lines will connect the Marktplatz, Ettlinger Tor and Kongresszentrum stations. This will reduce wait times, make it easier to get around Karlsruhe and the surrounding region, and make the city an even more attractive destination for visitors. Even better: once the rail tunnel is completed in 2017, the number of trams traveling down Kaiserstrasse will be slashed by 70 per cent.

Length of Kaiserstrasse rail tunnel:	2.4 km
Length of southern branch of rail tunnel:	1.0 km
Number of underground stations:	7
Length of rail-free pedestrian zone:	1.0 km

THE KRIEGSSTRASSE TUNNEL

When you think of Kriegsstrasse, the main road going through downtown Karlsruhe, what would you change to make it easier to get around, and increase quality of life in the surrounding neighborhoods? Would you create a tunnel for through traffic between Karlstor and Ludwig-Erhart-

Allee? And use the new-found space for an attractively landscaped tram line with overground stops, a tree-lined boulevard, bicycle paths and safe pedestrian crossings? Then we've got great news for you: in 2019, Kriegsstrasse will become a beautiful boulevard with an excellent transportation infrastructure – and a highly desirable place to live. Thanks to this re-design, Karlsruhe's southern districts will be better connected to the city centre. The tunnel will make driving through the city faster and more convenient, and the Kriegsstrasse line will expand and enhance Karlsruhe's public transport network. What's more, once the Kriegsstrasse project is complete, all tram-trains will be routed through the Kaiserstrasse tunnel – making way for a rail-free pedestrian zone aboveground.

Length of road tunnel:	1.4 km
Length of tram line:	1.4 km
Number of stations above ground:	5
Number of tunnel entrances/exits:	2



MAP OF THE AFFECTED AREA

- Road tunnel
- Rail tunnel
- Rail-free pedestrian zone
- Overground tram and train network
- Tram-trains approaching the entrance to the rail tunnel
- Overground tram-trains within the affected area

- 1** Helmholtz-Gymnasium tram-train stop
- 2** Grashofstrasse overground stop
- 3** Kaiserallee rail tunnel entrance
- 4** Kaiserstrasse West overground stop
- 5** Europaplatz overground and underground stop
- 6** Lammstrasse underground stop
- 7** Marktplatz underground stop
- 8** Kronenplatz underground stop
- 9** Kronenplatz overground stop
- 10** Durlacher Tor underground stop
- 11** Durlacher Tor overground stop
- 12** Durlacher Allee rail tunnel entrance
- 13** Gottesauer Platz overground stop
- 14** Karlstor road tunnel entrance

- 15** Karlstor Süd overground stop
- 16** Karlstor Ost overground stop
- 17** Ritterstrasse tunnel entrance/exit
- 18** Lammstrasse tunnel entrance/exit
- 19** Ettlinger Tor overground stop
- 20** Ettlinger Tor underground stop
- 21** Mendelssohnplatz Ost overground stop
- 22** Mendelssohnplatz Süd overground stop
- 23** Ludwig-Erhard-Allee road tunnel entrance
- 24** Kongresszentrum underground stop
- 25** Ettlinger Strasse rail tunnel entrance
- 26** Augartenstrasse overground stop
- i** Extension of tram-train line to Durlacher Allee via Schlachthausstrasse

THE UNDERGROUND STATIONS

Bright, spacious, easy to get around, and with a modern flair: the new underground stations are far from the dingy, uninviting stereotype. The stops were designed with the requirements and wishes of today's passengers in mind, and no detail has been overlooked. All street-level entrances feature boards that provide real-time information on train schedules. Escalators, lifts and staircases lead to attractive concourses, where signs clearly point the way to the correct platform. From there, passengers enter a fascinating world underneath the hustle-and-bustle above. Thanks to an out-of-the-ordinary lighting concept, people and objects cast colourful shadows onto the floor, walls, and ceilings. To emphasize this effect, all platform surfaces will be white. And thanks to sophisticated systems for fire safety, communications and video surveillance, travelling through the new tunnel will not only be highly convenient and enjoyable, but also very safe.



CONVENIENT AND ACCESSIBLE

Well-lit, easy to get around, and safe: the state-of-the-art stations meet all passenger requirements. All areas of the underground stops can be reached without additional assistance. The platforms have ample space for manoeuvring, and are the same height as the floors of Karlsruhe's tram-trains: enabling passengers to board without having to step up or down. This is particularly important for wheelchair users, senior citizens, and parents with baby buggies – and reflects the architects' commitment to putting people first.



SEVEN UNDER- GROUND STATIONS

When the rail tunnel opens in 2017, passengers will be able to board the train at seven conveniently located underground stops in the city centre.



Europaplatz

For trams-trains coming from the west, Europaplatz is the first stop in the tunnel. The underground station will have entrances to neighbouring shopping centres. Overground lines from Karlstrasse and Kaiserstrasse in the west will continue to depart from the overground stop.



Lammstrasse

The Lammstrasse stop is conveniently located in the middle of the pedestrian zone, which will be rail-free from 2019. Passengers can access shops directly via underground entrances, or take the escalator, stairs or elevator up to the new promenade.



Marktplatz

The stop at Marktplatz is right in the heart of the city. It has a direct connection to Mühlburger Tor and Durlacher Tor. Hauptbahnhof, Karlsruhe's central station, is also within easy reach via the southern branch of the rail tunnel.

Kronenplatz

The Kronenplatz stop is right on the doorstep of Karlsruhe University of Applied Sciences, located on the eastern end of the pedestrian zone.

The overground stop will continue to serve lines to Durlacher Tor and southern districts of the city.



Durlacher Tor

The first underground stop when arriving from the east is Durlacher Tor. The station has a direct connection to Marktplatz and Mühlburger Tor. Trains to Fritz-Erler-Strasse or Waldstadt will continue to depart from the existing overground stop.



Ettlinger Tor

Ettlinger Tor boasts a spacious and inviting concourse directing passengers to trains travelling to the city centre or Karlsruhe's main station. The station also has direct underground access to the ETTLINGER TOR shopping centre.



Kongresszentrum

The Kongresszentrum stop features skylight shafts that provide natural lighting. While shoppers on street level savour the traffic-free pedestrian zone, rail passengers below enjoy convenient connections to the city centre and the main station.



CONSTRUCTION WORK

Excavating tunnels in the middle of the city entails extensive construction – that’s a matter of course. But it’s vital to ensure that the impact on residents, visitors and drivers will be minimal. How will this be possible? Firstly, elements of the project will not be carried out simultaneously, but in a series of meticulously planned phases. And second, the chosen construction methods are truly state-of-the-art: such as tunnel-boring using a tunneling shield. This means that while the boring machine will be making its way through the city underneath our feet, life will go on as usual aboveground. The stations under Kaiserstrasse and the market square will be constructed using the tried-and-trusted cover-and-cut method. This will dramatically reduce the amount of time required for overground construction, as the lion’s share of work will be carried out underneath the finished tunnel roof. The tunnel for the south-bound lines, spanning a comparatively short distance between Marktplatz and Ettlinger Tor, will be erected using the New Austrian Tunneling Method. The bottom-up cut-and-cover method will be deployed between Ettlinger Tor and Augartenstrasse, and underneath Kriegsstrasse, due to the tunnels’ shallow depth at these sites.



CUTTING-EDGE: TUNNEL CONSTRUCTION WITH A TUNNELING SHIELD

The rotating cutting shield is over 70 metres long, weighs 300 tonnes, and boasts a diameter of over 9 metres. The tunnel boring machine is set to dig its way through the ground underneath Kaiserstrasse, advancing 10 metres each and every day. The cutting shield is equipped with disc cutters – ideal for grinding up soil and rocks. As the machine moves forward, it lines the space directly behind it with reinforced concrete. The result: a tunnel shell made of reinforced-concrete rings.

ONE PROJECT, MANY PHASES

- 2010** 'Die Kombilösung' kicks off. Building work begins at the Europaplatz, Lammstrasse and Kronenplatz underground stops.
- 2011** Construction starts at the Durlacher Tor stop. The tracks are shifted north. The Gottesauer Platz stop is shifted east. Work starts on the northern part of the Ettlinger Tor underground stop.
- 2012** Excavation of the other side of the road begins at the three stops on Kaiserstrasse. Pedestrians and traffic can use the opposite side of the street, which has already been completed. Work begins on the Helmholtz-Gymnasium and Grashofstrasse stops, and the tunnel entrance at Durlacher Allee.
- 2013** All street-level construction work at stops on Kaiserstrasse is complete. At the end of 2013, work on the southern part of the tunnel begins with the construction of the Marktplatz and Kongresszentrum stops.
- 2014** A tunnel boring machine is digging away under Kaiserstrasse - without disturbing life above-ground. And, only a few metres from the tunnel entrance at Ettlinger Strasse, building work is beginning on the above-ground Augartenstrasse stop. In 2014, work also starts on the tunnel entrance at Kaiserallee.
- 2015** The transformation of Kriegsstrasse begins.
- 2017** The rail tunnel opens in 2017, immediately reducing the number of trains and trams on Kaiserstrasse by 70 per cent. On Kriegstrasse, the tunnel connecting the entrances at Karlstor and Ludwig-Erhard-Allee is built. When the tunnel is complete, construction of the tram-train tracks can start. When the tracks on Kriegsstrasse go live, the rail-free pedestrian zone in the city centre can become reality.
- 2019**

'DIE KOMBILÖSUNG' IN THE K. PAVILION



Experience Karlsruhe's infrastructure project up-close and personal at the multi-media exhibition located in the K. pavilion at Ettlinger Tor. Visitors can look forward to highly realistic projections of the planned underground stations, 3D animations on the interactive touch-controlled display table, and a great view of the city, including all construction sites, from the tower.

INFO PAVILION OPENING HOURS:

Monday to Saturday: 10 am – midnight
Sundays and holidays: noon – midnight
Staffed by 'Die Kombilösung' experts:
Monday-Saturday, 10 am – 6 pm

YOU'VE GOT QUESTIONS? WE'VE GOT ANSWERS!

Got a burning question? Then don't hesitate to contact Karlsruher Schieneninfrastruktur-Gesellschaft (KASIG). Simply give us a call on +49 (0) 721 133-5577 or write us an email to info@diekombiloesung.de. We are happy to help you. Additional information is available at: www.diekombiloesung.de



All information in this publication is subject to change.

KASIG

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