SCIENCE CITY BAHRENFELD

Science Is Alive in the District

Hamburg

INTRODUCTION

In the world's metropolises questions of the future usually arise earlier than elsewhere. Such cities are capable of identifying problems and devising solutions, bringing about social change and improving people's lives.

Hamburg is such a metropolis of the future. We are eager to find answers to the global challenges of the 21st century: stop climate change, improve mobility in urban centres and shape the digital transformation of our society. In Hamburg we wish to be at the forefront of these developments and use science and research to discover new technologies and find creative solutions.

The Hamburg Senate has therefore further developed Hamburg as a science hub, expanded the universities, promoted their excellence and brought cutting-edge international research to the city. The inauguration of the XFEL 2017 X-ray laser, the only one of its kind in the world, was a milestone in basic research and has established Hamburg as the science metropolis of the North.

We are now embarking on another major project together with the University of Hamburg and DESY. Science City Bahrenfeld is to be built in the west of Hamburg: a centre for basic research and applied science, an incubator for innovations and technology transfer as well as a residential area with attractive apartments and recreational areas for students, scientists and creative people.

Science City Bahrenfeld is designed to offer optimal conditions for scientific institutions, start-ups and innovative companies by providing laboratories and modern workplaces for bright minds from around the world. Altona Volkspark will be the green centre of the future Science City Bahrenfeld. Green paths and a wide range of sports and leisure facilities will link new residential areas, educational and research facilities and innovative business sites in an intelligent way.

Modern urban development projects, such as HafenCity, Mitte Altona and the »Upstream on Elbe and Bille« master plan, are part of the metropolis of the future Hamburg. Science City Bahrenfeld will be yet another milestone: a district offering a high quality of life, innovative research facilities, good and affordable apartments, attractive recreational and leisure areas and a direct link to Hamburg's rapid transit railway system.

The Senate is proud to present its vision of Science City Bahrenfeld in this brochure. In collaboration with the Ministry of Economic Affairs, the Ministry of Science, the Ministry of Environment and Energy, the Altona District Office, DESY and the University of Hamburg, a first draft for the development of Science City Bahrenfeld has been prepared for the Senate to provide a strong impetus for further exchanges between politics, the administration, business and science.

Dr. Peter Tschentscher,
First Mayor
Free and Hanseatic City of Hamburg

PERSPECTIVE FOR THE FUTURE

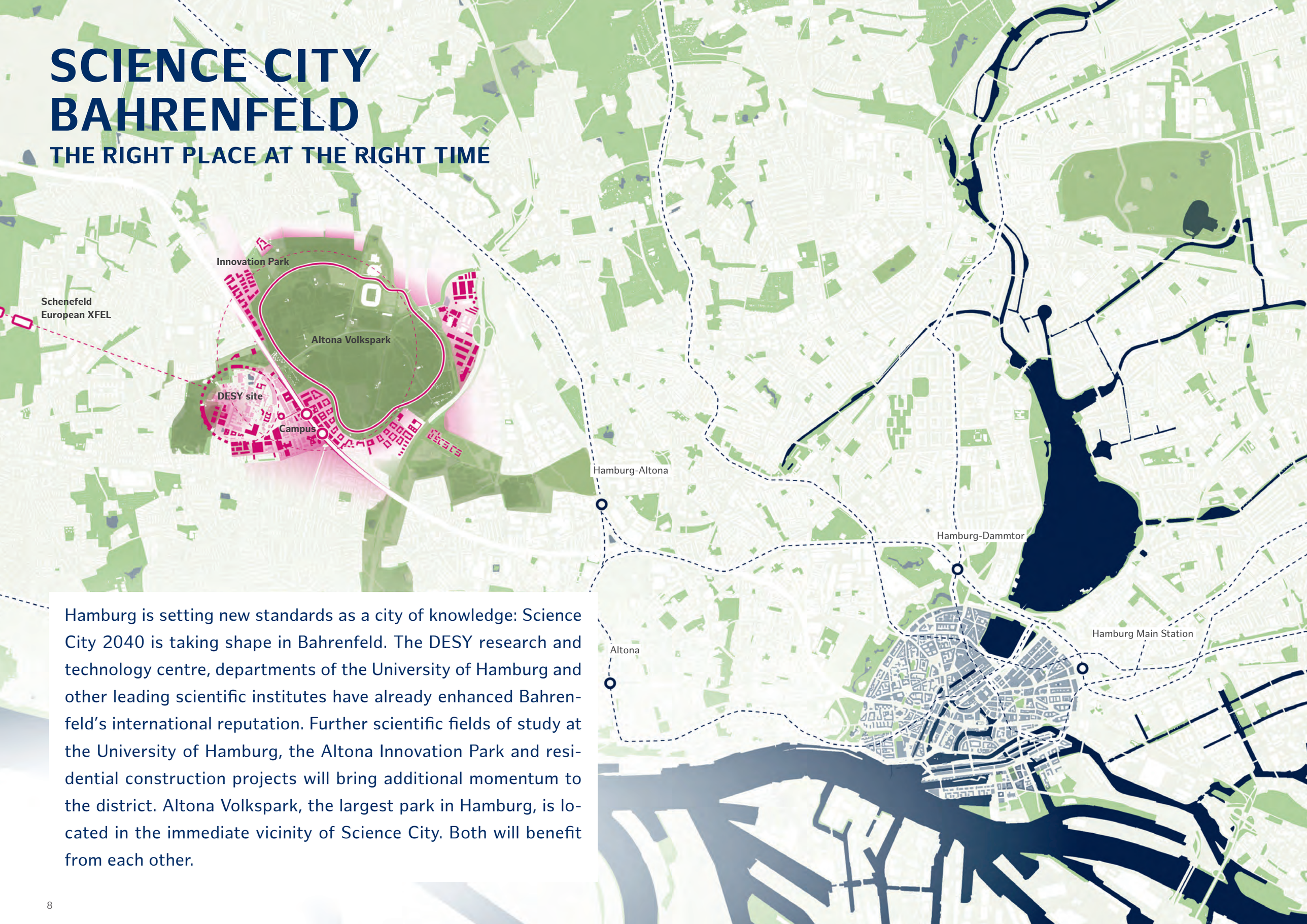
SCIENCE CITY BAHRENFELD

Campus Axis West – View towards Luruper Chaussee

CONTENT

SCIENCE CITY BAHRENFELD

THE RIGHT PLACE AT THE RIGHT TIME



Hamburg is setting new standards as a city of knowledge: Science City 2040 is taking shape in Bahrenfeld. The DESY research and technology centre, departments of the University of Hamburg and other leading scientific institutes have already enhanced Bahrenfeld's international reputation. Further scientific fields of study at the University of Hamburg, the Altona Innovation Park and residential construction projects will bring additional momentum to the district. Altona Volkspark, the largest park in Hamburg, is located in the immediate vicinity of Science City. Both will benefit from each other.

LOCAL CONDITIONS

The city is seizing the opportunity to merge the district's existing features in an intelligent way with new developments, thereby creating a whole new district.

HAMBURG BAHRENFELD
District of Altona
Area 10.9 km2
Population 31.160 (as at 31 December 2017)

The city is seizing the opportunity to merge the district's existing features in an intelligent way with new developments, thereby creating a whole new district. The research campus in Hamburg-Bahrenfeld housing DESY, the physics department of the University of Hamburg and other research institutes is a major science centre and a natural feature of Bahrenfeld. What is remarkable though is the fact that it was initially built on a former airfield and has continued to grow alongside the neighbouring districts and Altona Volkspark. It's inner-city location and proximity to educational institutions, shopping facilities and ample open spaces are a promising starting point for knowledge-based urban development.

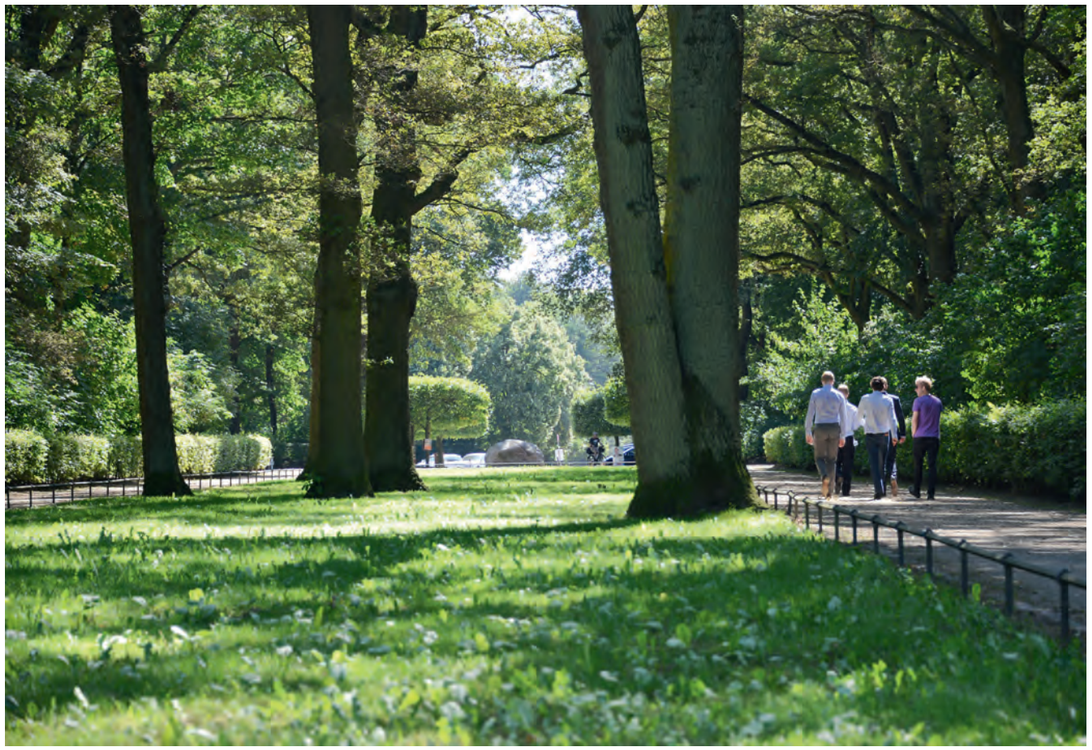
The extension of the DESY site and the establishment of natural science facilities by the University of Hamburg will be strong stimuli for the upcoming Science City Bahrenfeld. Moreover, other important building projects are planned in the immediate vicinity: around 2,500 new apartments on the site of the former trotting course and in the adjacent areas to the east, the new Altona Research and Innovation park for research-oriented companies and start-ups in the north, the redesign of Ebertplatz and a railway link. The close spatial relationship of these projects will create new urban values for the knowledge city of tomorrow. The large number of development initiatives offers the opportunity for a coordinated campus and neighbourhood development.

From today's viewpoint there is a lack of attractive lanes between the existing research campus and the districts. A lively centre will be developed in this area. All existing boundaries, such as the Luruper Chaussee arterial road, have to be eliminated. This street has the potential to become sort of a Knowledge Boulevard. Given new attractive spaces to linger at and additional transport opportunities, Luruper Chaussee may become the first address for Science City's next-generation flagships – including prominent campus entrances, connections to residential areas and to Innovation Park as well as Altona Volkspark. This means that the future also belongs to arterial roads; in Science City science can be experienced at street level.

The large number of projects planned in the immediate vicinity of the existing research campus will bring about change; it will be essential to be mindful of the spaces available, the residential and work areas as well as the district's residents. One thing for sure: the future Science City Bahrenfeld will fit in and will only have a positive effect if the entire district is involved in the dialogue.

Science City Bahrenfeld is designed to offer optimal conditions for scientific institutes, start-ups and innovative companies by providing laboratories and modern workplaces for bright minds from around the world.

Dr. Peter Tschentscher, First Mayor of the Free and Hanseatic City of Hamburg



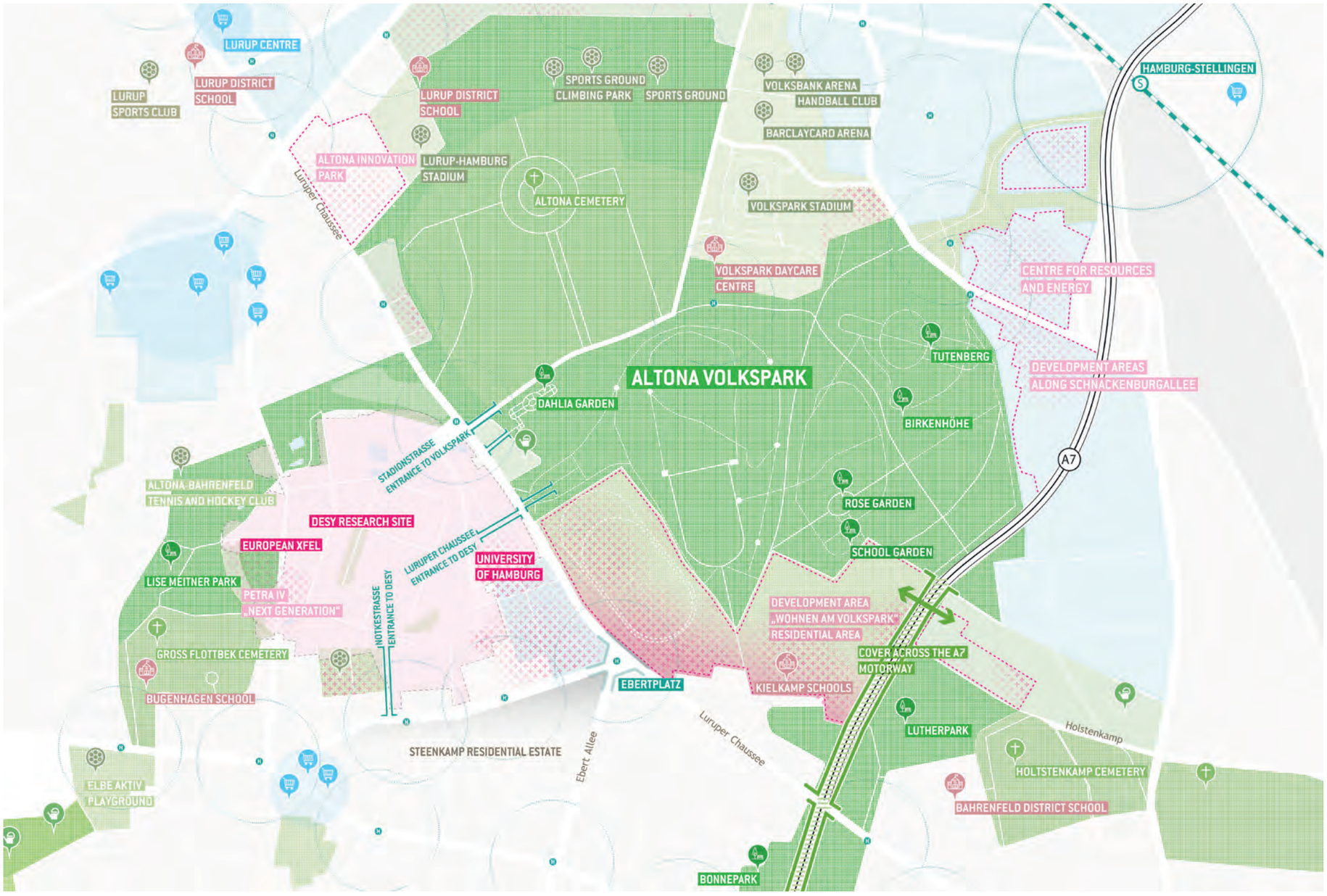
Altona Volkspark

TREASURE MAP – LOCAL POTENTIAL

The resources available in the immediate vicinity will become part of a larger picture. Groundbreaking projects, institutions, schools, parks and green spaces define Bahrenfeld's identity and play an important role in the development of Science City. Urban development will be further stimulated by developments, such as those around the Volkspark Stadium of Hamburger Sportverein (HSV) and the new concept for the Recyclinghof ZRE (Centre for Resources and Energy) and its exemplary combination of waste utilisation and recycling plant producing climate-neutral energy.

The existing open-space axes and the Second Green Belt, the outer of the two Hamburg Green Belts, and Volkspark will become the actual sources for the future of Science City – they will not only provide recreation as well as sports and exercise facilities, but will also be vital communal spaces linking the various parts of Science City. The "Hamburger Deckel" covering the A7 motorway will provide the Bahrenfeld district with an essential link to the main axes, thereby ensuring a direct green connection from Altona Volkspark to the river Elbe and also to the city centre. Due to this cover the green spaces of Lutherpark and Bonnepark, which are currently separated by the motorway, will be rejoined. This will not only enhance the quality of life in general, but will also enlarge the green space available allowing for allotment gardens, a promenade for pedestrians and cyclists, meadows and parks as well as play and leisure areas.

The current situation is illustrated in the Treasure Map. The relevant resources in the vicinity and in the main potential areas for current development projects in the urban area are indicated. Coexistence is to be turned into stronger interaction in the future.



Legend:

- DESY site
- Industrial and work areas
- Residential neighbourhoods
- Green spaces
- Projects under development
- Potential development areas
- Current public transport stops
- Leisure/recreational area
- Sports facility
- Allotment gardens
- Cemetery
- School
- Local supplies

LOCAL SCIENCE

Scientific institutes, such as DESY, the University of Hamburg or the Max Planck Society, have already provided a unique infrastructure for natural sciences in Bahrenfeld. It is our aim to expand the ultra-modern and internationally linked science campus. Science City Bahrenfeld is a visionary concept providing perfect conditions for interdisciplinary research and study and is a driving force for innovation in society and business.

WHAT RESEARCH IS CONDUCTED?

Bahrenfeld ranks among the top international research centres in Germany. This is where the smallest components of elementary building blocks in the world and the great mysteries of the universe are researched and innovative materials and new drugs are sought. Eminent researchers in photon and nano sciences examine how complex matter functions, how electrons, atoms and molecules interact in space and time. The University of Hamburg and the DESY research centre are leaders in the discovery of light-induced superconductivity, laser-directed chemistry, the time-resolved nanocrystallography of proteins or novel chemical methods of nanoparticle synthesis. Research is at the core of the fundamentals and applications for materials science, medicine and nanotechnology.

The planned Centre for Molecular Water Research (CMWS) will expand this spectrum to include the basic element of life: water. Research in the field of particle physics, astrophysics and mathematical physic will be conducted to find answers to questions of the universe that have not been answered yet: how did our universe come into being? Where did dark matter come from, and what is it anyway? How and when did the gigantic black holes form that are at the centre of the galaxies? The topics range from mathematical theories to physical questions, from theoretical models in particle physics to astrophysical and cosmological observations.

Cellular processes in infection research and structural biology are analysed. The aim is to better understand pathogens and find new treatments against bacteria, parasites and viruses. Particle accelerator technologies are another focus of the top research carried out on campus. As the superconducting TESLA accelerator technology developed by DESY is meanwhile used in many particle accelerators worldwide, the focus is now on the development of ultra-compact plasma accelerators. This not only extends the range of applications in research but can also revolutionise industry and medicine, for example, by using implants to directly combat tumours.

The Centre for Data and Computer Science (CDCS), a centre for scientific computing, will be set up on campus to develop new methods for the increasingly data-intensive research in particle accelerators.

Nitrogen ice for visitors on open day – DESY Day

The European XFEL 2.1 km accelerator tunnel

PARTICLE ACCELERATORS AND RESEARCH NETWORKS

The inauguration of the largest X-ray laser in the world, the European XFEL, in September 2017 was a global milestone. However, Hamburg's status as the world capital of X-ray research started much earlier: the DESY research centre – in close cooperation with the University of Hamburg – has been engaged in the development, construction and operation of huge particle accelerators to examine the structure and function of matter since it was founded in 1959. The three best facilities of their kind in the world are located in Hamburg, namely the free-electron lasers FLASH and European XFEL as well as the PETRA III synchrotron radiation source. They generate ultra-short X-ray flashes allowing for photos and films of the

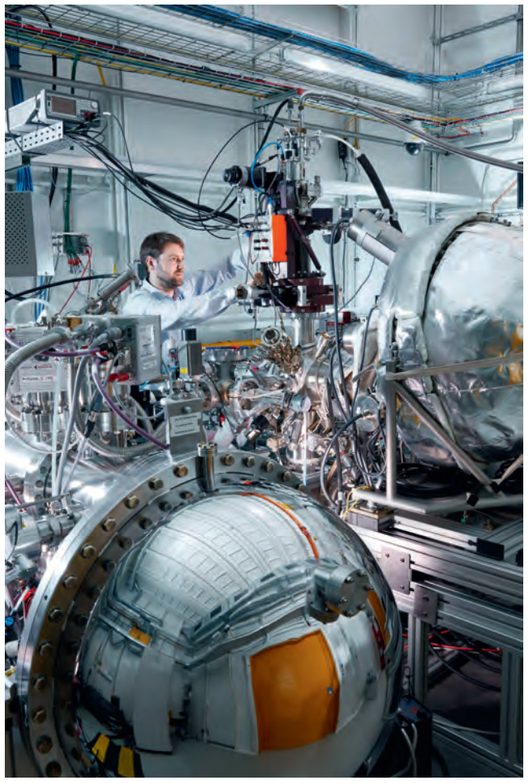
Science City Bahrenfeld will become THE major research campus in Germany – providing world-class facilities for scientific research and outstanding study and teaching conditions. This is the dawn of the science site of the future.

Prof. Dieter Lenzen, President of the University of Hamburg

nanoworld to help unlock the secrets of nature. DESY also plans to set up the ultimate 3D microscope for 21st century material and drug research on the Hamburg campus, the PETRA IV "Next Generation" X-ray source.

Every year DESY's research light sources, the combination of which is unique, attract thousands of scientists from all over the world to conduct research at these large-scale facilities. Renowned research institutes, such as the European Molecular Biology Laboratory, the Geesthacht Helmholtz Centre and the Max Planck Society, have branches on campus so they may have regular access to the unique light sources. The research facilities are thus an anchor and source of interdisciplinary exchanges and the development of new research concepts. The special processing methods and complementary methods at the large-scale facilities, such as cryo-electron microscopy for structural resolution at the Centre for Structural Systems Biology (CSSB), are supplemented by an electromagnetically shielded, low-vibration clean room (dust-free room) at the University of Hamburg, thus making Hamburg a unique centre for matter research.

The Hamburg Advanced Research Centre for Bioorganic Chemistry (HARBOR) of the University of Hamburg, which is currently under construction, will provide the infrastructure for experiments with ultra-short time resolution on molecular biological systems. The aim is to develop methods for the targeted triggering and control of processes in single molecules with the aid of light in order to reveal and examine these processes. Just like the research conducted at different facilities, the research carried out by DESY and the University of Hamburg in various disciplines on campus is interlinked, for example, with the planned interdisciplinary Wolfgang Pauli Centre for Theoretical Physics. In view of the increasing interdisciplinarity and internationality of research, Hamburg has an invaluable development lead.



PETRA III Experimental hall

Detail of aerial image, new PETRA IV synchrotron radiation source

The European X-ray laser XFEL and the new PETRA IV "Next Generation" synchrotron radiation source will be the major future research facilities at Science City Bahrenfeld. They will enable new revolutionary methods in materials and drug research and attract the best scientists from around the world.

THE PETRA IV „NEXT GENERATION" FUTURE PROJECT

DESY is developing PETRA IV "Next Generation", the best 3D X-ray microscope in the world. "Next Generation" will generate images of processes in the nanocosmos that are hundreds of times more detailed than those available today. PETRA IV "Next Generation" will thus enable decisive research advances in topics, such as energy, multifunctional materials, information technology, medicine and mobility which pose major challenges to modern society today.

By using innovative accelerator technologies, PETRA IV "Next Generation" will make it possible to generate X-rays of unprecedented luminosity. They can be focused with maximum efficiency to diameters of a few billionths of a metre (nanometre), thus providing ultra-precise insights into the molecular processes of materials and active substances.

Such precise insights into the molecular machines of new materials enable researchers to analyse complex processes inside catalysts, batteries or microchips under realistic operating conditions and to tailor innovative materials for specific requirements.

Due to the PETRA IV "Next Generation" high-resolution 3D X-ray microscope and the European X-ray laser XFEL Science City Bahrenfeld will have an internationally leading research infrastructure that will attract the best minds from around the world and will not only strengthen the region but Germany in general as a science and technology site vis-à-vis international competition.

TOP RESEARCH AND EXCELLENT SCIENCE IN ONE PLACE

The outstanding research infrastructure in Science City Bahrenfeld will provide ideal conditions for courses in chemistry, physics and biology as well as for teacher training. More than 5,000 students will benefit from modern lecture halls and laboratories: interactive study areas for individual and group workstations equipped with state-of-the-art media technology will be excellent places to meet and try out new teaching and learning concepts. The disciplinary and interdisciplinary courses at the University of Chemistry, Physics or Nanosciences will be offered in one place in the future.

The modern education and research campus will offer excellent conditions which will also attract international students to the English-language "Physics" or "Mathematical Physics" Master programmes. In 2019 the "Light and Schools" physics school laboratory of the University of Hamburg is moving into its own building. Together with the DESY "physik.begreifen" student laboratory, which has been in existence since 1997, this place of study enables students of all ages to independently make discoveries and do creative research. This is the place where school meets science, be it everyday phenomena or cutting-edge technology. Early childhood education is provided by the "Kleine Forscher Hamburg" network supported by DESY and run by the Haus der kleinen Forscher [House of Little Scientists].

CSSB (Centre for Structural Systems Biology)

TRANSFER AND INNOVATION

Research centres are vital for transfer and innovation. In this respect Science City Bahrenfeld will establish itself as a driving force for Hamburg and northern Germany as locations of choice. The overall concept envisages a contemporary environment generating strong networks and exchanges – also with business and industry – in order to efficiently shape transfer and innovation. Science City Bahrenfeld will offer technology-driven companies conditions that are internationally outstanding. Many of the basic research findings have already been implemented in trend-setting innovations, be it the development of medical products, such as new detection methods, or new structural insights for drug research. The combination of excellent technical infrastructure and in particular the presence of excellent scientists from complementary disciplines is unique.

An innovation centre supported by DESY, the University of Hamburg and the Free and Hanseatic City of Hamburg will be built at Science City Bahrenfeld. Starting in 2020 start-ups and young companies will be provided with the working environment needed for healthy growth, including workshops and laboratories. Another key project is a technology and start-up centre, which is currently in the planning stages, in the fields of life science, biotechnology, nanotechnology and new materials that will get EUR 95 million in federal funding.

Other activities that firmly establish innovation and transfer on campus are pursued by the "beyourpilot – Startup Port Hamburg" platform, a collaboration of local university and research institutes providing consulting and other services to generate knowledge-based start-ups and spin-offs. PIER, a strategic partnership of DESY and the University of Hamburg, provides additional activities to promote the founding of companies, thereby making a visible contribution to knowledge and technology transfer in the metropolitan area.

DESY also operates the MicroTCA TechLab on campus, a Helmholtz Innovation Lab where science and industry are already closely collaborating in the field of electronics, as well as the DESY Innovation Village, an office and laboratory building where DESY provides facilities for innovation projects and start-ups.

The transfer of knowledge is vital for promoting creativity. The mutual exchange of knowledge between the scientific community and society strengthens future-oriented social development. Citizens are invited to experience science on DESY guided tours, at evening events such as "Wissenswerte", the daily "Wissen vom Fass" lectures or the Hamburg "Nacht des Wissens". The DESYUM visitor centre, which is currently in the implementation planning stage, will give schoolchildren as well as visitor groups of all ages further insights into science.

> With Science City Bahrenfeld we are creating a model for the research campus of the future where cutting-edge research and ultra-modern large-scale research facilities, the training of young scientists and the transfer to industry and society are closely interlinked and consistently implemented as sustainable concepts.
>
> Prof. Helmut Dosch, Chairman of the DESY Board of Directors

DRIVING THE FUTURE

WHAT TOPIC WILL GAIN IN IMPORTANCE?

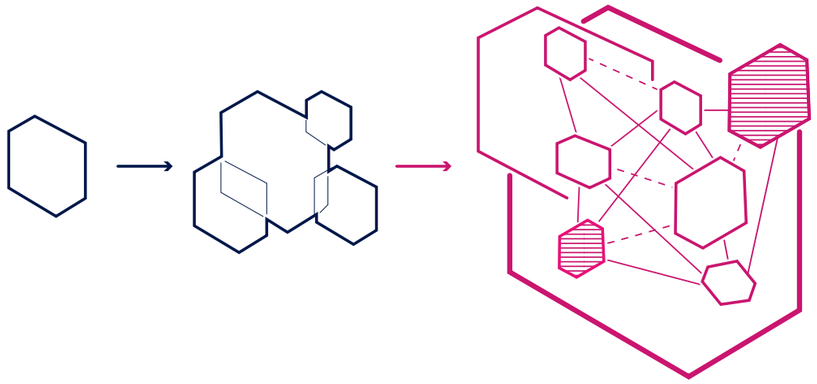
Research, learning, working, living – today's science is open, interlinked and diverse. New solutions and innovations are generated by the transnational exchange of science, business and civil society. This is reflected in the science cities of tomorrow. International science cities are accessible and focusing on interacting and cooperating with urban districts.

DEVELOPMENT MODEL

The ivory towers of research and science are a thing of the past. The science cities of the future will provide strong stimuli for the social and economic development of urban areas and make it possible for knowledge to be shared across society. They are complex and learning ecosystems enabling different knowledge creators, economic sectors, administrations and civil society to mutually benefit from their interaction.

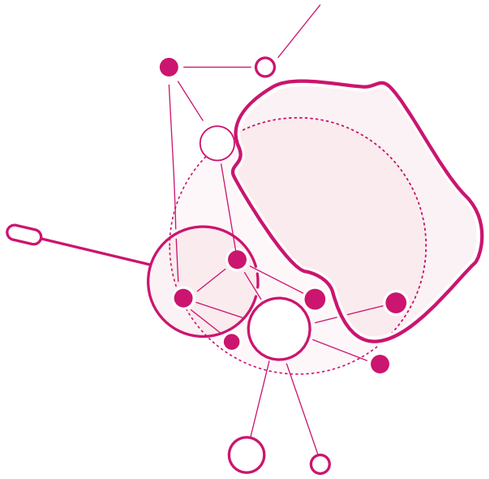
In comparison to the traditional and historically grown campuses of universities and research institutes as well as institutions in the countryside, modern science cities are highly interconnected and integrated into the city. Educational institutions for science and research are closely linked to innovation parks, residential areas, green spaces, squares and other services, such as health centres.

The science city innovation model goes beyond campus areas and includes the neighbouring areas and existing facilities. In short: science cities turn cities into a campus. The exchange between people of different knowledge and urban backgrounds is essential for the development of lively neighbourhoods. Plus: the sustainable use of existing resources, intelligently linked mobility systems as well as green spaces and recreational areas nearby play an increasingly important role in the development of science cities. Altona Science City Bahrenfeld is ideally located due to its close proximity to Volkspark.



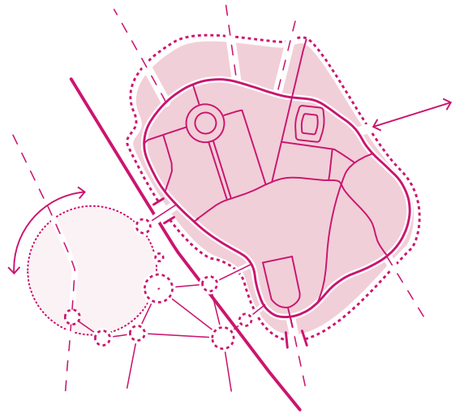
FROM CAMPUS TO SCIENCE CITY NETWORK
The chart illustrates the core idea that makes science cities stronger, not only today but also in the future. The evolutionary steps show how campus facilities that used to be closed entities have been split at many knowledge centres and have gradually been integrated into the urban environment. The development of a polycentric and interlinked system of several campus areas in the city will be the benchmark for Science City Bahrenfeld. Essential core buildings for research facilities, science, education and economy departments in Science City Bahrenfeld will be interlinked by new paths and collaborations.

FIT FOR THE FUTURE



KNOWLEDGE CULTURE
Knowledge is the breeding ground that science cities thrive on. This involves much more than intensive networking by scientific institutes. Their interdependence with other parts of society is gaining in importance. Such exchanges are productive in a number of ways – collaborations with companies, the integration of scientific institutes into the local educational infrastructure as well as projects with civic initiatives promoting dialogue and the exchange of knowledge between civil society and scientific experts.

Bahrenfeld has the best prerequisites for a sustainable science city: it will become the linchpin of a new knowledge culture linking scientific laboratories, learning centres, incubators, residential areas and schools with services in the district and attractive leisure facilities which are all within easy reach. Altona Volkspark plays a special role regarding quality of life.



OPEN SPACES
The public areas of modern science centres have now become important locational factors in the competition for the brightest minds. The world's leading science cities provide high-class open spaces with meeting points for different groups of people, attractive footpaths and bicycle paths, sports and recreational facilities as well as natural spaces. The quality of open spaces greatly contributes to the image of science cities. Exchanges and quality of life, networking and neighbourhoods that are within easy reach result in a lively campus.

Altona Volkspark is a unique selling point for Science City Bahrenfeld. The key to success is the sustainable investment in more open-space projects and places that are interconnected as well as in the upgrade of main entrance areas while preserving the special character of the listed Volkspark.

MOBILITY

Short distances between study centres, education and conference centres, research facilities, refectories as well as between campus, innovation park and neighbourhoods are the key to successful science city developments. Good accessibility on foot, by bike or by public transport is a prerequisite. Shuttle systems between stops and campus centres, the availability of mobility stations, attractive foot path and bicycle lane networks, as well as sustainable logistics models for managing research facilities – science cities actively contribute to a global change in commuting behaviour and may become local pioneers of new forms of mobility.

To fill the new mobility vision with life in the district, an efficient and sustainable mobility service is decisive; a bicycle route and a supraregional bicycle highway are also being considered. The options for a direct high-speed train link to Science City Bahrenfeld are currently also being investigated.

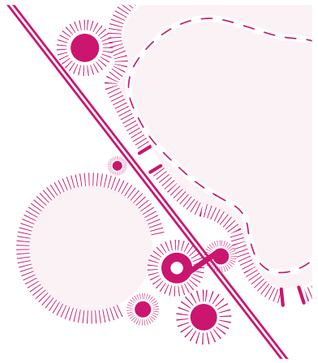


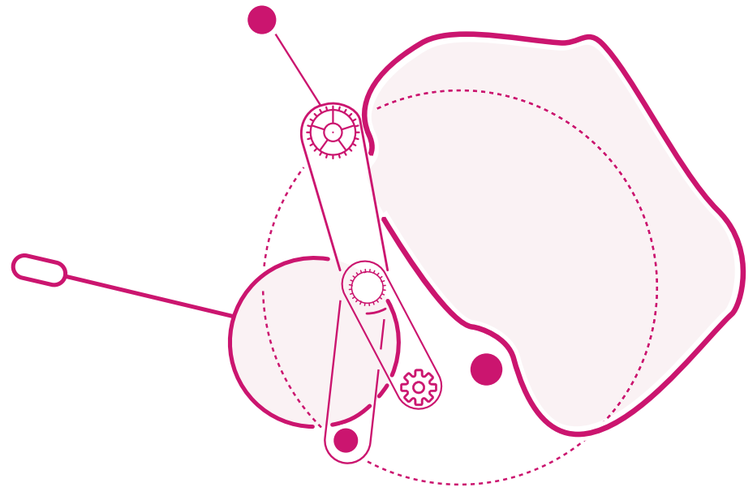
IMAGE AND VISIBLENESS

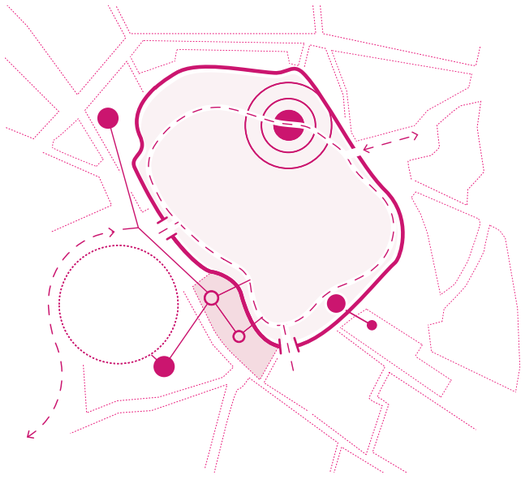
Science cities set standards with their groundbreaking architecture. It is not just a matter of making science institutes visible in urban areas. Tomorrow's science cities will be a natural feature of everyday urban life. Their architecture literally seeks a dialogue between science and urban society. Transparent buildings, fluid transitions between foyers and public spaces, buildings made of sustainable materials – science cities create a public climate of trust and curiosity. Attractively designed multi-purpose open spaces contribute to the image of science cities in the same way as urban planning and architecture.

Like no other place in Hamburg, Science City Bahrenfeld will establish an image as the green oasis of knowledge thanks to Altona Volkspark. Exemplary open architecture at the entrances and public intersections could become "shop windows of science" in the future.

> It is amazing to see how everyone is working together to make Science City Bahrenfeld happen. For the first time in the history of Hamburg, science and research play the leading role in developing a district. We hope that this will lead to even more scientific excellence, innovations, quality of life and jobs in Hamburg in the future.

Katharina Fegebank, Senator, Ministry of Science, Research and Equalities





QUALITY OF LIFE, SPORTS AND HEALTH

Anyone researching and lecturing or working in science-related companies today needs more than just his/her daily work routine. Many people wish to have sports and fitness facilities in their working environment or even live in science cities. Short distances to work, including different locations in science cities, be it the laboratory, the co-working area or home office, as well as kindergartens and schools in the neighbourhood are now decisive locational factors and a real luxury for an active knowledge society.

Science City Bahrenfeld can score points with its existing and upcoming sports and health facilities at Altona Volkspark – the combination of residential areas and science will become the norm at Science City Bahrenfeld.

INNOVATION

Science cities develop their full potential when they succeed in making scientific expertise usable by and accessible to society. The fruitful linking of science and industry is a prerequisite for new innovation centres. This requires providing space for start-ups and research-oriented companies in the immediate vicinity of knowledge institutions where new technologies can be tested and further developed.

In view of the relocation of further departments of the MIN Faculty (Mathematics, Computer Science and Natural Sciences) of the University of Hamburg, the planned incubator on the research campus and the new Altona Innovation Park, Science City Bahrenfeld will provide an excellent platform for basic research, applied research and transfer to marketable products.

A VISION FOR 2040

KNOWLEDGE AND SHAPING TOMORROW'S CITY

When looking to the future, there are many opportunities to combine the old and the new. The vision of Science City Bahrenfeld's future shows how the DESY research centre, the University of Hamburg, other scientific institutions and partner institutes, innovative knowledge economies as well as existing and additional residential areas with public spaces and Altona Volkspark will complement each other in the district.

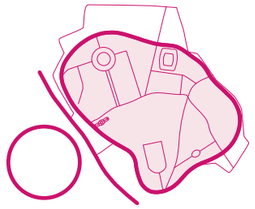
CONCEPT

The whole is more than the sum of its parts. In addition to the main campus facilities other areas around Volkspark are coming into focus. They offer new opportunities for research institutes, companies and innovative businesses.

In Science City Bahrenfeld science is turning into an urban development project. Knowledge is the driving force and is created in an open atmosphere within a knowledge city organism. The breeding ground for knowledge production and innovation is the intensive spatial and programmatic networking between scientific institutes and urban authorities. Below are the cornerstones of the new Science City presented in three steps:

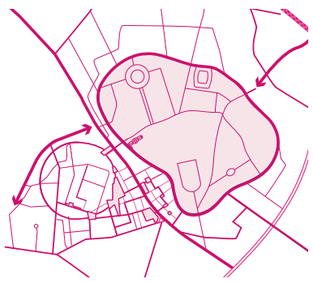
1. GERM CELLS RESEARCH CAMPUS AND VOLKSPARK

- The existing research campus and the listed Altona Volkspark are at the core of Science City Bahrenfeld.
- The new Ring Boulevards – (DESY's PETRA Ring and Parklane as a circular route around Volkspark) – are visible open-space projects providing orientation and connecting neighbourhoods. Both avenues are also lively corridors for pedestrians and cyclists alike.
- The urban open-space connection of both Ring avenues is of great significance – Luruper Chaussee plays an important role as a link.

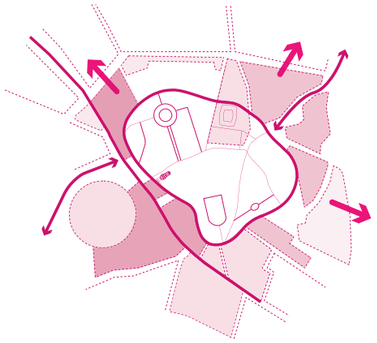


2. SCIENCE CITY MOBILITY NETWORK

- DESY's PETRA Ring spans across a new network of open spaces and development areas at the research campus and the connections to places beyond.
- Parklane will be linked to the superordinate Second Green Ring network and the new green corridor of the "Hamburger Deckel" covering the motorway in Altona from Volkspark to the river Elbe.
- Parks, cemeteries, gardens and other green spaces will become part of a green network.
- Various path connections and public areas will be developed in a way to form a coherent network in Science City – allowing for transparency, accessibility and more exchanges.
- City of short distances: all places – parks, campuses, residential areas – will be within easy reach via a dense network of footpaths and bicycle lanes.



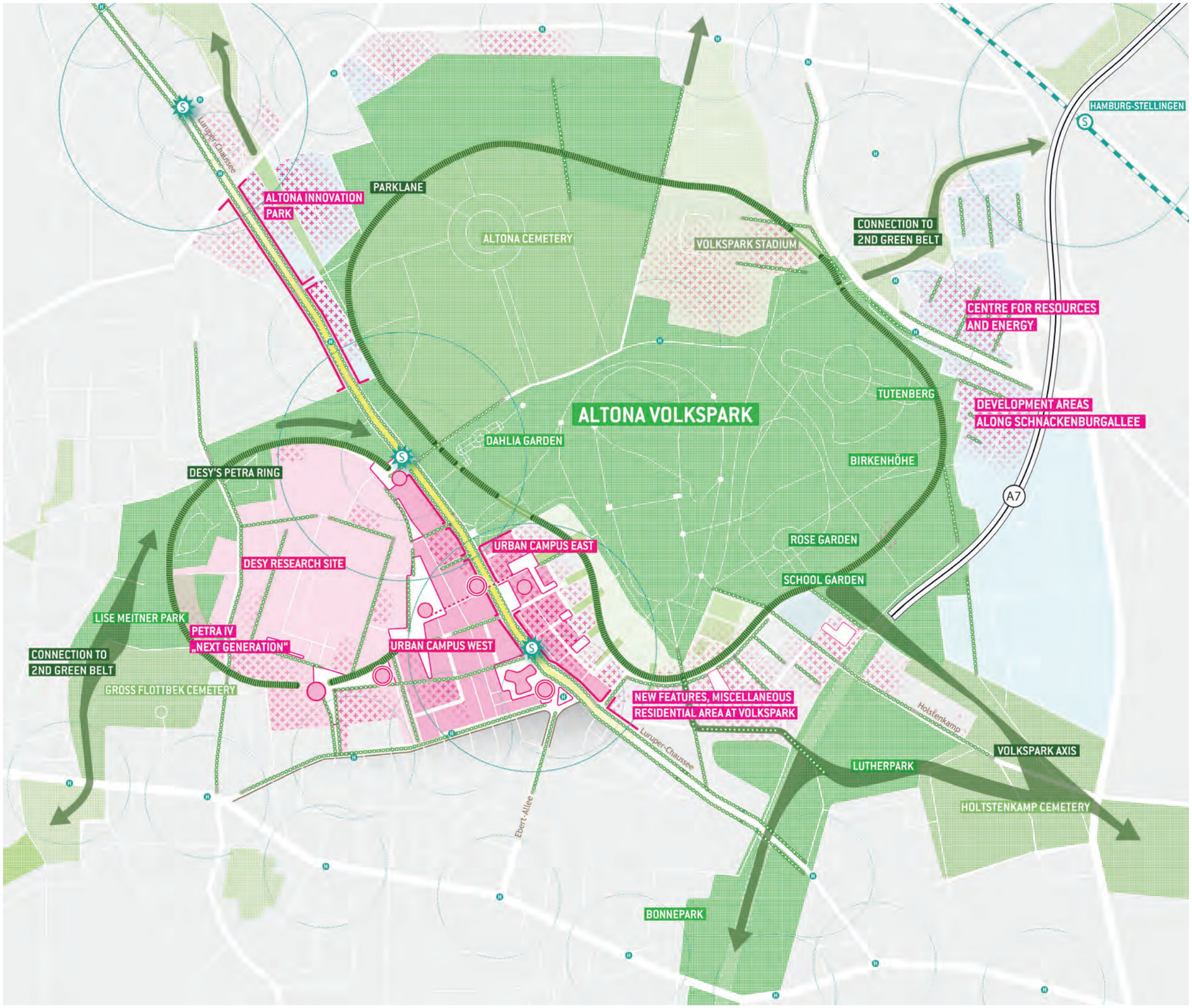
- New attractive public areas will create a lively ambience.
- The envisaged link to the city centre via a new rapid transit railway link will make Science City easily accessible and even more attractive.
- Science City ensures mobility: innovative mobility services, sharing systems and new mobility hubs at strategic locations will facilitate changing from one mode of transport to various others.
- In addition to the open-space circular routes, the Luruper Chaussee arterial road will be the central axis of Science City, a pulsating knowledge boulevard with major scientific facilities, public campus spaces, stores and local district shops providing excellent urban quality for pedestrians and cyclists alike.



3. SCIENCE CITY – THINK BIG ABOUT PROGRAMMES

- Merging Science City with the district is the prerequisite for an internationally competitive science, business and research site.
- Further contacts for new fields of development and topics of the future will be established.
- Various trends regarding the development of tomorrow's science city are to be incorporated in the vision for the future.
- Science City may be used in various *major ways:*
  - *Extension of research campus* – DESY's options for growth, various university departments, central university buildings, knowledge-oriented companies, Albert Einstein Ring, sports centre, cultural and social facilities and landmarks at major entrances.
  - *Former trotting course* – excellent development options for a mix of scientific and residential areas (families, students, scientists), shops and trades, schools and daycare centres.
  - *Innovation park* – suited for knowledge-based businesses and start-ups.
  - *Areas in the northeast* – Volkspark stadium with its sports training centre and events; the Centre for Resources and Energy [Zentrum für Ressourcen und Energie (ZRE)] with its modern recycling facility and environmentally friendly energy production as well as the areas south of Schnackenburgallee.
  - *Altona Volkspark* – recreation, sports and exercise, garden cultivation, education in the park, forest experience.

STRATEGIC PLAN



Potential development areas and the relevant future drivers of Science City Bahrenfeld are indicated in the strategic plan.

The strategic plan shows at a glance how Science City fits into the environment. The superordinate green corridors and the inner network of paths, squares and public transport stops stretching from DESY's PETRA Ring and Parklane all around Volkspark. The key areas of Science City, major facilities and landmarks in busy public areas are highlighted.

In addition, the strategic plan gives an overview of the locations of key areas. The mix and close proximity of study, research and science facilities as well as green spaces, residential and social areas, trade, sports and innovative companies are what Science City is all about.

Legend:

- DESY site
- University of Hamburg
- Industrial and work areas
- Residential neighbourhood
- Squares
- Knowledge Boulevard
- Superordinate green
- Parklane/DESY's PETRA Ring
- Green axis
- Current public transport stops
- Planned public transport stops
- Key development areas
- Major facilities
- Key areas

URBAN PLANNING AND OPEN SPACES

Bahrenfeld is seizing the opportunity to place its magnificent Volkspark at the centre of its future development. Science, research and residential areas are systematically integrated into the urban environment as mixed-use neighbourhoods.

Bahrenfeld is seizing the opportunity to place its magnificent Volkspark at the centre of its future development. Science, research and residential areas are systematically integrated into the urban environment as mixed-use neighbourhoods. The fundamental concept of Science City is based on two principles – the combination and mix of exterior and interior areas. Science City will be embedded into the city's overall green open space system along the landscape axes and the Second Green Belt, the adjoining green corridors and the green A7 motorway cover towards the river Elbe. The various pedestrian paths and bicycle lanes will just as systematically be integrated into residential areas; they will connect public areas and open spaces – Science City will be one huge network.

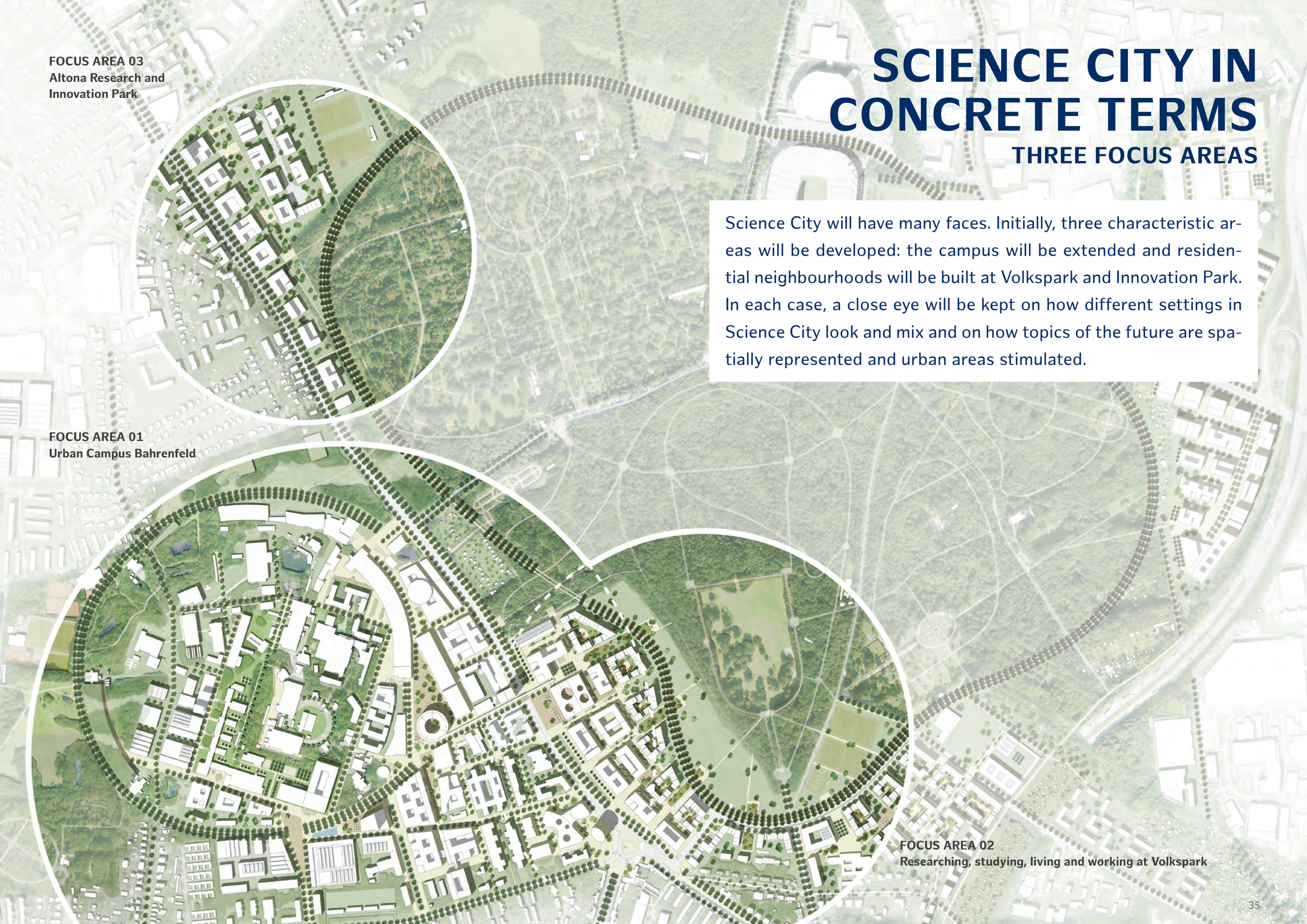
Three avenues will provide orientation: the image of Volkspark will be greatly enhanced by the new Parklane encircling it with pedestrian paths and bicycle lanes to ensure easy access to all residential areas in the vicinity of Science City. DESY's striking PETRA Ring for particle acceleration will symbolically be "lifted" and further enhanced by an alley. Luruper Chaussee will be transformed into a tree-lined boulevard and will become the backbone of Science City.

This strong spatial framework offers many options for dynamic development in the decades ahead.

SCIENCE CITY IN CONCRETE TERMS

THREE FOCUS AREAS

Science City will have many faces. Initially, three characteristic areas will be developed: the campus will be extended and residential neighbourhoods will be built at Volkspark and Innovation Park. In each case, a close eye will be kept on how different settings in Science City look and mix and on how topics of the future are spatially represented and urban areas stimulated.



FOCUS AREA 01
URBAN CAMPUS BAHRENFELD

Today a successful campus for top research and science, tomorrow a public magnet for scientists, students and residents of Bahrenfeld. Not only will a new centre for the district be created by transforming Luruper Chaussee but also a link to Volkspark.

Map detail, Focus Area 01 (images 01–06)

Campus West and DESY tower (image 01)

Campus life in the city – this is a prerequisite for the interconnected knowledge society and will be a key requirement for the additional interconnected campuses to be built around the existing research campus.

The campus of the future will present itself as a coordinated system of short distances between the existing research facilities and many parts of the MIN faculty of the University of Hamburg. At the same time, an expanded and varied range of public communication and meeting areas will be provided. This will not only ensure exchanges and synergies between DESY, the university and other research institutes but will also set new priorities for urban life on campus. Major paths, avenues and streets will integrate neighbouring urban areas. Open, transparent and mixed-use areas for research and science, which can be used by both science and the public, will ensure that knowledge culture is alive on campus.

Researchers, visiting scientists, lecturers, students and residents of Bahrenfeld will equally benefit from a new quality of life and the wide range of facilities available on campus. New urban developments and open spaces incorporating existing buildings will offer new opportunities to make the campus accessible and easily reachable by people in the neighbourhood and will present new perspectives.

The DESY research site will be accentuated by a circular tree-lined avenue – DESY's PETRA Ring – providing a new continuous route leading from the campus to Lise Meitner Park via the green axis of the Second Green Belt to Volkspark. The main entrance areas to the DESY premises will be upgraded by attractive squares. There will be a reception area at the Notkestraße entrance and a new landmark further east – DESY tower. DESY's public facilities in the east, the new university buildings and the common areas of the eastern campus will be in the immediate vicinity of DESY's PETRA Ring. Major facilities around the public square will be at the core of Campus East, thereby extending the Luruper Chaussee entrance – a education and conference area, learning centre and refectory as well as local district facilities. From there Volkspark can be reached via Luruper Chaussee – an attractive bicycle and pedestrian bridge, the High Line, will connect the eastern and western campus areas.

The Incubator – an innovation centre for new technologies and start-ups on Luruper Chaussee, a prominent address – will be located at the upper walkway entrance on north Stadion Street.

Luruper Chaussee will be the backbone of the two campus areas East and West, an interface to Volkspark – and a Knowledge Boulevard. Science buildings will line either side of the arterial road and benefit from this prominent address. Rows of trees, entrances to the Dahlia Garden, spacious squares and a lecture hall, public transport facilities, sports centres, innovative small businesses, shops and restaurants on the ground floor will upgrade and turn the arterial road into an urban promenade. This is where the drivers of the district's new urban centre will be gathered. Ebertplatz, the starting point to Knowledge Boulevard, will be enhanced by special architecture as a visible sign of science and research.

One thing for sure: only an intelligent mobility system can make Science City and campus facilities livable and sustainable. A possible new rapid transit railway link at Luruper Chaussee and modern mobility hubs as well as innovative transport concepts on campus, such as a bus shuttle system, will reduce the number of cars. Attractive bicycle lanes and car-free zones will support the "campus on foot!" goal.

Lively ambience at the learning centre of the University of Hamburg (image 02)

Learning centre of the University of Hamburg and bistro pavilion (image 03)

Open, transparent and mixed-use areas for research and science, which can be used by both science and the public, will ensure that knowledge culture is alive on campus.

Working conditions – research and quality of life at the University of Hamburg's Campus West (image 04)

Researchers, visiting scientists, lecturers, students and residents of Bahrenfeld will equally benefit from a new quality of life and the wide range of facilities available on campus.

Public area at the DESY research centre (image 05)

Campus axis West (image 06)

FOCUS AREA 02
RESEARCHING, STUDYING, LIVING AND WORKING AT VOLKSPARK

The new Hamburg model of a mixed-use neighbourhood combines the different residential and working areas of scientists and residents in Bahrenfeld. The residential area will be next to Volkspark and close to the lively Luruper Chaussee Knowledge Boulevard.

Detail of plan, Focus Area 02 (images 07–10)

New apartments suiting different lifestyles and needs will be built on the site of the former trotting course and in adjacent areas: students, scientists, visiting scientists and residents will form a close and lively neighbourhood.

The underlying idea is to ensure a strong blend of work, research and residential features coupled with open spaces. A mixed and lively neighbourhood can evolve right from the start by combining scientific institutes and the university with diverse residential areas for the residents of Bahrenfeld. Schools and daycare centres, shopping facilities and public transport on Luruper Chaussee will meet demand and create urban quality of life.

The urban development clearly shows that the city ends at Luruper Chaussee and Volkspark. The protruding and receding facades of apartment blocks adorned by green balconies create a multi-faceted picture. The various types of apartments are of different height and accommodate different life styles under one roof. Warm, organic building materials, such as wood, ensure a pleasant ambience in the residential areas.

Starting at Luruper Chaussee there are wide-open, courtyard-like squares and green spaces forming fluid passageways to Volkspark. These spacious open areas can be used by residents and scientists and are major communal areas. Leisure, sports and recreational activities are possible right in front of this new residential area – housing and science will equally benefit from its favourable location by the park and the direct connection to Parklane. To the south of this new living and working area by the park an existing school will be extended and a new one integrated.

Campus East: diverse social life in the neighbourhood (image 07)

Luruper Chaussee Knowledge Boulevard (image 08)

A possible new rapid transit railway link at Luruper Chaussee and modern mobility hubs as well as innovative transport concepts on campus, such as a bus shuttle system, will reduce the number of cars.

Bridge across Knowledge Boulevard (image 09)

Science City Bahrenfeld is a significant future-oriented urban development project of the city of Hamburg bringing together universities, research institutes, residents and innovative business enterprises. A mixed-use, modern neighbourhood with around 2,500 apartments and excellent scientific facilities in the immediate vicinity of Volkspark, Hamburg's largest park.

Dr. Dorothee Stapelfeldt, Senator, Ministry of Urban Development and Housing

Working and living in the new residential area at Volkspark (image 10)

FOCUS AREA 03
ALTONA RESEARCH AND INNOVATION PARK

Start-ups and innovative companies with an affinity for research will move to the planned Altona Innovation Park east of Luruper Chaussee in the north to jointly research new technologies and innovations with scientists.

Plan detail, Focus Area 03

New technologies and knowledge transfer are key resources for business start-ups and economic development. The spatial linkage of science and industry, research and application will be alive on Vorhornweg. Located in the immediate vicinity of the key players DESY, the University of Hamburg and other scientific institutes, the Technology Centre on Vorhornweg will provide new facilities for innovative start-ups as well as for young and established companies. Basic research, applied research and the development of market-ready products are linked in a unique way by the Innovation Park ecosystem, Research Campus and European XFEL.

The incubator on the DESY site will support the potential for this development and networking and will guide start-up initiatives to market maturity. The additional technology and start-up centre planned will focus on start-ups and innovation topics in the high-tech areas of biotechnology and nanotechnology as well as on research into new, intelligent materials. The main focus of the entire site is directed at the research and development work by the key institutes on life science, nanotechnology, laser technology and material science, including highly-specialised infrastructure.

New forms of work will be the norm at Altona Innovation Park on Vorhornweg where buildings and rooms are equipped with flex spaces, co-working spaces, communal rooms and high-class laboratories. Apart from the interior green communal areas inviting to interaction and exchange on campus, scientists and researchers will benefit from a wide range of recreational and leisure activities available in the adjacent Volkspark.

As some buildings of the Innovation Park will be located at Luruper Chaussee, the Innovation Park will not only have a prominent address but will also be connected to key areas of the research campus located along this arterial road.

Aerial view, Altona Research and Innovation Park

OUTLOOK

SCIENCE CITY BAHRENFELD IS IN THE MAKING

Scientific excellence of international acclaim and local urban development will merge and form a culture. The future plans presented in this brochure serve as a navigation system. This process and the relevant debates are now starting and will be continued. The spotlight is now on the joint activities of the residents of Bahrenfeld, politics, science, companies and the administration who are all involved in Science City.

THE ROAD TO SCIENCE CITY

The concept of Science City Bahrenfeld with its vision for 2040 definitely kicks-off the integration of research, science and education into the new and existing suburban structures in the district of Bahrenfeld. It is considered to be the beginning of a process that has to be further developed in the years and decades ahead.

In view of the common goal to establish Science City Bahrenfeld and integrate it into the district it is possible to continue the constructive exchanges, dialogues and debates. Important institutions, companies, authorities, residents and the general public must be part of this process. The developments presented in this brochure and in the vision serve as a navigation system with the relevant visions for the future of an urban science district. Ultimately, this vision must be no less than a framework for the future that always has to be measured against what has actually been achieved.

Three major topics are combined in the vision of Science City Bahrenfeld: DESY, the University of Hamburg and the development of the former Bahrenfeld trotting course. Volkspark, the "green lung" of science and research (Science City) with its open spaces, recreational and sports facilities is at the centre of a larger area.

The urban development of Volkspark will start in the north with the Altona Technology and Innovation Park. The area of the adjacent trotting course south of the School Garden will feature a mix of residential, work, research, educational and study areas. To the west of Luruper Chaussee an urban complex with modern research facilities, educational and work areas ensuring a high quality of life will be built. In principle, the aim is to also provide the district with a new social infrastructure and to supplement and qualify existing institutions. The unique opportunities and potentials presented by the development of university buildings, schools and other facilities must be seized to enhance the urban quality of life.

Franz-Josef Höing,
Chief Planning Officer
Ministry of Urban Development and Housing

Aerial view, Knowledge Boulevard

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