

# VISION MOBILITY FUTURE

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WHAT IS THE STUTTGART-ULM  
RAIL PROJECT?

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INFRASTRUCTURE FOR THE FUTURE,  
THE NEW MAIN STATION,  
FACTS AND FIGURES.

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AUGMENTED REALITY

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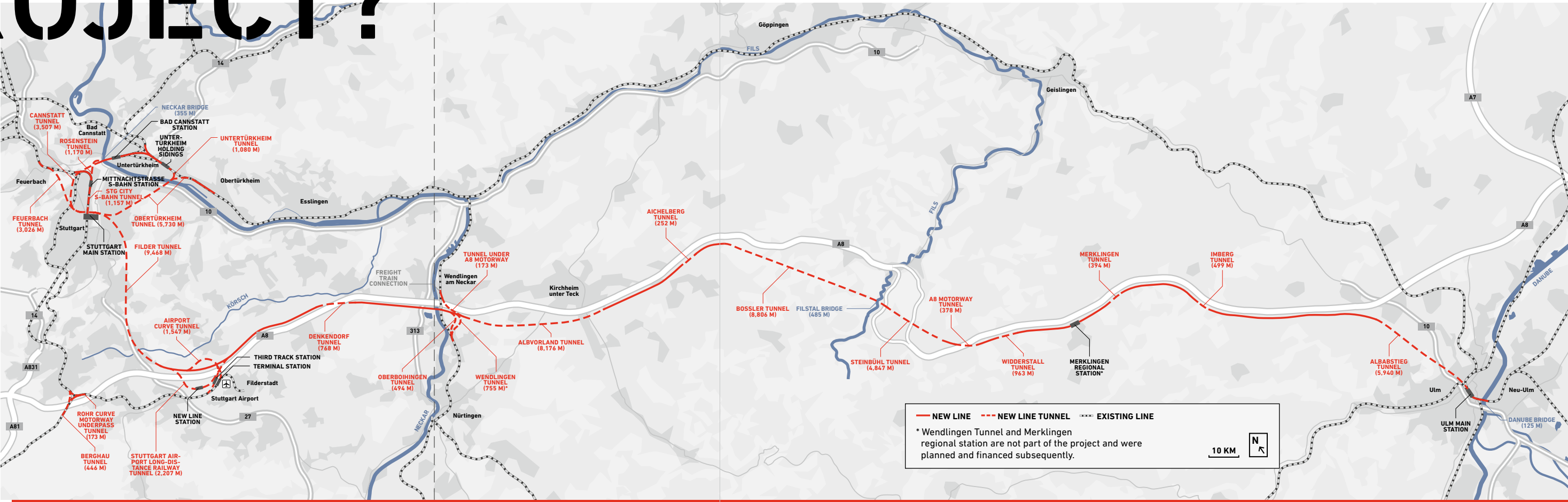
# THE PROJECT AT A GLANCE

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TWO SUB-PROJECTS,  
A HOST OF BENEFITS

# WHAT IS THE STUTTGART- ULM RAIL PROJECT?

ITS PROJECT



Stuttgart 21 | New Wendlingen-Ulm section

THE STUTTGART-ULM RAIL PROJECT  
CONSISTS OF TWO SUB-PROJECTS:  
STUTTGART 21 AND THE  
NEW WENDLINGEN-ULM SECTION.

Around 120 kilometres of new track are being built.

The Stuttgart-Ulm Rail Project will bring tremendous changes and improvements for Stuttgart and the State of Baden-Württemberg. 75 percent of people in Baden-Württemberg live in rural districts which will benefit from reduced journey times and a greater number of direct connections. The Stuttgart-Ulm Rail Project is also boosting the region's economy. It will create thousands of new jobs. Not only during the construction period, but also beyond. The project is encouraging investment and bringing money to the region.

Thanks to shorter journey times, the economic centres of Stuttgart, Ulm and Munich are growing closer together.

The owner of the Stuttgart-Ulm Rail Project is Deutsche Bahn, which is tackling the project together with its partners. These are:

- ↳ THE FEDERAL REPUBLIC OF GERMANY
- ↳ THE STATE OF BADEN-WÜRTTEMBERG
- ↳ THE STATE CAPITAL OF STUTTGART
- ↳ THE VERBAND REGION STUTTGART AND STUTTGART AIRPORT.

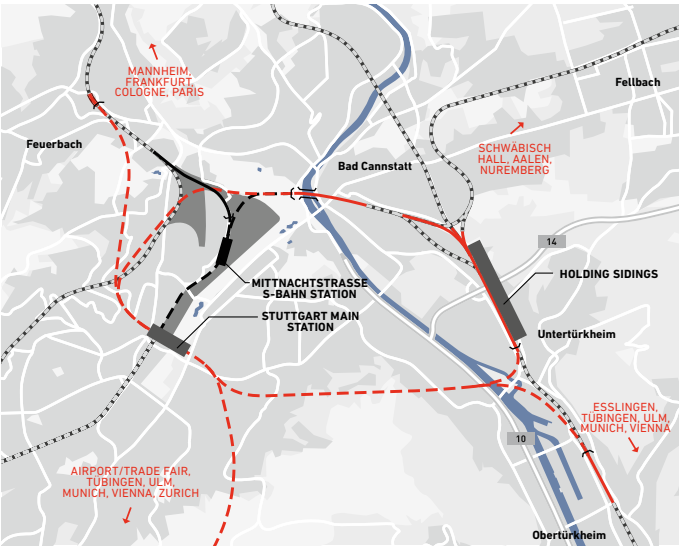
The project is also being funded by the European Union through the federal government.



STUTT GART 21:  
FOUR STATIONS AND AROUND  
57 KILOMETRES OF NEW TRACKS.

The Stuttgart 21 project goes far beyond the high-profile remodelling of the main station. The entire Stuttgart rail hub will be restructured. In the process, the rail network will be expanded. Around 57 kilometres of tracks are being laid for long-distance and regional trains as well as S-Bahn traffic. In addition, four stations will be built as part of the project:

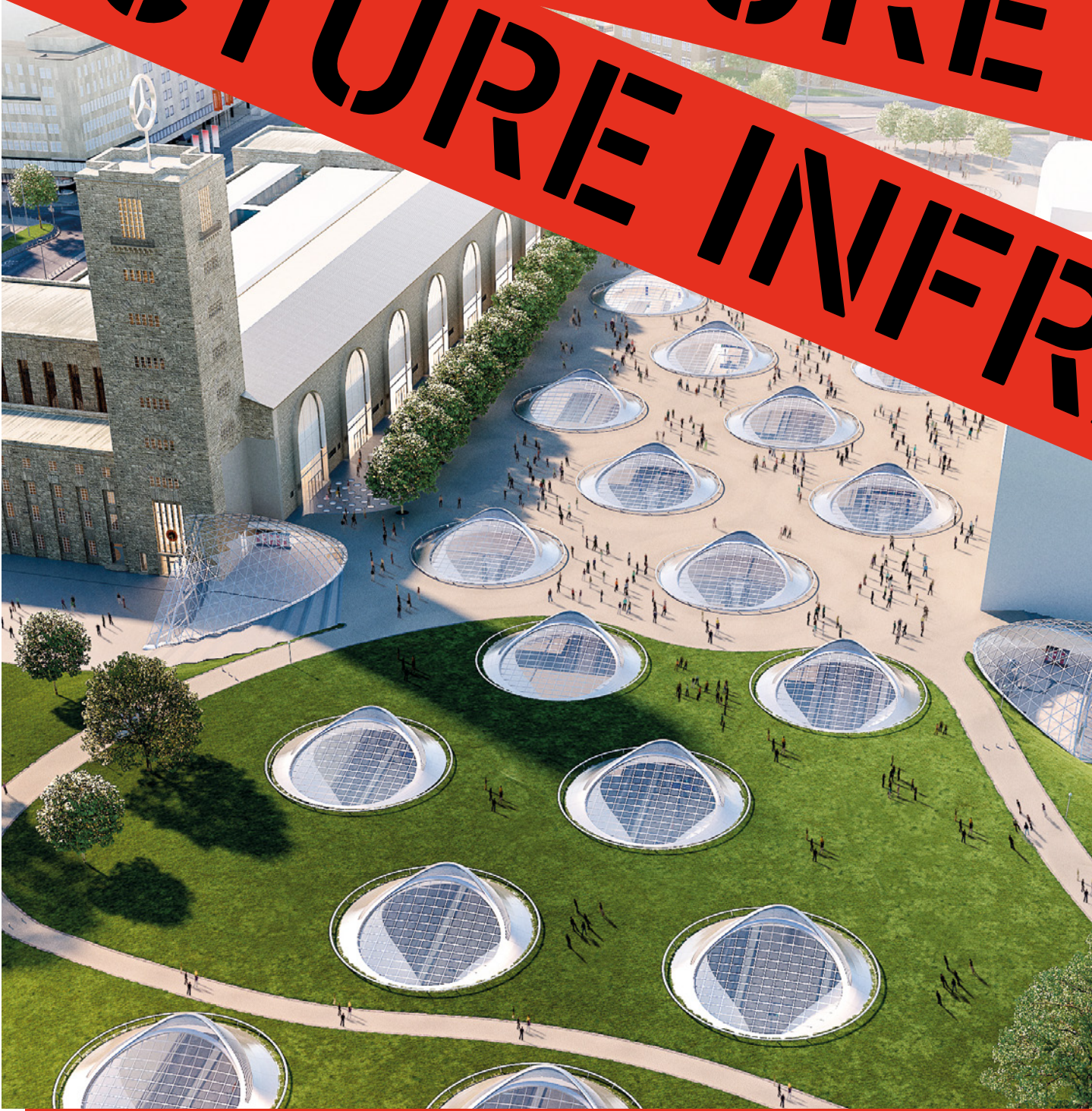
- ↳ THE MAIN STATION AS A THROUGH STATION
- ↳ THE FLUGHAFEN/MESSE (AIRPORT/TRADE FAIR) STATION
- ↳ THE MITTNACHTSTRASSE S-BAHN STATION AND
- ↳ THE HOLDING SIDINGS AT UNTERTÜRKHEIM.



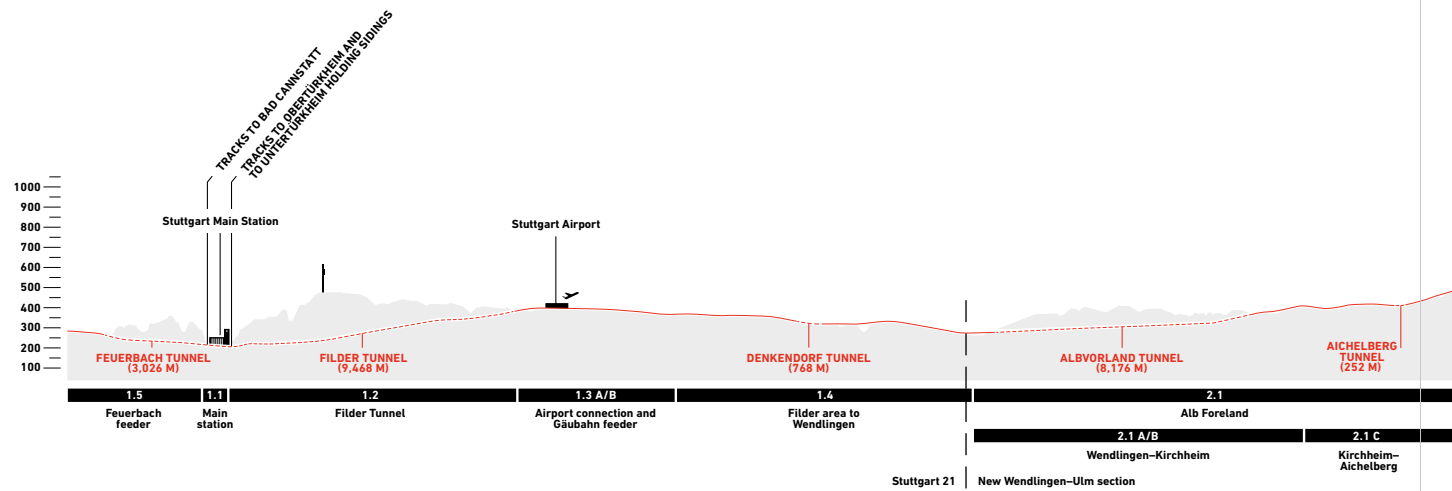
To support Stuttgart 21, Stuttgart-Vaihingen station is being extended into a regional train station.

THE NEW  
MAIN STATION  
AS THE CENTREPIECE

The new Stuttgart Main Station is the centre-piece of the project. The terminus station will be converted into a through station. It will lie at right angles to the present tracks at a depth of about 11 metres. Around 50 points will link the station's eight platform tracks and eight through tracks. The new station has been designed to accommodate the doubling of passenger numbers compared to 2010. The envisaged "Deutschlandtakt" synchronized timetable will only be made possible thanks to trains being able to arrive and depart more quickly at the new station. The Stuttgart hub will be Germany's first digitally controlled hub. It will improve the rail service's performance and punctuality. The above-ground tracks will be removed when the new station is complete. The freed-up land will be turned into a new urban district: the Rosenstein Quarter.







**FLOWING  
RAILWAY TRAFFIC**

The through station will have half as many platform tracks as the old terminus station. And yet, it will be able to handle more trains with fewer delays.

- THERE ARE THREE KEY REASONS FOR THIS:
- ↳ Trains entering and leaving the station will no longer get in each other's way.
  - ↳ The number of incoming/outgoing tracks for long-distance and regional trains will rise from five to eight.
  - ↳ In future, trains will be able to arrive and depart at 60 to 100 kilometres per hour. The present speed limit is 30 to 40 kilometres per hour.

A predominately underground railway ring will connect the new station to the existing network. New holding sidings will be built on railway premises in Untertürkheim.



**S-BAHN: THE NEW  
MITTNACHTSTRASSE  
STATION**

The S-Bahn will also benefit from Stuttgart 21. Currently, it has to share the tracks with regional trains. In future, these lines will be used exclusively by S-Bahn trains. Furthermore, the new Mitternachtstrasse S-Bahn station will serve the Rosenstein Quarter. It will also enable faster transfers between Feuerbach and Bad Cannstatt.

**FLUGHAFEN/MESSE  
(AIRPORT/TRADE FAIR) STATION:  
THE NEW TRAFFIC HUB**

A new station for long-distance and regional trains is being built between Stuttgart Airport and the trade fair centre. Journey times from there to the main station in the city centre will be reduced from 27 to 8 minutes. In future, it will also be possible to reach most regions of Baden-Württemberg from the airport station without the need to change trains.

- THIS WILL BENEFIT
- ↳ ten million airline passengers per year,
  - ↳ more than a million trade fair visitors per year and
  - ↳ a quarter of a million people in the catchment area of the new station.

With the long-distance bus station and a light rail connection, a traffic hub will be created between rail, road and airspace.



**NEW WENDLINGEN-  
ULM SECTION:  
REDUCED JOURNEY  
TIMES, MORE  
CAPACITY**

THE RAILWAY CROSSES THE RIVER NECKAR AT WENDLINGEN. THIS IS WHERE THE NEW 60 KILOMETRE-LONG SECTION TO ULM BEGINS.

It connects directly to the high-speed line from Stuttgart to Wendlingen which is being constructed as part of Stuttgart 21. Most of the route to Ulm runs parallel to the A8 motorway. Where this is not possible, the route passes through five long tunnels.

At around 85 metres, one of the highest railway bridges in Germany is also being constructed in the Filstal valley at Mühlhausen. Currently, trains have to decelerate



Filstal Bridge  
at Mühlhausen

to 70 kilometres per hour on some sections of the old line in order to cross the Swabian Jura. In contrast, they will be able to travel at speeds of up to 250 kilometres per hour on the new line.

At present, the ICE from Stuttgart to Ulm takes approximately an hour. In future, this will be roughly halved. Journey times for regional trains will also be reduced from 60 to around 41 minutes. This includes stops at the airport and the new station in Merklings. The new line will relieve the existing railway line. Capacity will be freed up for regional trains and goods traffic.





THE BONATZ BUILDING – WITH ITS  
LARGE ENTRANCE HALL AND TOWER –  
WILL BE PRESERVED.

THE EXISTING TRAIN STATION BUILDING  
WAS CONSTRUCTED BETWEEN 1914 AND  
1928 AND IS NAMED AFTER ITS ARCHI-  
TECT, PAUL BONATZ.

## BONATZ BUILDING



# THE NEW MAIN STATION

THE CENTREPIECE OF THE PROJECT



THE NEW  
MAIN STATION

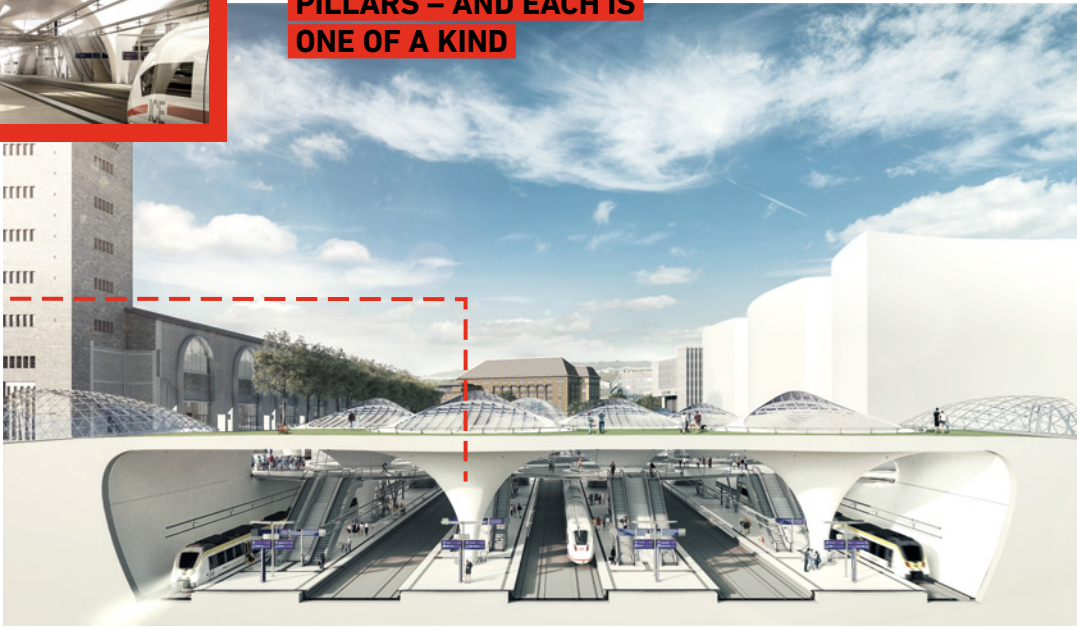
THE NEW STUTTGART MAIN STATION WILL LIE AT RIGHT ANGLES TO THE PRESENT TRACKS AT A DEPTH OF ABOUT 11 METRES. IT WILL HAVE EIGHT TRACKS WITH FOUR CENTRAL PLATFORMS, EACH OF WHICH WILL BE 420 METRES LONG.

The interior of the Bonatz Building will be modernised and will feature a new platform hall. Its roof will be accessible to pedestrians and will form the new Manfred-Rommel-Platz square. This will be immediately connected to the Mittlerer Schlossgarten park and will create a direct route between the city centre and the new Rosenstein Quarter.

Cross section  
of the future  
platforms



28 CHALICE-SHAPED  
PILLARS – AND EACH IS  
ONE OF A KIND



OVERALL HEIGHT OF A PILLAR	UP TO 12 M
HEIGHT OF A PILLAR BASE	6 M
DIAMETER OF EACH PILLAR	32 M
FORMWORK AREA	APPROX. 1,000 M <sup>2</sup>



THE CHALICE-SHAPED  
PILLAR IS GROWING

## SHORT AND FULLY ACCESSIBLE ROUTES

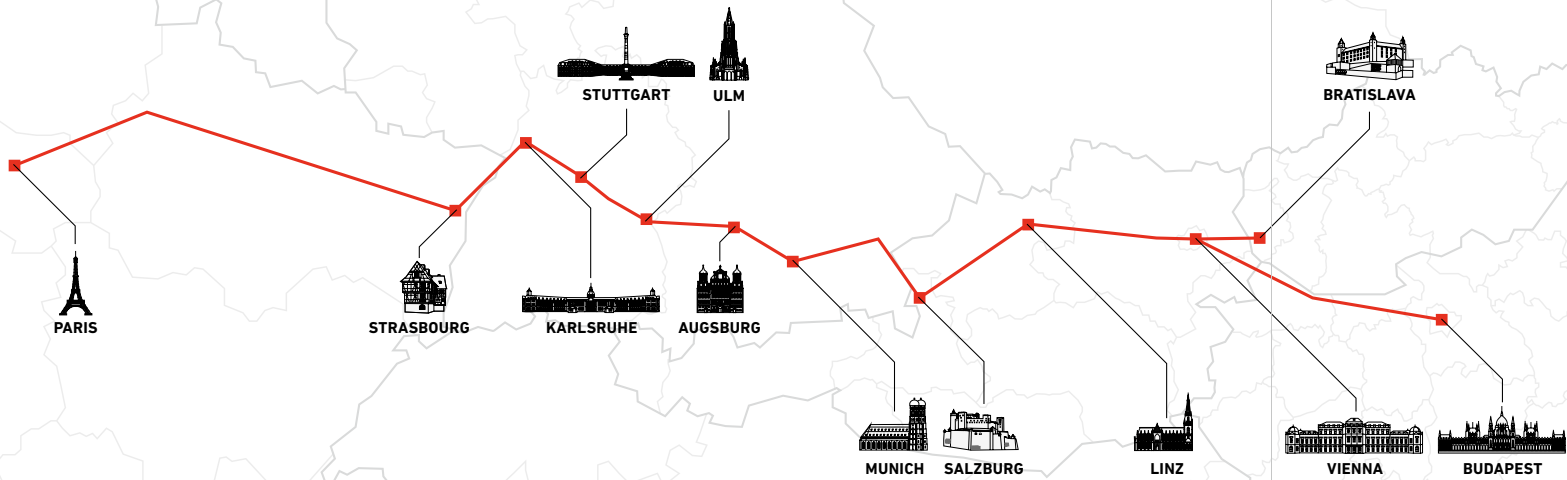
Passengers will be able to access their trains more easily. The new Stuttgart Main Station will be reachable via short and fully accessible routes from all directions. The three distribution walkways running over the platforms will be accessible from ground level. Three lifts, five flights of stairs and seven escalators will lead to each platform. The walkways will make it quicker to change platforms. Each platform will also provide direct access to the S-Bahn. The shortest distance (from platform 1/2) to the Hauptbahnhof (tief) S-Bahn station will be just 50 metres.

## A JEWEL OF ARCHITECTURE AND ECOLOGICALLY SOUND

Christoph Ingenhoven is the architect behind the new main station. His design integrates the Bonatz Building into the new modern architecture. The hallmark of the new station will be 28 chalice-

shaped pillars. These will form a unique concrete formwork construction of a type never built before. The pillars will set new standards in the combination of structural engineering and design. Narrow at their base, they will widen as they extend upwards. Together, they will connect to form the hall's roof. The three-dimensional curved surfaces of these unique structures will be reminiscent of a chalice. The formwork of each chalice-shaped pillar will cover an area of over 1,000 square metres. Each completed pillar will contain 350 tonnes of reinforcement steel distributed across up to 33,000 individually measured steel struts. The chalice-shaped pillars will play a second role in addition to their load-bearing function. 27 of the 28 have large, round "light eyes" measuring 200 m<sup>2</sup> sitting on top of them, which allow daylight to reach the platforms. As a result, scarcely any artificial light will be required during the daytime, which will save energy. The temperature inside the platform hall will remain at a comfortable level all year round, with incoming trains and the cooling air flowing in from the tunnel ensuring the required amount of air exchange. The earth above the platform hall will emit heat and cooling energy gradually and will have an insulating effect.

Main Line  
for  
Europe



# FAST AND DIRECT TRAVEL

## EUROPE'S CITIES MOVE CLOSER TOGETHER

The new Stuttgart–Ulm axis is part of the “Main Line for Europe”. The name refers to a network of railway lines for high-speed trains. It connects regions and major cities across five European countries. 34 million residents and 16 million workers live in these areas. The project originated with an initiative of the European Union (EU).

Stuttgart and Ulm are situated near the centre of this important route. The 1,500 kilometre-long stretch links Paris, Strasbourg, Munich and Vienna with Bratislava and Budapest. The line is the central west-east connection of the European railway network. Its expansion is contributing to the economic, political and cultural convergence between Western and Eastern Europe.

## BADEN-WÜRTTEMBERG: IMPROVED PUBLIC TRANSPORT

THE STUTTGART–ULM RAIL PROJECT WILL  
IMPROVE RAILWAY TRAFFIC IN  
BADEN-WÜRTTEMBERG AS A WHOLE:

Many connections will become faster and more direct. Eight million of the total eleven million residents will benefit from the rail project. Because they live in rural districts which can be accessed by new, fully connected regional train lines, for example. The Stuttgart–Ulm Rail Project means more trains can run. Journey times will be shorter and there will be new direct connections. Furthermore, the possibilities for changing trains will be improved. The overall quality of travel will be enhanced.

Thanks to faster connections, regions are growing closer together. In future, living in Ulm and working in Stuttgart will be no problem. This also applies to other regions in the state. Companies will also benefit, as they will more readily attract skilled workers if they are quick and easy to reach.

## THE STUTTGART REGION: FASTER AND BETTER TRAVEL

The existing terminus station will be converted into a through station. The trains then no longer have to change direction when they leave the station, but can instead simply continue their journey. In this way, it will be possible to link together traffic lines which currently terminate at the main station. Where passengers presently have to change trains, in future they will be able to simply remain seated. This will not only save time, but will also make travelling by train more pleasant.

THE RAIL PROJECT WILL ALLOW MANY CITIES  
TO BE REACHED MORE QUICKLY.  
THIS WILL STRENGTHEN THE ECONOMY AND  
ENHANCE QUALITY OF LIFE.





85

85 hectares  
of space for a new  
urban district



# THE NEW ROSENSTEIN QUARTER

STUTTGART 

MORE INFORMATION  
FROM THE CITY  
OF STUTTGART

WWW.ROSENSTEIN-  
STUTTGART.DE

The completion of the through station is offering the state capital of Stuttgart a unique opportunity. 85 hectares of land are being cleared. And plans are in place to transform the space into a new urban district, which will be known as the Rosenstein Quarter.

Including at least 20 hectares of new green space, the Rosenstein Quarter will connect the Nordbahnhofviertel district, Rosenstein Park and the Schlossgarten park. Its five exemplary city districts will provide affordable housing and will encompass everything people need for modern living and working. With its pioneering solutions, the Rosenstein Quarter will be a sustainable and climate-neutral environment in which people can live, work and reside.

## WHAT STRUCTURE AND FORM SHOULD THE ROSENSTEIN QUARTER TAKE?

The City of Stuttgart began by asking its citizens about their wishes, ideas and concerns. This large-scale civic participation project went on to form the basis for an international urban development competition, which was eventually won by the asp Architekten GmbH/Koeber Landschaftsarchitektur GmbH working group. Together with the architects, the City of Stuttgart is now developing a framework plan. This is a more detailed version of the plan proposed during the competition and marks a significant intermediate step in the development of the Rosenstein Quarter.

## A VISION OF MODERN URBAN DEVELOPMENT

The architects from asp/Koeber describe their plan as "radically green". The Rosenstein Quarter districts will stand out for their green inner courtyards, short distances and mixed-use design. The intention is for them to consume no more energy than they produce. A square will be at the heart of each neighbourhood and will serve as an important focal point of community life. So-called "district hubs" will turn the Rosenstein Quarter into a centre for modern forms of mobility by offering

rental stations for cars, bikes and e-bikes. Shops, cafés and social facilities like nurseries can move into the ground floors of these hubs. The hubs will also supply each district with everything it needs logistically. Goods will reach people over short distances, while excellent footpath and cycle track connections will help pedestrians and cyclists to get around quickly and easily. Cycle highways will make it especially easy for cyclists to reach their destinations quickly. Public transport will also play a significant role. Every resident or visitor will be able to find a bus stop or train station within a radius of around 200 metres.

Crossing all social strata – from families and single people to shared living communities and senior citizens – everyone can live together in harmony in the Rosenstein Quarter. Different generations will come together and actively participate in the community. Youth and multi-generation centres as well as places of culture and learning become meeting points. Urban gardening connects people who use free areas and roofs to grow plants together. The large parks in the Rosenstein Quarter will connect the individual districts and serve as social meeting points. Housing in the Rosenstein Quarter will be affordable for all. This will be made possible by suitable rental and ownership models such as joint building ventures or building cooperatives.

THE MOTTO OF THE NEW ROSENSTEIN QUARTER IS "FOR EVERYONE. FOR THE FUTURE."

Greened façades will be a distinctive feature of the courtyards in the new residential district.



The Rosenstein Quarter has been designed to be a climate-neutral – or even energy-positive – urban district. The conditions for this to happen are in place.



  
ROSENSTEIN  
QUARTER FILM



ATTRACTIVE RAILWAY TRAVEL

BWEGT – PUBLIC TRANSPORT  
FOR THE FUTURE



Baden-Württemberg

MORE INFORMATION FROM THE  
STATE OF BADEN-WÜRTTEMBERG

WWW.BWEGT.DE

A BETTER SCHEDULE  
WILL MAKE TRAIN TRAVEL  
MORE ATTRACTIVE

By 2030, the aim is for twice as many people to travel on regional trains than in 2010. To help make this target a reality, the rail service needs to keep improving. A number of important changes will be introduced by this date. Trains across Baden-Württemberg will stop at stations at least once an hour between 5:00am and midnight. Express trains will connect the large cities and rural regions. Train stations will be modernised and made fully accessible. This will lead to fewer cars in towns and cities, reduce congestion and help the climate by decreasing exhaust emissions. Each passenger kilometre travelled by car produces 139 grams of harmful CO<sub>2</sub> emissions, while each passenger kilometre travelled by train results in just 60 grams.

ELECTRIC TRAINS EMITTING  
FEWER AND FEWER POLLUTANTS

Sixty percent of the rail network in Baden-Württemberg is equipped with power lines. The state

government's long-term objective is for all trains to be powered by electricity. But this will take time. Electrifying a railway line requires new pylons to be constructed and new power lines to be laid. And often the line needs to be completely modernised. New diesel trains have already been put into operation to help reduce the amount of pollutants produced by rail travel more quickly. These trains consume less fuel and, unlike older trains, do not produce dark clouds of exhaust gases when pulling away from the station.

OTHER ALTERNATIVES ALSO EXIST. IN EARLY 2019, THE FIRST TRAIN WITH A FUEL CELL PROPULSION SYSTEM IN BADEN-WÜRTTEMBERG WAS TAKEN FOR A TEST DRIVE.

It is powered by the gas hydrogen, which a fuel cell converts into electricity during the journey. Another option is a hybrid engine, which uses both electricity and diesel. On average, hybrid trains use 25 percent less diesel. This means that they emit fewer harmful exhaust gases. Plans are in place for alternative propulsion systems to be used on services such as the Ortenau S-Bahn from 2023.

WHO IS RESPONSIBLE  
FOR LOCAL RAILWAY  
SERVICES?

The State of Baden-Württemberg is responsible for local public transport. Up until 2016, Deutsche Bahn (DB Regio) ran almost 70 percent of all local railway services in Baden-Württemberg.

Since then, new contracts and calls for tender have resulted in more competition on the railway.

BADEN-WÜRTTEMBERG ISSUES EUROPE-WIDE INVITATIONS TO TENDER FOR INDIVIDUAL LINES. ANY RAILWAY COMPANY CAN APPLY.

The chosen company concludes a contract with Baden-Württemberg.

NEW BLACK  
AND YELLOW TRAINS

Many of the new trains running across Baden-Württemberg are painted in the state's colours of black and yellow. The railway companies select the train manufacturers themselves by issuing their own Europe-wide invitations to tender. One of the conditions set by Baden-Württemberg is that the new trains must provide a better service than before. Examples of improvements include Wi-Fi, air conditioning and at-seat power outlets as well as more space for wheelchairs and bicycles. If the railway companies are in agreement, the Landesanstalt für Schienenfahrzeuge (Regional Office for Railway Vehicles – SFBW) in Stuttgart can purchase these trains on favourable terms. The companies can pay to lease these trains from Baden-Württemberg, but the trains still belong to the state. The trains are recognisable by the colours white, yellow and black and the "bwegt" logo. This process has increased competition for the benefit of passengers. By the end of 2022, more than 250 of these new trains will be running on local railway services.



# EFFICIENT S-BAHN SERVICE FOR THE REGION



MORE INFORMATION FROM THE  
VERBAND REGION STUTTGART  
[WWW.REGION-STUTTGART.ORG](http://WWW.REGION-STUTTGART.ORG)

## THE S-BAHN IS THE BACKBONE OF PUBLIC TRANSPORT IN THE REGION

The Verband Region Stuttgart (VRS) has been responsible for the S-Bahn since 1996. S-Bahn trains serve more than 80 stations along seven lines daily. Every day, they bring over 430,000 passengers comfortably to their destinations in an environmentally friendly manner.

## PEOPLE MOVE AROUND DIFFERENTLY TO HOW THEY DID JUST A FEW YEARS AGO

Working people want to better combine their family and professional life. Working hours are becoming more flexible. This means that an increasing number of people rely on frequent services, even outside of peak times. Commuters expect numerous opportunities to change trains.

FOR THIS REASON, THE VRS IS EXPANDING THE S-BAHN NETWORK AND INCREASING THE FREQUENCY OF TRAINS.

Since the end of 2020, trains on almost all lines have been running at 15-minute intervals from Monday to Friday. In 2019, the VRS decided to invest well over 400 million euros in purchasing 58 additional trains. This will make the S-Bahn service fit for the future. A modern digital train control system (ETCS) will be used to ensure more capacity and fewer delays. As part of the "Stuttgart digital hub" pilot project, this technology is set to be installed in the Stuttgart rail hub. ETCS will enable more trains to travel at more frequent intervals, transporting more passengers safely and comfortably to their destinations. The new technology will also allow some S-Bahn services which currently end at Schwabstrasse to continue to Vaihingen and then Böblingen.

## THE NETWORK IS RUNNING MORE FREQUENT AND BETTER SERVICES

Stuttgart 21 will also significantly improve the regional transport service. This will partly be



made possible by the regional train lines being fully connected by the new main station. These lines will create a transport system with numerous new direct connections, shorter journey times and better connecting trains. The airport will connect with long-distance and regional trains and will be transformed into a new transport hub. The S-Bahn trunk route will also be extended. At Mittnachtstrasse, there will be a new S-Bahn station between the main station and Bad Cannstatt. Trains on all lines will stop at Mittnachtstrasse. Passengers changing trains who are, for example, travelling northwards from the Rems valley and the Neckar valley or vice versa will enjoy much shorter journey times in the future. The S-Bahn network will also grow outwards. Extensions to Neuhausen auf den Fildern and Nürtingen have already been agreed and planning is underway.

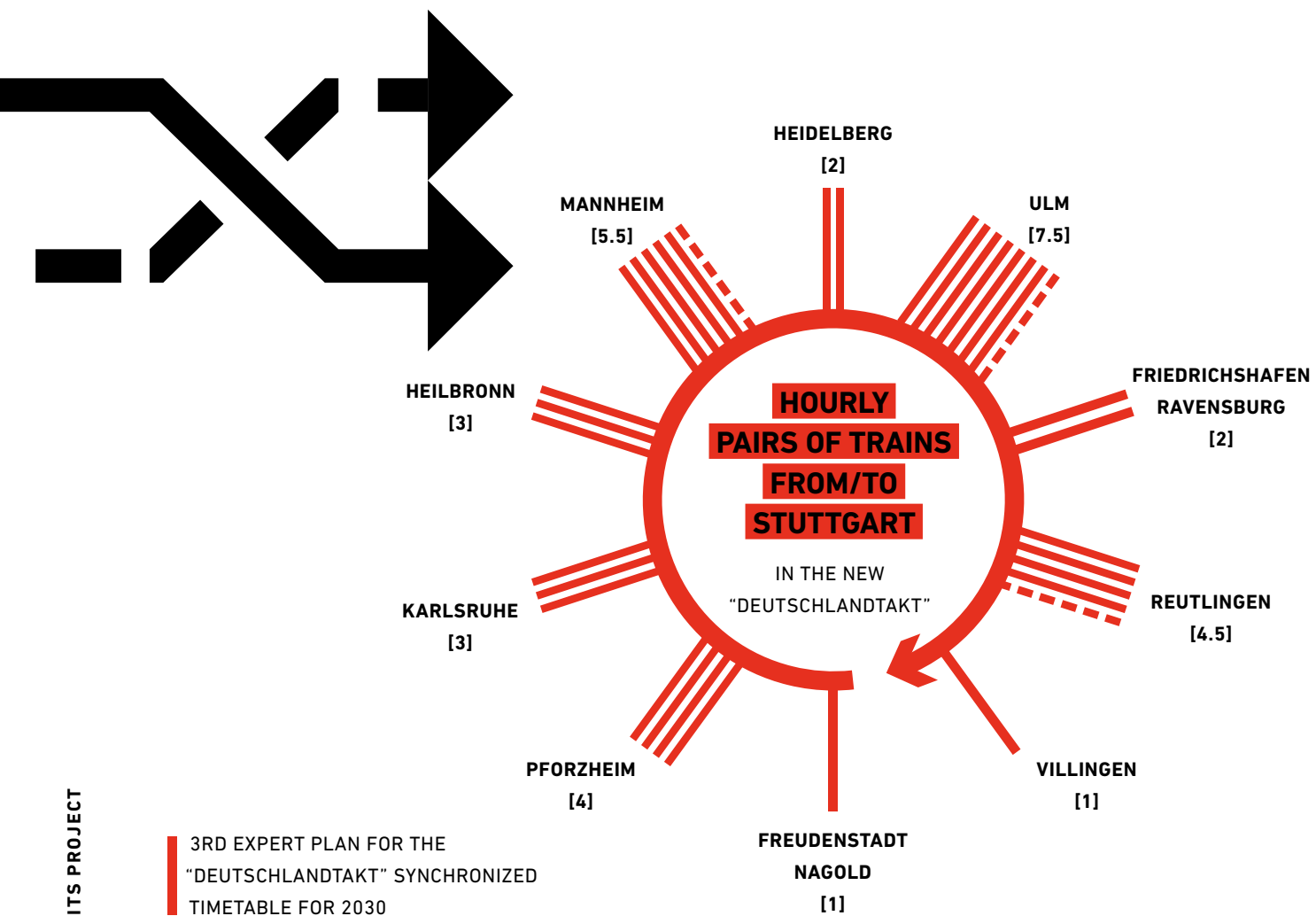
## GREATER COMFORT

From 2021, all S-Bahn trains in the region will gradually be given a fresh lick of paint, a modernised interior and new technology to make them fit for the future. Instead of their classic red colour, the trains will be painted in a radiant light grey. Eye-catching colours will be used for the doors and special compartments to make the trains easier and quicker to board at stations. New additional multi-purpose compartments will make travel easier for wheelchair users and passengers with bikes or pushchairs. The trains will be equipped with power outlets and new, larger screens will keep passengers informed about the train's current location and travel time. Free Wi-Fi has been available on board since mid-2017. What's more, passengers can now use the new train portal to access all travel information in real time on their mobile, tablet or laptop.



# DEUTSCH- LANDTAKT AND DIGITAL HUB

A SYNCHRONIZED  
TIMETABLE  
FOR THE ENTIRE  
COUNTRY AND  
NEW DIGITAL  
TECHNOLOGY.



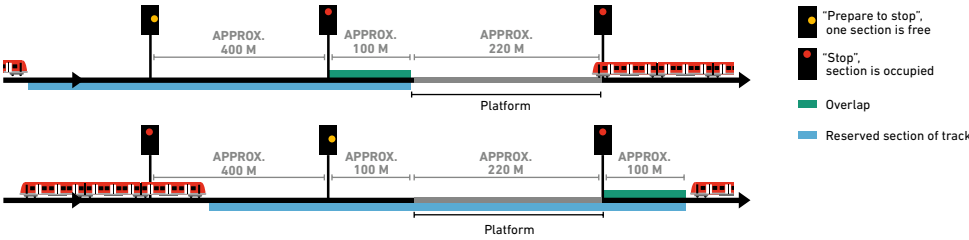
3RD EXPERT PLAN FOR THE  
"DEUTSCHLANDTAKT" SYNCHRONIZED  
TIMETABLE FOR 2030

ITS PROJECT

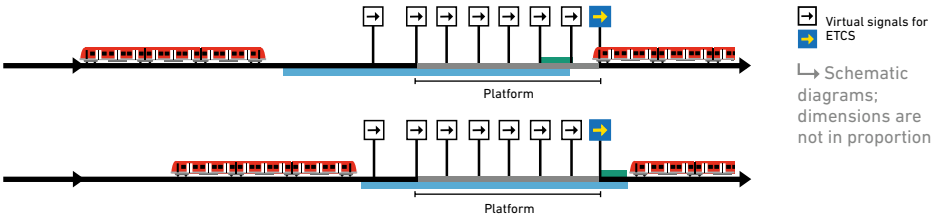
THE STUTTGART  
RAIL HUB WILL BE  
THE FIRST IN  
GERMANY TO BE  
UPGRADED BY  
DEUTSCHE BAHN.



FLOW OF RAIL TRAFFIC WITH CONVENTIONAL CONTROL AND SAFETY TECHNOLOGY



FLOW OF RAIL TRAFFIC WITH ETCS



## THE NEW "DEUTSCHLANDTAKT" SYNCHRONIZED TIMETABLE

FROM 2030, THE AIM IS FOR TWICE AS MANY  
PEOPLE TO TRAVEL BY RAIL THAN IN 2010.  
ONE STEP TOWARDS THIS IS A SYNCHRONIZED  
TIMETABLE FOR THE ENTIRE COUNTRY KNOWN  
AS THE "DEUTSCHLANDTAKT".

Lots of trains from different lines will travel  
through stations with important hub functions.  
Trains will arrive at regular times, making the time-  
table easy to remember. For example, a half-hour  
interval for long-distance services is envisaged on  
the busy Mannheim–Stuttgart–Ulm line.

The aim of the "Deutschlandtakt" is to efficiently  
coordinate long-distance and regional trains.  
Because it applies to the whole of Germany, its  
scope extends well beyond the implementation  
of Stuttgart 21. The planned "Deutschlandtakt" is,  
however, reliant on Stuttgart 21. The current plans  
for the "Deutschlandtakt" synchronized timetable  
envisage a basic offering of 33 long-distance and  
regional trains per hour for the future Stuttgart  
Main Station. This is more than ever before and is  
a third more than at present (November 2020). The  
planned schedule would be impossible without  
Stuttgart 21.

The new rail hub creates the conditions for the  
politically driven aspiration to double passenger  
numbers.

## STUTTGART DIGITAL HUB

The familiar signalling equipment along the tracks  
will be replaced by digital technology to optimise  
train travel. This will speed up processes while  
ensuring utmost safety. More trains will be able to  
transport more passengers to their destinations  
more quickly and at shorter intervals. Stuttgart 21  
and the S-Bahn network will be the pioneers of this  
transformation, as, by 2025, the Stuttgart rail hub  
will become the first in Germany to be upgraded by  
Deutsche Bahn. The new through station is just  
part of the Stuttgart hub. The hub also includes all  
the stations and lines in the surrounding area.  
By 2030, the new systems will have been installed  
across the region, including on the S-Bahn  
network. Digital technology will be used to improve  
travel for more than half a million passengers  
every day.

A KEY PART OF THE DIGITAL TECHNOLOGY IS  
THE EUROPEAN TRAIN CONTROL SYSTEM (ETCS).

The ETCS train control system monitors a train's  
journey and uses "stop" signals to prevent it from  
continuing along the track. To do so, the ETCS  
gathers information from tracks, trains and signal  
boxes. Computers process the data and convert the  
results into instructions. ETCS is used or scheduled  
to be used in over 60 countries worldwide. In com-  
bination with other systems, it will help to increase  
the number of trains while improving punctuality.





# SUSTAIN- ABILITY

## LESS NOISE

In future, residents of the Stuttgart Basin will hear almost no noise from passing trains. This is because the layers of soil above the railway tunnels act as a natural silencer.

The weight of even the quietest trains sends vibrations through the surrounding area. Where necessary, routes are fitted with suitable vibration-absorbing technology. So-called mass-spring systems or sub-ballast mats can be used, for example. Trains travelling at high

speed through a long tunnel can produce a loud bang when exiting the tunnel. This bang is created by the air pocket which is compressed by the fast-moving train. When the train leaves the tunnel, the pocket expands suddenly just like when a balloon bursts. To prevent this, tunnels like the Filder Tunnel are designed with a special portal. When a train enters the tube, the pressure wave is automatically dissipated. No bang can be heard – not even at 250 kilometres per hour.

## BETTER AIR

THE STUTTGART-ULM RAIL PROJECT WILL MAKE RAILWAY TRAVEL FASTER AND MORE ATTRACTIVE.

It will shift millions of passenger trips from road to rail. This is what surveys show. The new line will also take the strain off the existing rail network. Goods traffic will also benefit – in future, more goods will pass through the Filstal valley by rail instead of by road. Trains are more environmentally friendly than any other form of transport. For years, Deutsche Bahn has been considerably increasing the proportion of green electricity in the mix of energy consumed by its railways. The rail project will result in more trees, shrubs and meadows, which in turn will improve air quality.



## 20 HECTARES OF ADDITIONAL GREEN SPACE

Stuttgart 21 will lead to more green space. The Schlossgarten park can be extended and additional green spaces will be created. Where there were once tracks, trees, shrubs and meadows will cover 20 hectares of land. This is an area as large as 30 football pitches. The rail project will also make it easier to protect the landscape. Green spaces on the outskirts of the city will be preserved. In many places, the new line will run directly alongside the motorway so that the landscape does not have to be cut in two again. This means that the road and railway will be confined to one place. What's more, the numerous tunnel sections will prevent the landscape from being distorted by above-ground tracks.

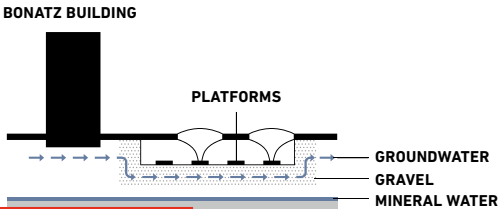
## LOWER ENERGY REQUIREMENTS

The new Stuttgart through station does not need any artificial heating and hardly any artificial light during the day. The new Rosenstein Quarter is designed to be climate-neutral. It should produce more energy than it consumes.



## PROTECTION OF ANIMALS AND PLANTS

Environmental and species protection is an important issue for the Stuttgart-Ulm Rail Project. Deutsche Bahn has arranged for a large number of trees to be planted and for land to be converted into new forests. It has also created new habitats for endangered species, such as bats, lizards and hermit beetles.



## PROTECTION OF MINERAL WATER

During the construction of the main station, every effort is being made to protect Stuttgart's valuable mineral springs. This is made possible by comprehensive groundwater management. A system of pumps, pipes, treatment facilities, filters and monitoring wells regulates the groundwater level. The excavation must stay dry at all times. To this end, groundwater and rainwater are drained, cleaned and then returned to the surrounding soil. This method keeps pressure conditions in the soil constant, which prevents any rising and potential contamination of the mineral water. The valuable springs remain unaffected by the construction. The floor slab of the station is around 30 metres above the layers which carry the mineral water.

SUSTAINABLE  
FOR  
PEOPLE & THE ENVIRONMENT



CONSTRUCTION PROCESS  
AND  
CONSTRUCTION LOGISTICS



TUNNELLING

GEOLOGY AS THE KEY FACTOR

The method used to build a tunnel depends on various factors. The type of rock and the distance between the tunnel and the ground surface determine what technology is used. Furthermore, the geology dictates which machines the engineers will use. A tunnel can be constructed using either the cut-and-cover or the boring method.

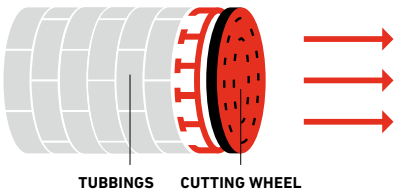
↳ CUT-AND-COVER METHOD:  
The tunnel is constructed in a trench. This method is used when a tunnel lies just beneath the surface. An example of this is the Widderstall Tunnel near Merklingen.

↳ BORING METHOD:  
The tunnel boring method involves cutting the tunnel into the mountain without having to excavate a trench. Most of the tunnels in this rail project are being constructed in this way. Two methods are differentiated: the sprayed concrete method and the driving method including the use of tunnel boring machines.

SPRAYED CONCRETE METHOD:  
LOOSENING, LOADING, CONCRETING

This work requires specialist tunnellers, who start by excavating rock and stone out of the mountain mass metre by metre. To do so, they work on the loose rock using excavators with pneumatic chisels. The tunnellers blast the solid rock to loosen it. Dumper trucks then bring the excavated material into the open. The cavity created is secured using arches, steel mats and a sprayed concrete lining. This produces the upper part of the tube in the form of a semi-circle, known as the crown. The lower half of the tube – known as bench and invert – is then excavated. This part will later on carry the foundation and the rail bed. Long stretches of sturdy plastic protect the tunnel walls against ground and mountain water. Lastly, the inner lining is concreted using a formwork carriage. At this point, the shell of the tunnel is complete.

DRIVING WITH MACHINES:  
THE TUNNEL GROWS RING BY RING



Huge boring machines are suitable when tunnels run through uniform geological strata. The use of these powerful tools is particularly worthwhile with long tunnels. In this project, these are the Filder Tunnel, the Bossler Tunnel and the Albvorland Tunnel. The rotating cutting wheel of the tunnel boring machine breaks the rock, which is then removed through the machine into the open air. After a set distance, the machine is stopped and the exposed cavity is lined with pre-fabricated concrete parts called tubbings. Seven of these tubbings form a ring. Any voids remaining between the tubbings and the surrounding mountain are grouted. Then construction continues with the next section. In this way, the tunnel grows ring by ring.

RAILWAY TECHNOLOGY  
AND SUPERSTRUCTURE

INTERIOR CONSTRUCTION:  
THE TUNNEL IS PREPARED FOR RAIL TRAFFIC  
When the shell is complete, railway technology is installed in the tunnel. This takes approximately two years. This railway engineering equipment includes:

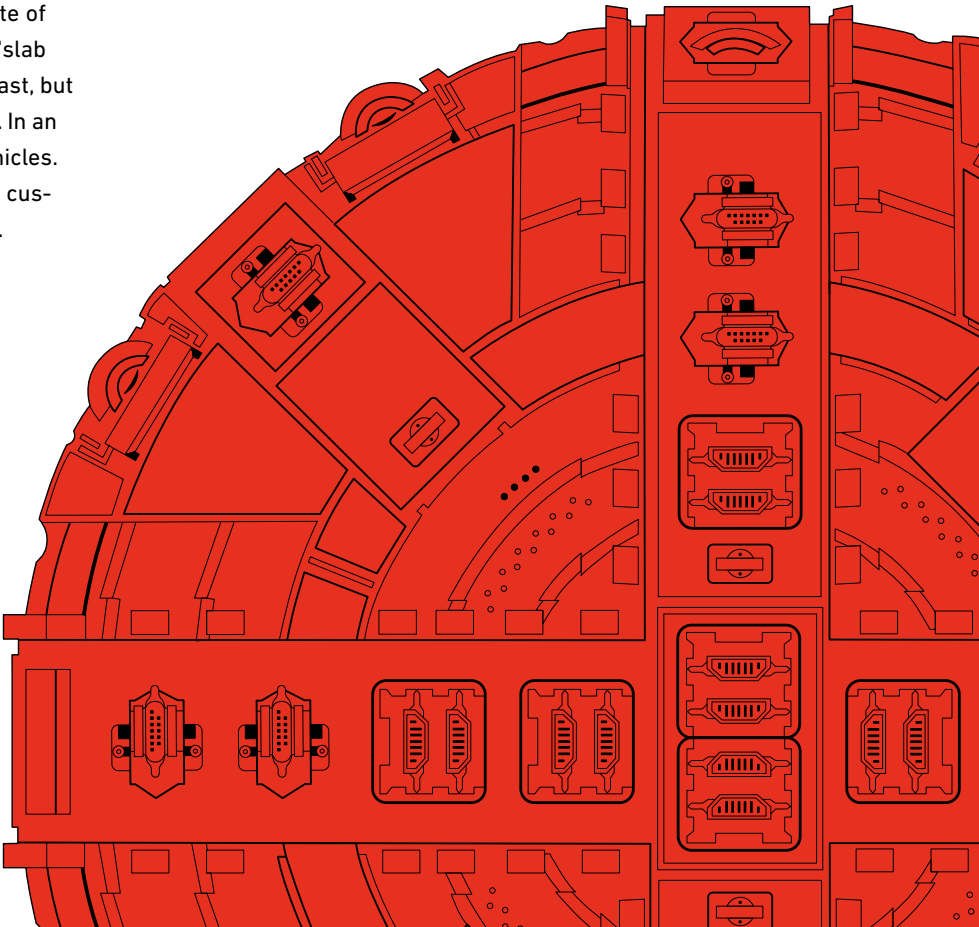
- ↳ tracks and points
- ↳ overhead contact line
- ↳ signalling technology
- ↳ telecommunications technology
- ↳ safety technology

SLAB TRACK:  
A CONCRETE TRACK BED  
The tracks in the tunnels of the Stuttgart–Ulm Rail Project will mostly be laid on a substrate of reinforced concrete. This is referred to as a “slab track”. The track bed does not consist of ballast, but of solid elements such as concrete or tarmac. In an emergency, it can be driven on by rescue vehicles. In Germany, this construction method is now customary for routes used by high-speed trains.

CONSTRUCTION  
LOGISTICS

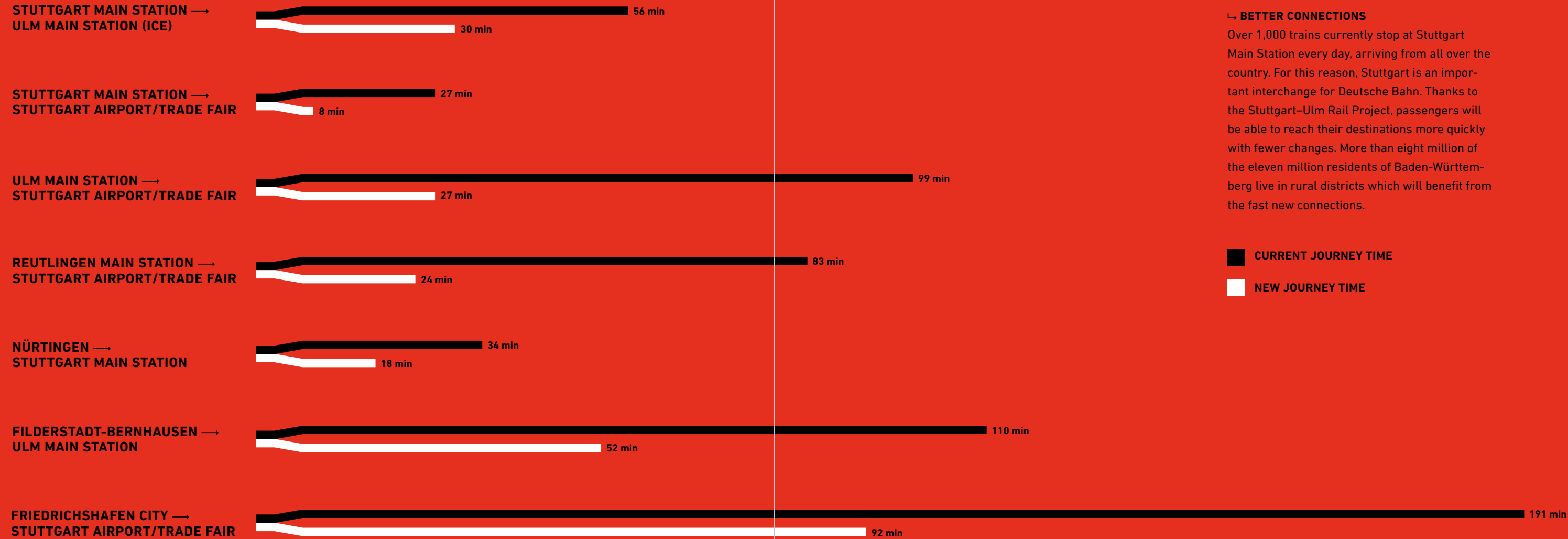
40 million tonnes of excavated material. This is how much soil and rock is being moved for the Stuttgart–Ulm Rail Project. Along the new Wendlingen–Ulm section, the construction firms are disposing of the excavated material themselves. In the case of the Stuttgart 21 sub-project, this only applies to just over half of the material. Here, trains are transporting the rest away from a central collection point at the Nordbahnhof station. A single train substitutes for around 40 lorry journeys. At the disposal points, the material is either stored or further processed.

In Stuttgart, lorries bring soil to the collection point on specially created construction roads. In this way, construction vehicles place no additional strain on public roads and traffic is not hindered.



Cutting wheel  
of a tunnel  
boring machine





**FAST AND COMFORTABLE TRAVEL**

↳ **BETTER CONNECTIONS**  
Over 1,000 trains currently stop at Stuttgart Main Station every day, arriving from all over the country. For this reason, Stuttgart is an important interchange for Deutsche Bahn. Thanks to the Stuttgart–Ulm Rail Project, passengers will be able to reach their destinations more quickly with fewer changes. More than eight million of the eleven million residents of Baden-Württemberg live in rural districts which will benefit from the fast new connections.

■ CURRENT JOURNEY TIME  
■ NEW JOURNEY TIME

ARRIVE  
SHORTER  
travel times  
MORE  
QUICKLY



# SHORT & SWEET

The light eyes will allow daylight to reach the platforms at the new Stuttgart Main Station.

**27**  
LIGHT EYES



**85**  
HECTARES FOR THE ROSENSTEIN QUARTER

The new urban district is designed to be sustainable and climate-neutral.



**20**  
HECTARES FOR MORE GREEN SPACE

At least 20 hectares are earmarked for the expansion of the existing parks and green areas.

**1**  
Six S-Bahn lines will stop at the new Mitnachtstrasse S-Bahn station.

**NEW CENTRAL INTERCHANGE STATION IN THE S-BAHN NETWORK**



**30**

The journey time between Stuttgart und Ulm will be almost halved.



MOTION RIDE

**MINUTES TRAVEL TIME**



**250**  
KM/H HIGH-SPEED LINE

Trains will travel at speeds of up to 250 kilometres per hour on the new line between Stuttgart and Ulm.



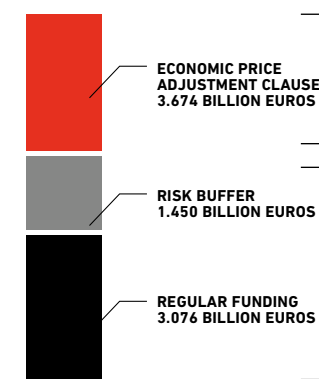
**81**  
BRIDGES

The Stuttgart-Ulm Rail Project will build 81 new bridges: 44 for Stuttgart 21 and 37 for the new Wendlingen-Ulm section.

**11.903**

**BILLION EUROS OF FINANCING FOR THE STUTTGART-ULM RAIL PROJECT**

This comprises 8.2 billion euros for Stuttgart 21 and 3.703 billion euros for the new Wendlingen-Ulm section.



In accordance with the financing agreement from 2009, the shares of financing are still to be divided

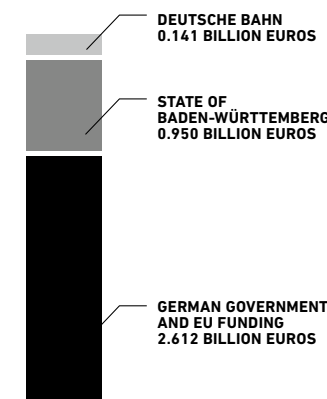
**4.526 BILLION EUROS**

The shares of financing have been agreed and are divided as follows in accordance with the financing agreement from 2009:

- ↳ Deutsche Bahn companies 1.563 billion euros
- ↳ German government and EU funding 1.413 billion euros
- ↳ State of Baden-Württemberg 0.931 billion euros
- ↳ State capital of Stuttgart 0.292 billion euros
- ↳ Stuttgart Airport 0.227 billion euros
- ↳ Verband Region Stuttgart 0.100 billion euros

## STUTTGART 21

The financing currently approved by the Supervisory Board of Deutsche Bahn AG amounts to 8.2 billion euros (according to a resolution made on 26 January 2018).



## NEW WENDLINGEN-ULM SECTION

The total financing amounts to 3.703 billion euros (figure correct as of December 2017).



## EXPERIENCE THE FUTURE IN THE NEW INFOTURMSTUTT GART

Visit the new InfoTurmStuttgart (ITS) on platform 16 at Stuttgart Main Station. Our multimedia and interactive exhibition brings the Stuttgart–Ulm Rail Project and the related future developments to life. It is spread across four floors and provides a fantastic view across the construction site.



You couldn't get any closer to the action: the InfoTurmStuttgart is located right in the heart of the construction site.

### AN EXHIBITION FOR EVERYONE

- ↳ Digital content provided via monitors, iPads and augmented reality
- ↳ Haptic models
- ↳ Specially developed games and digital applications for children
- ↳ All the exhibition content is also available in English
- ↳ Fully accessible thanks to lift access, tactile wall strips, QR codes, touchable exhibits, audible room descriptions available through a Bluetooth transmitter, plain language

### GUIDED TOURS

Our construction site and exhibition tours are led by expert guides and provide fascinating insights and interesting background information on the Stuttgart–Ulm Rail Project.

### CONFERENCES

From customer meetings and conferences to private discussions, our ITS conference room can be booked for a wide range of occasions. It offers a unique central location in a venue dedicated to topics concerning the future.

### OTHER WAYS OF FINDING OUT MORE

- ↳ Exhibition in the Wendlingen am Neckar town hall
- ↳ Information boards on the A8 motorway and at Filstal Bridge
- ↳ Events on the construction site



Digital and multimedia exhibits



### FIND OUT MORE ONLINE

The InfoTurmStuttgart also has its own website.

**ITS-PROJEKT.DE**  
**#ITSPROJEKT**

**@INFOTURMSTUTT GART**  
 

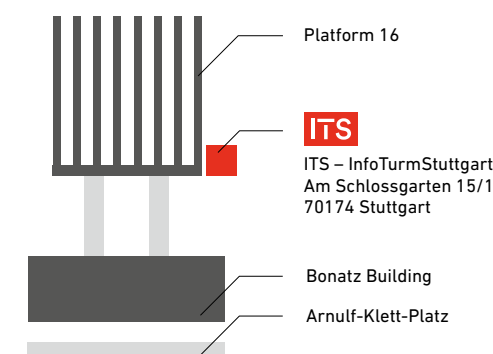
The project website provides a wide range of information on Stuttgart 21 and the new Wendlingen–Ulm section, including photos, films, 360-degree tours and webcams of the construction sites as well as detailed maps, original plans and much more.

**BAHNPROJEKT-STUTT GART-ULM.DE**

### OPENING HOURS

Monday – Friday **09:00 – 19:00**

Saturday, Sunday **09:00 – 18:00**





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