Peace and tranquillity with room for recreation

The improvement scheme for the A 7 motorway and the design of cut-and-cover tunnels will alleviate congestion, free Hamburg’s west of motorway noise – and create generous new open spaces for all ages.

Open space and tranquillity
Improvement scheme and cover for the A7
‘The A 7 motorway, currently fraught with problems, will receive a cover in this project with cross-generational significance. The vision of overcoming the “wall of noise” across Hamburg is finally taking shape.’

Prof Jörn Walter, Chief Planning Director of the Free and Hanseatic City of Hamburg
Introduction

New parks in the west of Hamburg and the opportunity to finally link neighbourhoods severed by the A 7 motorway: the improvement scheme for the A 7 motorway in Hamburg will achieve more for the city and its citizens than simply relieving the network of trunk roads.

The ‘Hamburger Deckel’ cut-and-cover tunnel project will provide ample opportunity to significantly enhance the quality of life in Schnelsen, Stellingen and Altona. At long last these cut off districts will be re-connected. The gap where the motorway corridor cuts through the urban fabric will soon be filled with three new green spaces comprising parks and allotments.

As project managers on behalf of the federal government with responsibility for urban development and landscape planning, we eagerly look forward to the start of construction works. We would like to introduce this forward-looking project, which will not only improve drivers’ experience, but also enhance the living environment and housing in our city. The following pages will provide an overview of the project, starting with the design of the ‘Hamburger Deckel’ | from page 4 |, will then focus on the tunnels’ innovative engineering | page 8 |, outline traffic projections for the A 7 | page 12 |, new residential areas | page 14 | and finally the project’s financing | page 16 |. You will also find information on the planning process and the opportunities available to you for voicing your opinion as a citizen | page 18 |.

Ministry of Urban Development and Environment and the Ministry of Economy, Transport and Innovation
Hamburger Deckel* — a great project with lots of ideas

The ‘Hamburger Deckel’ cut-and-cover project couples the long overdue improvements to the federal motorway with one of the most comprehensive noise control projects in Germany.

The three tunnels in Schnelsen, Stellingen and Altona lie at the heart of the project. Not only are they to reduce noise levels, but first and foremost they will achieve one thing: enhance the citizens’ quality of life. In only a few year’s time there will be little to remind of the typical motorway traffic queues which occur where the A 7 cuts through Hamburg’s western districts. Instead, the new areas on top of the cover are to serve Hamburg’s population with space for recreation and leisure.

Close collaboration between the city and federal government

The large-scale project is due for implementation in the next few years, to be carried out by the Hamburg Ministry of Urban Development and Environment (Behörde für Stadtentwicklung und Umwelt, BSU) and the Hamburg Ministry of Economy, Transport and Innovation (Behörde für Wirtschaft, Verkehr und Innovation, BWVI) together with the Federal Ministry of Transport, Building and Urban Affairs (Bundesministerium für Verkehr, Bau und Stadtentwicklung) and other partners, including the DEGES. Most of the work is financed by the federal government. The Free and Hanseatic City of Hamburg is contributing to the construction cost of the additional cover sections and their design.

At a glance

The anticipated date for the completion of the motorway improvement scheme and the three ‘Hamburger Deckel’ cut-and-cover tunnels in Schnelsen, Stellingen and Altona is 2022.

The tunnel roofs, measuring approximately 3,500 metres in length, will provide green and open space for citizens. This amounts to 25 hectares of new parks and allotment sites as well as generously laid out cycle routes and footpaths north of the urban railway line in the west of Hamburg.
The design inspiration for the motorway cover at Hamburg Schnelsen was Edouard Manet’s painting “Luncheon on the Grass”. The top of the cut-and-cover tunnel is to be a tranquil place with a picturesque atmosphere – the antipode to traffic noise beneath the cover."

Landscape architect Jörg Michel, competition winner of the cover section in Schnelsen.

The Schnelsen Section

From severed community to new neighbourhood

The cover in Schnelsen extends from the Heidlohestraße junction, across Frohmestraße, up to the Hamburg Schnelsen interchange. The new tunnel is to protect residents from motorway noise whilst providing them with a new park on its roof.

A jury for the Europe-wide competition chose the proposal by the Berlin-based landscape practice POLA for the 560-metre long cover. ‘Luncheon on the Grass’ is the theme for the design, a meadow bounded by a promenade to the west and allotments in the east. The allotment site extends right across the tunnel cover north of Frohmestraße. Approximately half of the three hectares of green space in Schnelsen are new allotment plots.

A new centre for the Schnelsen tunnel cover will be situated at Frohmestraße, marked by a café and spaces for events, such as markets and festivals. Previously cut off by the motorway, the neighbourhood will now be able to coalesce. And what’s more: the new centre for the reunited neighbourhood can be developed right on the tunnel cover.

The City of Hamburg will finance this additional cover segment. A three year construction period is anticipated.

*The term ‘Hamburger Deckel’ refers to three proposed noise reduction tunnels, the roofs of which are to be designed as parks.
The Stellingen Section

Quality of life outdoors:
a new park for all generations

The 893-metre long cover in Stellingen starts south of Kieler Straße and links up with a freight railway bridge in the north. The tunnel construction works are scheduled to start at the earliest in 2014. The Stellingen section marks the launch of the ‘Hamburger Deckel’ future project.

The competition jury selected Weidinger Landscape Architects’ proposal for the cover in mid-2010, and recommended it for implementation. The Berlin-based practice took particular care to integrate the different neighbourhoods in Stellingen and create a harmonious connection in a district that had been severed by the A 7 motorway. The landscape on top of the cover is structured in three sections: the southern part between Kieler Straße and Wördemanns Weg is earmarked for allotment gardens. The area north of Wördemanns Weg is to become a meadow park with lots of space for recreational activities. Further north this meadow park turns into a semi-natural tree park. A promenade runs along the whole length of the cover. To the south it follows the edge of the allotments between Kieler Straße and Wördemanns Weg, turns from west to east and ends in a tree-lined square at the northern end of the park.

The construction works are scheduled to take four years. The Stellingen section of the road construction and cover is paid for by the federal government.

The anticipated completion date for the green space on the tunnel roof in Stellingen is 2018/19. The park and recreation areas will then be ready for use.
The Altona Section

A green space from Volkspark to the River Elbe

Extending along 2,030 metres, reaching from the S-Bahn urban railway line all the way to Volkspark, the Altona section of the tunnel will be the project’s longest covered motorway segment.

The whole cover is to be used for leisure and recreation. Its special feature: the proposed open space will link into the existing park. Here too, areas previously severed and divided by the construction of the motorway in the 1970s are to be re-connected. The city can finally implement an idea which Gustav Oelsner, senator for building, had in the 1920s: a green corridor extending from Volkspark to the Elbe.

Living near Volkspark: A new urban neighbourhood comprising approximately 1,700 homes will be built in between the horse racing track and Schnackenburgallee. Most of the existing allotment gardens will be transferred on top of the tunnel cover.

In the first half of 2011 an information meeting was held in Altona. Afterwards the Hamburg Ministry of Urban Development and Environment and the Hamburg Ministry of Economy, Transport and Innovation had invited residents to put forward their ideas for the project. The outcome was included in the competition brief.

The construction period will probably last four years. The cost of the Altona cover will be shared: Hamburg will finance the additional cover sections of approximately 1,300 metres. The rest of the costs will be absorbed by the federal government.

Bridge building challenge in Langenfelde

The present alignment of the A 7 crosses Binsbarg and Rohifsweg streets on a 392-metre long bridge. The existing structure is not wide enough to accommodate eight lanes, and the bridge’s load-bearing capacity is insufficient to carry the additional weight of the road widening and noise barriers. Consequently, the bridge will be demolished and re-erected in the same place. A particular challenge facing the project is that the bridge needs to be dismantled and reconstructed while full operation of the railway is maintained. In order to ensure that motorway traffic in both directions is not hindered during the 26-month construction period, cars will be diverted to the section of the bridge that is not being worked on.

The Altona tunnel is 2,303 metres in length and the longest section of covered motorway in the project.

Competition winners for the cover section in Altona are landscape architects Arbos Freiraumplanung from Hamburg together with Petersen Pörksen Partner, architects and urban planners.
Technical highlights

Open construction
The "Hamburger Deckel" are cut-and-cover tunnels. Apart from the Elbtunnel, which was constructed as a mined cavity, the covers will be built in an open construction, i.e. with an open excavation pit. First of all, the side walls on the left and right of one carriageway are completed. Then the cover is fitted. With six to eight lanes plus slip roads, the cover will span more lanes than any other European tunnel.

A masterpiece of logistics
The proposals envisage keeping open the existing number of lanes by diverting traffic to one side of the motorway during construction works – albeit at reduced widths. Obstruction of traffic flows are to be avoided as far as possible.

Tunnel operations centre
The tunnel operations centre is the organisational hub for safety in the sequence of tunnels, starting with the Elbtunnel and progressing to the three "Hamburger Deckel" cut-and-cover tunnels. All information relevant to the operation of the tunnels, traffic management and safety monitoring is collected here. The control centre is staffed around the clock with one policeman and a technician from the Landesbetrieb Straßen, Brücken und Gewässer (Roads, Bridges and Waterbodies Agency). The fire brigade is stationed permanently at the tunnels to enable rescue operations at any time.

Escape routes and emergency stations
All three tunnels will be equipped with comprehensive safety and communication systems. Escape doors are to be fitted every 60 metres instead of the usual 300 metres. Smoke extractors are therefore not required. Accessible emergency stations will be installed between each door.

Video monitoring
Video monitoring systems will make the tunnels even safer. Traffic management in the tunnels is controlled via a system of traffic lights and gates. Over-height vehicle detection systems will prevent vehicles that exceed the height limit from driving into the tunnels.

Public address system
A modern public address system facilitates communication inside the tunnels. The police, fire brigade and paramedics will use a separate digital radio frequency.

Power supply in an emergency
In case of power failure the entire electrics in the tunnels can be switched to a backup battery system.
Mr Rothe, are tunnels the best solution currently available to prevent noise pollution? Why?
Yes. Tunnels that completely enclose a road space can reduce noise immission in the neighbouring residential areas to practically zero. The sound waves emitted by vehicles cannot penetrate solid concrete walls and soil backfill. However, tunnels are not only the most effective noise control measures, they are also by far the most expensive, due to construction and operation costs. This is why tunnels are only built if they will achieve a significant noise reduction for a large number of residential units in areas exposed to certain threshold levels. This is the case for the A 7 in Hamburg.

What other measures are proposed, apart from the cover for a section of Hamburg’s A 7 motorway, to make the environment even quieter?
Further noise control measures are proposed for the A 7, in addition to the noise reduction tunnels. These are noise barriers, up to nine metres high, along the edge of the motorway, and in places in the central reservation. Some are specially curved towards the carriageway to reduce noise more effectively. Additionally, an open pore road surface – called silent asphalt – will be used.

Altogether we are implementing the most complex and comprehensive noise control package on the A 7 in the history of motorway building in Germany.

The term ‘silent asphalt’ crops up everywhere. What exactly is it?
Silent asphalt is a porous road surface that is expensive both to produce and maintain. The voids absorb much of the noise from the tyres on the road and the vehicles’ engines.

Can daily traffic continue to flow while you are implementing the construction work?
The general constraint is to keep all of the existing lanes open. That is a big challenge for all involved, but the construction site concept will accommodate this requirement in any case. Temporary closures will be unavoidable, when bridges are demolished or while junctions are built. However, they will be kept to an absolute minimum and the dates will be published in the media in due course.

Bernd Rothe is an engineer. He works as technical director and divisional manager for the DEGES.
From the first noise barrier

**Vertical walls from simple materials**
Noise barriers have been erected alongside Germany’s motorways for the last 30 years. The first models, some of which are still in place next to federal trunk roads, were built upright and from simple materials, such as timber or smooth concrete.

**Curved ends absorb noise**
Timber in particular has not proved suitable as a material for noise barriers. It weathers too quickly when exposed to environmental and climate influences. A popular alternative is porous concrete, sometimes aluminium or acrylic is used. More recent walls are bent towards the carriageway in the top third for better noise absorption.

**‘Projecting walls’ for even better noise reduction**
These models have been adapted further: projecting noise barriers which are bent at a more extreme angle even closer towards the carriageway. A bespoke solution has been developed specifically for Hamburg. The DEGES is adding 3.5 to 4.5-metre projecting roofs to the walls. This will provide additional noise protection for surrounding neighbourhoods. Projecting noise barriers will be erected where it is impossible to build cut-and-cover tunnels.
Hamburger Deckel: One example already exists
The only solution that provides even more reliable protection from noise immission than the new noise barriers is tunnels such as the ‘Hamburger Deckel’ cut-and-cover tunnels. The first of its kind in Hamburg was constructed several years ago: it is the cover to the fourth bore in the north of the Elbtunnel, which was completed ten years ago.
We have all heard it: traffic news on the radio warning of congestion in front of the Elbtunnel is a daily occurrence. No wonder. The A 7, with its 964 kilometres, is not only one of the longest, but in the Hamburg area also one of the busiest motorways in Germany.

Extending from Denmark to the Austrian border, the A 7 is an attractive connection between Scandinavia and Southern Europe for business travellers and holiday makers. In addition to transit traffic, regional traffic is increasing continuously: both the A 23 and the A 7 provide direct connections to the city centre, the airport and the harbour from the western urban environs.

The section between the Hamburg Nordwest motorway interchange and the motorway junction at Hamburg Stellingen is used by 152,000 vehicles daily. This exceeds the theoretical threshold value for the existing six lanes of traffic by 26 percent. On the section between the junctions at Hamburg Schnelsen and Hamburg Nordwest, the limit is exceeded by as much as 51 percent. The high traffic load is mirrored in an above average accident rate.

There is no end in sight – quite the contrary. Projections show that traffic loads will increase in the future: the firm ptv Traffic Mobility Logistics AG has predicted that by 2025 there will be 165,000 vehicles travelling daily between the motorway interchange Hamburg Nordwest and the Hamburg Stellingen junction. In order to ensure that long-distance traffic will not come to a halt and mobility of Hamburg’s population is guaranteed, improvements to the motorway are essential.

‘The proposed extension of the motorway will concentrate traffic from the wider area on the trunk road and prevent cars from taking alternative routes and rat-runs through adjacent neighbourhoods. At the same time it gives us the opportunity to implement a comprehensive and integrated noise control concept in one go.’

Klaus Franke, Director of Building at the Hamburg Ministry of Economy, Transport and Innovation
For this reason, Hamburg and the federal government, which is responsible for construction, improvements and maintenance of federal roads, have agreed the implementation of this large-scale project: improvements to the A 7 to eight lanes. Additional slip roads on the right side of the carriageway will provide more space and better safety for entry and exit traffic at the junctions. Professor Dr Werner Brilon from the Ruhr University Bochum was appointed to compute the required number of lanes by means of special simulations. He found that the necessary capacity can be accommodated on the A 7.

The three noise reduction tunnels in Schnelsen, Stellingen and Altona are part of the pioneering work that is being carried out on the A 7, for which the Hamburg Ministry of Economy, Transport and Innovation had started analysing, computing and coordinating the individual project phases long before the actual commencement of construction. Everything should run smoothly – with traffic flows maintained as usual while the work is going on.

Within the coming years, the A 7 will be transformed from a congested road to Germany’s most compatible motorway – and there will be less news of traffic jams.

In the future, vehicles on the A 7 are to use six and in places eight lanes with two additional slip roads in some sections.

50% The accident rate is approximately 50% above the national average on the A 7 in Hamburg.

964 km make the A 7 between Austria and Denmark the longest motorway in Germany.
Not only the people living in the west of Hamburg will benefit from the ‘Hamburger Deckel’ cut-and-cover tunnels – room for new neighbours will be created.

Areas now severely affected by motorway noise will become attractive verdant residential neighbourhoods immediately adjacent to Altonaer Volkspark and the new motorway cover. Around 1,700 homes are proposed in the north of Bahrenfeld, in the area between the horse-race course and Holstenkamp. Further sites are proposed in Altona and Eimsbüttel. People moving into over 2,000 flats around the motorway cover will benefit from the proximity of the new parks – whilst living in the centre of town. The tunnel covers will provide new opportunities for recreation and leisure uses. The generous parks will create a completely new image for the city.

As a consequence, large parts of the new areas will directly benefit the people of Hamburg. The areas on top of the covers will close up the existing gashes in the townscape and thereby integrate new residential areas into the urban fabric. Hamburg’s west will do away with noise – and the quality of life in the entire city is improved.

‘Altona and Eimsbüttel will gain around 25 hectares of new green space, previously taken up by the motorway. We can accomplish several goals at once: new parks and allotments in addition to urgently required housing in centrally located neighbourhoods that will no longer suffer from motorway noise.’

Petra Störmer, Head of the ‘Deckel A7’ project group at the Hamburg Ministry of Urban Development and Environment (BSU)
Off to the allotment

A new home for Hamburg’s allotment gardeners

Planting, gathering, harvesting and relaxing: the new covers will also accommodate allotment parks. The tunnel roofs will be constructed to a high standard allowing allotment gardeners to cultivate their gardens as well as conduct their social lives.

The holders of existing allotment sites in the vicinity of the covers will relocate to the tunnel roofs. The plots in Schnelsen are expected to be ready for cultivation by 2017, in Stellingen by 2019 and Altona probably by the end of 2022. That is when the parks and allotments will be laid out.

No longer affected by noise, the areas adjacent to the motorway will be developed for housing by the City of Hamburg. Allotment holders are given notice and relocated on the basis of the local development framework.

A small herb garden, colourful flower meadows: the covers provide space for new plots in attractive allotment parks.

The proposal for the cover in Schnelsen by POLA Landscape Architects includes an allotment park.
Improvement schemes and new construction of federal roads such as the A 7 are generally financed by the federal government’s budget. The only precondition for funding is that the Federal Transport Infrastructure Plan classifies the measure as being urgent. This is certainly the case for the A 7. The associated noise control measures are also to be paid for by the federal government.

Since the Hanseatic City requested the improvements, Hamburg will carry the cost for the extra cover in Schnelsen and additional sections in Altona, including their design. First estimates put the city’s share at 150 million euros investment costs plus 17 million euros for planning. The land at the edge of the noise-reduced motorway will be developed for housings. The financial benefits of the development will reduce the financial burden on Hamburg’s budget, because the land on both sides is owned by the city of Hamburg.
What happens when?

<table>
<thead>
<tr>
<th>Year</th>
<th>Schnelsen</th>
<th>Stellingen</th>
<th>Altona</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>PD OP PA</td>
<td>PD OP PA</td>
<td>PD</td>
</tr>
<tr>
<td>2011</td>
<td>PD OP PA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2012</td>
<td>PD OP PA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2013</td>
<td>PD OP PA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2014</td>
<td></td>
<td>CW</td>
<td></td>
</tr>
<tr>
<td>2015</td>
<td></td>
<td>CW</td>
<td></td>
</tr>
<tr>
<td>2016</td>
<td></td>
<td>CW</td>
<td></td>
</tr>
<tr>
<td>2017</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2018</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2019</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Freight railway bridge (preliminary measure)

PD: Preliminary design, OP: Outline planning permission Federal Ministry of Transport, Building and Urban Affairs, PA: Planning approval procedure, CW: Construction work

**Schnelsen:**
- Start of planning approval procedure: first half of 2011
- Planning approval notice: expected late 2012
- Construction phase: expected from 2014
- Construction period: approximately three years
- Immediately afterwards: Construction of parks and allotment sites and relocation of allotments to the cover

**Stellingen:**
- Start of planning approval procedure: January 2011
- Planning approval notice: first quarter of 2013
- Construction phase: expected 2015 to 2018
- Immediately afterwards: Construction of parks and allotment sites and relocation of allotments to the cover

**Altona:**
- Information events followed by ideas workshop: April 2011
- Competition: May to June 2012
- Start of planning approval procedure: mid-2013
- Planning approval notice: expected 2014
- Construction phase: staggered with Stellingen section, approximately 2019
- Construction period: approximately four years
- Immediately afterwards: Construction of parks and allotment sites and relocation of allotments to the cover

Completion by 2/2022
Citizens participate

‘Hamburger Deckel’ — a community project from the outset: since the early 1980s the ‘Ohne Dach ist Krach’ (Racket without a roof) pressure group has been demanding a cut-and-cover tunnel for the A 7 in Altona.

The idea of putting a cover on the motorway as the source of noise seems obvious in the case of the A 7 because the federal trunk road runs in a cutting between Bahrenfeld and Othmarschen, and partly in a cutting in Stellingen and Schnelsen. The residents’ proposals failed repeatedly due to a lack of funds. Only now that the federal government is backing the motorway improvement scheme is this long-held wish finally coming true.

Citizens can also participate in the implementation. The residents’ suggestions have already been taken on board for the tunnel cover in Schnelsen, Stellingen and Altona.

Planning approval procedure for A 7 improvement scheme and uses on cover

- Information event about improvement scheme and competition
- Joint event
- Approval by the Commission for Urban Development
- Application for planning approval
- Landscape architecture competition
- Ideas workshop with residents for uses on cover
- Early consultation Article 3 (1) Federal Building Code
- Publication of documents for planning approval procedure
- Hearing
- Planning approval notice
- Publication and public consultation
- Approval of Local Development Framework
‘The motorway improvement scheme and the “Hamburger Deckel!” cut-and-cover tunnels can only enrich Hamburg’s west. Both will create space, reduce noise – and the tunnel roofs will provide new links between neighbourhoods.’

Landscape architect Professor Jürgen Weidinger, winner of the competition for the cover at Stellingen