

## 06.07 Urban Structure

# 06.08 Urban Structure – Area Types Differentiated (2016 Edition)

### Overview

The effects of urban development upon the environment depend to a particular degree on the type and intensity of human use. For this reason, the effects on the environment are closely linked to uses and building structures.

In the course of the urban development of Berlin, a multifaceted structure of buildings and open spaces has emerged. In Map Urban Structure – Area Types Differentiated (06.08), 52 area types are defined and described on the basis of their typical use, the time of their emergence and their structure of buildings and open spaces. For better readability, they have been grouped into 16 urban structure types and body of water in Map 06.07.

The **area types** serve the purpose of further differentiating the use of the built-up areas (WOZ, cf. description of Maps Actual Use of Built-Up Areas (06.01) and Green and Open Spaces (06.02)). Especially for the use type “residential”, further differentiation is required. On the one hand, areas with residential use account for more than half of the city’s built-up area, and for more than one quarter of the entire area of Berlin, so that they assume a special position; on the other, the spectrum covers a broad range of other uses in residential areas which are of particular interest, since the various urban development and environmental indicators and key quanta are highly dependent on urban structure. Here, structural age, height, density, and arrangement of the buildings in relation to one another, as well as the characteristic structure of the open spaces, are particularly important.

In contrast, the types of green and open spaces largely correspond to the uses of green and open spaces (GRZ cf. description of Map Inventory of Green and Open Spaces (06.02)) or even combines them.

Knowledge of these various structural types, in connection with the actual use mapping in Maps 06.01 and 06.02 of the Environmental Atlas, constitute an essential foundation for the urban development and landscape planning investigations and development projects, both at the superordinate and the local levels. With the aid of these maps, it is also possible to derive information regarding the nature of biotope and vegetation structures, the climate situation, the consistency of the soil, the intensity of imperviousness, or the formation of new groundwater.

In terms of spatial and functional differentiation, these maps are of fundamental importance, especially for city-wide analyses, models, programmes and planning in the environmental area. Since not all data required for certain calculations or planning are available or can be collected with reasonable effort locally, literature values are assigned to mapping units by means of random sample mapping on site, or parameters or indicators that are obtained through expert estimates. Based on the comprehensive maps on use and urban structure available, these can then be transferred to the entire city for many applications with a sufficient degree of accuracy.

### Development of the Urban Settlement of Berlin

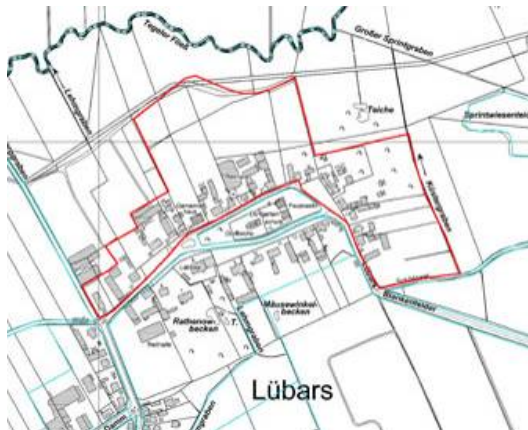
Both the natural landscape and the development of urban settlement have made their mark on the urban structure of Berlin. Some remainders of the agriculturally used land, as well as landscapes characterized by water and forest, have to this day remained free of development: the forests in south-eastern Berlin between the Spree and Dahme, and, in the West, along the Havel, and also some large contiguous agricultural areas in the north-eastern part of the city. Only a few of the once numerous creeks, ditches, ponds and wetlands are still present.

#### After 1880: The Wilhelminian period

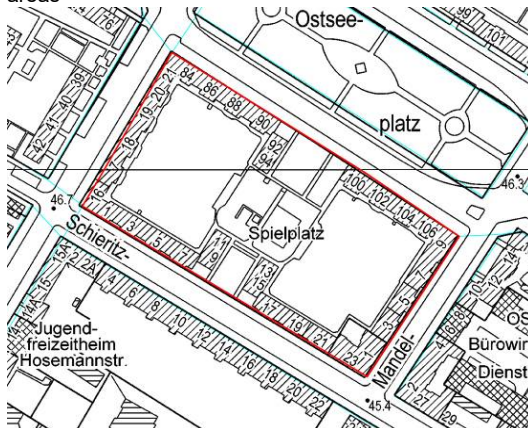
The appearance of Berlin changed most markedly at the end of the previous century, as the city developed into an industrial centre. With increasing job opportunities, many people moved to Berlin, and

a growing need for housing was the result. The building activity was regulated by development plans and building codes, in which the street edge lines, the sizes of the blocks, the minimum sizes of courtyards, and the heights of buildings were stipulated. Thus, Berlin's typical dense **block development** with its narrow, sometimes connected courtyards emerged between 1880 and 1918 within the City Rail Circle Line. This building design was structured by scattered decorative squares and parks, and by cemeteries.

In the then-suburbs (such as Friedenau) the building code of 1892 permitted a lesser degree of property utilization than in the inner city. In these areas, lower and somewhat more generously-dimensioned block developments emerged, with decorative features and a garden-courtyard structure, as well as villa development.



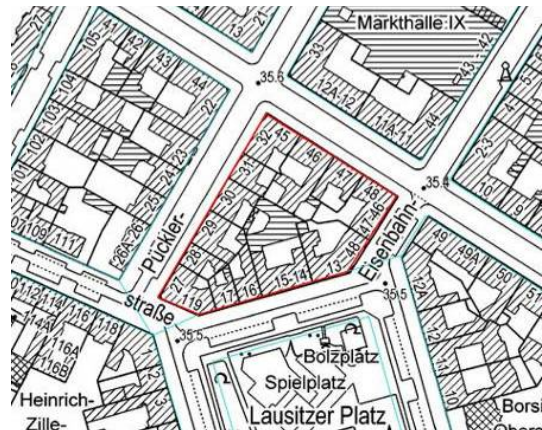
Village-like mixed development in old village core areas



Block-edge development with large quadrangles (1920s-1940s), 3-5-storey



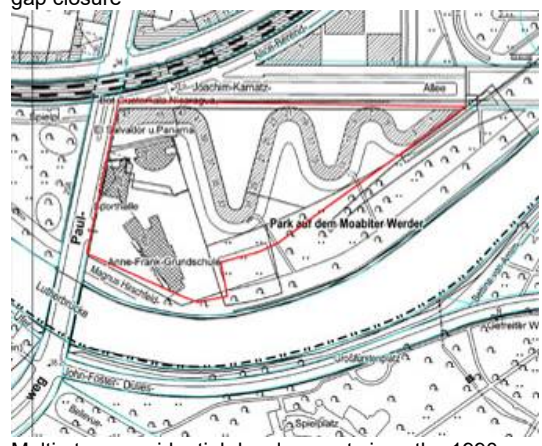
Large estates with tower high-rise buildings (1960s-1990s), 4-11-storey and more



Dense block development, closed rear courtyard (1870s-1918), 5-6-storey



Heterogeneous inner-city mixed development, post-war gap closure



Multi-storey residential development since the 1990s

Fig. 1: Several urban structural types from various phases of Berlin's urban development

## After 1918: Greater Berlin

New designs developed extensively only after 1918, when the construction of wings and rear buildings was forbidden by law. At the same time, public housing construction companies took over the role of the main actors in the area of residential construction from private builders. They replaced the until-then prevalent lot-by-lot development with the construction of larger, coherent estates outside the Circle Line, in what was then the outskirts of Berlin. This development was favoured by the incorporation into Berlin of its surrounding communities in 1920, to form Greater Berlin, which made uniform planning possible. Also, the open spaces associated with housing developments were accorded greater significance, which was manifested in the greater size, usefulness and design of these open spaces, but also in the designing of public open space. Later, the large public parks and allotment garden facilities emerged, which extended in a ring shape around the turn-of-the-century inner-city core. Some estates, such as the "Uncle Tom Estate" in Zehlendorf, continued to bear witness to the previous rural character of the area, with their woods and orchards.

## After 1945: The divided city

Massive destruction during World War II and the political division of Berlin in 1948 influenced the further course of urban development. Some 30 % of all buildings had been totally destroyed or severely damaged.

Destruction of almost the same proportion – often with destructive effects on the historical plan of the city and on its structural substance – ensued in both parts of the city during the following decades, with the often radical implementation of such plans as the "automobile-appropriate city" and "socialist urban development".

The **western part of Berlin** received economic aid under the Reconstruction Programme (Marshall Plan). So that the war-time destruction could be removed continuously by large-scale building activity during the '50s and '60s. In the inner city, vacant lots caused by the war were closed, and whole blocks were reshaped by large-scale reconstruction and by de-coring, coupled with demolition and the construction of new buildings. The developmental goals at that time were relief of the density of inner-city development, the dispersion of municipal functions and the creation of wide thoroughfares for motorized private transport. In the outskirts, large new self-contained estates emerged with relatively high shares of open space, and with industrial areas on former open spaces between old village cores. Starting in the late '70s, construction policy began to be concentrated on the revival of the inner city. Building activity was essentially limited to smaller vacant lots all over West Berlin, and on the preservation-oriented reconstruction of existing structures.

In the **eastern part of Berlin**, which did not receive economic support initially, but was in fact instead burdened by reparations, reconstruction began on a large scale only after construction of the Wall in 1961 and with the industrialization of the East Berlin construction industry. The emphasis during the '60s was on the new formation of the centre of the city on areas wiped out and cleared as the result of the war. At that time, the plan was not to reconstruct the pre-war building stock as the inheritance of capitalism, but to tear down the remains in further sections and to replace them with developments built in the socialist architectural style. Relatively little new living space was created during the '50s and '60s. In 1971 therefore, the housing programme was proclaimed as the main focus of the social programme. Large residential areas were created in the centre of East Berlin and especially to a great extent on the outskirts of the city in Marzahn, Hohenschönhausen, Lichtenberg and later in Hellersdorf by means of industrial prefabrication. In part of this, new allotment garden areas were also created on the outskirts of Berlin. Only later was the existing old building stock recognized as living space worthy of preservation; but hardly any funds were available for its reconstruction.

## After 1989: The reunited city

By 1992, all the concrete-plate residential estates still under construction in the eastern part of the city had been completed. In the western part, only insignificant amounts of additional construction were carried out during this period. From 1993 to 1997, construction activity involved on the one hand new suburbs at the outskirts, such as Karow-Nord, built on former farmland, and on the other, numerous major projects, such as around Potsdamer Platz complex in the following years. Moreover, both numerous government buildings were created as part of the urban development programme "Capital City Berlin - Parliament and Government District" and open spaces and memorials. Simultaneously, other urban development projects on extensive conversion spaces (predominantly areas with commercial, industrial, military and police use), such as Johannistal/Adlershof or in the Rummelsburger Bucht area, were planned and concepts were developed in order to promote the development of new urban neighbourhoods. In the mid-1990s, it became clear that the development boom expected for



Berlin would fail to appear. Migration to the surrounding areas became the dominant demographic factor. The housing market eased and the first office and commercial buildings became vacant. Due to these changed business conditions and unfavourable development policies, the original planning goals were modified, and the structural dimensions considerably reduced. For example, the Wasserstadt Berlin-Oberhavel development programme in Spandau was cancelled in 2006 and construction projects were stopped. Less massive building typologies were devised and implemented for areas that were not yet developed in the Rummelsburger Bucht development area.

Since 1997, **new housing construction** has been declining in Berlin-, and by 2000 had dropped back to the level of 1991, due to the reduction of subsidies. Subsequently, residential development stagnated at a low level up until approx. 2011. In place of major construction projects, this time saw the closing of scattered gaps, the expansion of existing structures, and the densification of already developed areas, especially in the inner city. This involved primarily buildings with large condominiums, as well as single-family homes and duplexes. New housing construction was largely concentrated in the boroughs and districts of Spandau, Weißensee, Pankow, Treptow, Köpenick, Marzahn and Hellersdorf, where densification was carried out in existing loosely built estates (cf. [FNP Report 2015](#) (only in German)). Moreover, large parts of the city centre with old buildings, especially in the eastern part of the city, have been reconstructed with the aid of various urban reconstruction and urban renewal subsidy programmes, which has involved both the building structures and the residential environment. The same is true for the great majority of the concrete plate-type estates. In recent years, new housing construction has picked up significantly, due to the rapidly growing population. New residential neighbourhoods of varying typology and density are currently being created on conversion areas, on outdoor spaces and, particularly, on numerous urban fallow areas.

The last 10 to 15 years have also seen a strong increase in the number of hall-like (large-scale) **commercial** buildings, including the associated access facilities and parking spaces for motor vehicles.

**Open spaces** along the old Berlin Wall corridor, and abandoned railway grounds which, in the course of the decades of the division of the city, have in some cases developed into valuable segments of the natural habitat and open space system, have since reunification in some cases been reshaped as urban parks or memorial areas; or they could be secured as near-natural areas, and as new typical parts of Berlin, they contribute to the diverse structure of open spaces of the city (e.g. the North Station, Gleisdreieck, the Berlin Wall Park, the Bernauer Straße Berlin Wall Memorial, Südgelände, Biesenhorster Sand). As part of urban development projects, completely new public green spaces were also created, which were oftentimes designed as landscape parks, and which meanwhile do not only serve the purpose of recreation but are increasingly taking on tasks and functions of nature and landscape protection as well.

## Statistical Base

The Environmental Atlas Maps Actual Use of Built-Up Areas (06.01), and Green and Open Spaces (06.02), were compiled parallel to Maps 06.07 and 06.08. In the course of the updating process for the 2016 Edition (as of December 12, 2015), changes in land use from 2011 to 2015 were ascertained. An update of the geometry of Block Map 1:5,000 (ISU5) was undertaken, and accordingly adapted to the urban structure maps. Moreover, the data base for actual use and structure mapping was subjected to an automated plausibility check on the basis of various geo-data available in the State of Berlin.

Overall, the following statistical bases were used to update and check the actual use and urban structure maps:

- Block Map of the Urban and Environmental Information System (ISU5/50), as of December 31, 2015
- Data from the Senate Department for Urban Development and Environment:
  - Automated Property Register (ALK), as of September 2010
  - Biotope mapping, as of 2014
  - Digital ortho-photos, aerial photography flights 2010 through 2015
  - Area monitoring, as of September 2015
  - Forest management data, Berlin Forests, as of October 2014
  - Cemetery inventory, as of December 2009

- Building and vegetation heights, aerial photography data from August 2009 and September 2010 (cf. Environmental Atlas 06.10)
  - Green space inventory, as of February 2016
  - Map of Berlin 1:5,000 (K5), survey departments of the boroughs, as of April 2015
  - Allotment Gardens Inventory, as of May 2015
  - Peatland areas from the Project “Berlin's Peatlands and Climate Change” of the Humboldt University of Berlin, Soil Science and Site Science Division, as of May 2015 (cf. Environmental Atlas 01.19)
  - Social infrastructure sites – day care centres, Planning-area Related Information System for Monitoring and Analysis - PRISMA, as of June 2014
  - Impervious soil coverage, as of May 2011 (cf. Environmental Atlas 01.02)
  - Urban structural density, Site Occupancy Index (SOI).
- Data from external sources
    - Building completions of the years 2011-2014, Statistical Office for Berlin-Brandenburg, as of June 2015
    - Soil-scientific mappings, compiled in the years 2010-2015
    - Building count of the 2011 census, Statistical Office for Berlin-Brandenburg, as of March 2014
    - Legally registered inhabitants at the primary place of residence in Berlin, Statistical Office for Berlin-Brandenburg, as of December 31, 2015
    - Statistical blocks, Statistical Office for Berlin-Brandenburg, as of December 31, 2015
    - Digital field block register, agricultural reference plots, Ministry of Rural Development, Environment and Agriculture Brandenburg, as of February 2016
    - HistoMap Berlin, State Archive Berlin and Beuth University of Applied Sciences Berlin, as of 2013
    - Social infrastructure sites – hospitals, State Office for Health and Social Affairs (Landesamt für Gesundheit und Soziales, LaGeSo), as of June 2014

## Methodology

The maps of both the urban structure mapping system and those of the actual use mapping system used the block maps of the City and Environment Information System (ISU) as the spatial reference system, and have been updated together. The updated area types were assigned retrospectively to the block sections and block segments shown in the use maps, i.e. sections were not divided based on different area types.

For areas assigned both to the Map Actual Use of Built-Up Areas (06.01) and to Map Green and Open Spaces (06.02) (**dual use**) the area type is oriented toward the structural use. An exception here is sports use, which is counted as green and open space use, and is always categorized as dual use together with Public facilities/special use. In type categorization, covered and uncovered sports facilities are distinguished, with the latter assigned to the group Open space use area types.

### Updating of the geometry and the use data

The updating of the urban structure mapping system is carried out parallel to the revision of the actual use maps of the Environmental Atlas ([Actual Use of Built-Up Areas \(06.01\)](#) and [Green and Open Spaces \(06.02\)](#)).

In addition to the main emphasis update, which is carried out regularly at five-year intervals, the revision for the **2016 Edition** focussed on land use and area type checks of the entire database, based on geo-data available in the State of Berlin. Moreover, the admissibility of combinations of various land uses and area types was checked for the entire database.

## Plausibility checks

Comprehensive plausibility checks were carried out. They consisted of a database analysis, under which areas with non-admissible combinations of uses and area types were ascertained and examined, and of an evaluation of various geo-data stocks which have been compiled in recent years at the Senate Department for Urban Development and the Environment and other institutions for various purposes. These data stocks were either already available as block data of the ISU, or else could be merged and compared with the data of the ISU maps, thus providing possibilities which permitted particular cases of use information to be re-examined. For instance, based on existing data on the Site Occupancy Index (SOI), the assignment of the blocks of the area types Commercial/industrial areas with dense or sparse construction could be examined. The SOI indicates the built-up proportion (cf. §19 Sect. 1 Land Use Ordinance (BauNVO)). For this reason, commercial and industrial areas were checked to make sure that their SOI was greater or less than 0.5 (i.e., over-development of more or less than 50%), respectively, in accordance with their classification as dense or sparse construction.

In the current revision, 7,159 areas of the total of 25,352 contained in the ISU5 block map were checked. Of these, 1,945 areas were assigned to a new use category, and as a result, to a new area type.

In total, 1,346 blocks were assigned a new key, 147 block segments were deleted.

## Map Description

### Description of mapping units

The 52 different area types which are available as mapping units for the urban structure are categorized into six groups. This is designed to facilitate a logical assignment of types to the various uses, to support the mapping process. For example, block sections with residential use can only be assigned to area types belonging to the groups “Dense residential development” and “Low-density residential development”. In Map Urban Structure (06.07), similar area types are grouped into 16 **overarching structure types**, as well as body of water (which cannot be assigned a “classic” structure type), for better readability. The **definition and description of area types** can also be seen in the report on the [documentation of mapping units and updating of the database 2015](#) (German pdf; 7.6 MB).

### Area types of the “Dense residential development” group

| Group I | High-density residential areas   |
|---------|--|
| TYPE 1  | Dense block development, closed rear courtyard (1870s - 1918), 5 - 6-storey                      |
| TYPE 2  | Closed block development, rear courtyard (1870s - 1918), 5-storey                                |
| TYPE 3  | Closed and semi-open block development, decorative and garden courtyard (1870s - 1918), 4-storey |
| TYPE 6  | Mixed development, semi-open and open shed courtyard, 2 - 4-storey                               |
| TYPE 10 | Block-edge development with large quadrangles (1920s - 1940s), 2 - 5-storey                      |
| TYPE 72 | Parallel row buildings with architectural green strips (1920 - 1930s), 2-5-storey                |
| TYPE 8  | Heterogeneous inner-city mixed development, post-war gap closure                                 |
| TYPE 7  | De-cored block-edge development, post-war gap closure  |
| TYPE 73 | Rental-flat buildings of the 1990s and later   |
| TYPE 9  | Large estate with tower high-rise buildings (1960s - 1980), 4 - 11-storey and more               |
| TYPE 11 | Free row development, landscaped residential greenery (1950s - 1970s), 2 - 6-storey              |

*Tab. 1: Area types of the “Dense residential development” group*

Area type 1 “**Dense block development, closed rear courtyard (1870s-1918), 5-6-storey**” emerged during the Wilhelminian period (1870-1918) in order to maximize land utilization for residential purposes. It is largely found inside the city rail (S-Bahn) Circle Line, and is characterized by close blocks of 5-6 storey buildings. Often, there are still several courtyards, usually entirely surrounded by buildings and connected with one another only by passageways; some of these courtyards are only the size of a light shaft. Sometimes, the courtyards are commercially used; usually however, they merely serve the purpose of access to the wings and rear buildings, and as placement for rubbish bins or bicycles. Not

only in the case of commercial utilization, are these courtyards virtually completely impervious. This area type is thus the most densely built-up and also the most impervious type of residential area.

Area type 2 **“Closed block development, rear courtyard (1870s-1918), 5-6-storey”** designates blocks with primarily closed 5-storey block construction, also built during the same period, also within the Circle Line, for the rapidly growing population of Berlin. The blocks consist largely of old buildings with wings and/or parallel rear buildings. In addition, there are also commercial and industrial buildings, public facilities buildings and restored or new buildings at the block-edges. The courtyards are encompassed by high buildings on several sides, but only rarely on all sides. There are often separated from neighbouring courtyards by walls or fences, so that they together constitute angled interior block spaces. Often, courtyard areas have been connected with one another in the context of renovation measures by means of partial demolitions, and are now used as comprehensive areas for such public facilities as childcare centres etc.

This area type is characterized by considerable mixture of residential areas and workplaces. It also includes larger commercial operations which require large non-built-up spaces for storage purposes, deliveries, car parks etc.

This category has a somewhat lesser degree of density and impermeability than the area type “Dense block development”. In better neighbourhoods, the courtyards often have old trees, paved walkways and decorative flower beds. In residential areas with a lesser degree of renovation, the share of completely impervious and minimally green courtyards is higher.

Area type 3 **“Closed and semi-open block development, decorative and garden courtyard (1870s-1918), 4-storey”**, is characterized by 4-storey block construction, often with front yards. The blocks with decorative and garden courtyards were often built during the Wilhelminian period (1870s-1918) in the then-suburbs of Berlin outside the Circle Line (today’s edge of the inner city). These buildings have only wings or only parallel rear buildings, but generally not both. They are characterized by a much sunnier interior block space than is the case for the above two area types; it is usually designed as a garden.

Area type 6 **“Mixed development, semi-open and open shed courtyard, 2-4-storey”** is characterized by open mixed structures, particularly at the edge of the inner city and at the edge of the city, and is there especially associated with the old village cores and sub-centres. There are some remains of old structures which were there before 1870, sometimes low, old buildings, sheds and workshops in the courtyards, and these areas are also interspersed with buildings associated with the 4-storey construction of the “decorative and garden courtyard” type, as well as new buildings – both single-family and multifamily houses, and rental-flat buildings – built after 1945. Accordingly, the appearance of these areas is fairly heterogeneous. Their characteristic feature is interior block spaces broken down into small parts, often with commercially used workshops and storage areas and parking spaces, but also some privately used vegetable gardens and orchards.

Area type 10 **“Block-edge development with large quadrangles (1920-1940s), 2-5-storey”** designates the type of block-edge construction with large residential inner quadrangles, which was typical for the period from the late 1920s to the mid-1940s.

The large quadrangles were formed by the complete or near-complete enclosure by 2 or 5-storey buildings directly on the street line. They were associated with more or less representatively designed entry areas, and sometimes semi-public passageways connecting the quadrangles with the streets. The large quadrangles are almost entirely green, and are characterized by an architecturally symmetrical design. In some early estates, the quadrangle was apportioned into residents’ gardens surrounded by hedges. Otherwise, the predominant form was an open space design with lawns and scattered old trees. Particularly characteristic were such “informal” species (birch or willow), which contrasted with the symmetrically arranged, “architecturally-shaped” trees (Lombardy poplar and spruce). Access paths were generally sparingly designed; however, parking garages were in some cases added later.

Area type 72 **“Parallel row buildings with architectural green strips (1920s-1930s), 2-5-storey”** describes the row housing of the 1920s and 1930s. During the late 1920s and in the 1930s, the first row houses were built in Berlin. The main purpose was to achieve optimum utilization of the lots, and to provide much light, air and sun to all the residences. The long rows of 2-5 storey houses were arranged parallel to one another. The free space between the houses was narrow and elongated, and open on the short sides.

The row houses give the streets a spatial closure, since they were not detached in the middle of the lots, as would be common after the 1950s. Rather, they were uniformly arranged at right angles to the street, so that their narrow edges together formed the building line. In some cases, terminal lateral buildings were arranged parallel to the street, so that a mixture of row and block-edge construction emerged, resulting in variegated exterior spaces. Passageways, vistas and jutties were used to visually

break up the appearance of these streets. Moreover, the street space was varied by placing the buildings in front of or behind the building line, and with local extensions. Front yards were almost always provided.

Area type 8 **“Heterogeneous inner-city mixed development, post-war gap closure”** is also located within the residential neighbourhoods built during the Wilhelminian period. Here, unlike the previous area types, high-rise buildings with rental flats and offices were often built as rows or single towers in the block sections, often with no regard for the historic building lines or building heights of those streets. Remnants of Wilhelminian-period buildings are only sporadically present. The blocks have neither block interior spaces nor closed semiprivate courtyard areas. The non-enclosed open areas serve as car parks in the form of underground or surface parking. The other open areas are largely designed as non-usable green fringe.

Area type 7 **“De-cored block-edge development, post-war gap closure”** is scattered throughout the Wilhelminian-period residential neighbourhoods in the inner-city and the inner-city edge. The old buildings destroyed in the Second World War were replaced by the reconstruction of those buildings, or by new buildings in the gaps. Generally, the new buildings were placed along the same building lines as the old ones, so that this area type is largely characterized by closed block-edge construction, which is however sometimes interrupted by driveways, car parks, gaps, etc.

In the context of modernization with the new construction of front buildings, it was not uncommon for all lateral and rear buildings, as well as sheds, to be torn down. The result was a block interior area that was more open than the original structure; generally, it is subdivided at the lot boundaries by fences. In addition to the old structuring of the courtyards, these areas are often dominated by car parks surrounded by green space, such as lawns and bushes. In some cases, however, relatively large interior spaces were created, which have been designed as leisure spaces for the inhabitants, with green spaces and lawns, playgrounds and benches, or with such public facilities as childcare centres.

Area type 73 **“Rental-flat buildings of the 1990s and later”** includes those areas built since the beginning of the 1990s, which are considerably different from the typical large estates (cf. area type 9 **“Large estate with tower high-rise buildings (1960s-1990s)”**), and include a wide range of urban development structures, e.g. block-edge, row houses, town villas and townhouses. For the most part, these are major residential development projects of the 1990s and the first years of the 21<sup>st</sup> century, which have been carried out in the context of major urban development measures (Wasserstadt Berlin-Oberhavel, Rummelsburger Bucht) and other large projects (Karlshagen-Nord, Buchholz etc.). By contrast, single-family housing areas, row house and duplex estates built during the 1990s and later are assigned to the area types with unspecified building age (area types 22 **“Row houses and duplex with yards”** and 23 **“Detached single-family homes with yards”**).

Open spaces and interior courtyard areas of the estates built since the 1990s are often designed as semi-public green spaces with playgrounds and leisure areas; the ground-floor flats often have terraces or small garden areas. Car parking space is increasingly being provided in underground garages.

Moreover, the estates built since the 1990s have a relatively energy-saving, in some cases ecologically oriented type of construction, thanks to current standards (relatively good insulation, in some cases passive houses, rainwater seepage, greened roofs, etc.).

The buildings of area type 9 **“Large estate with tower high-rise buildings (1960s-1990s), 4-11-storey”** appeared between the late 1960s and the end of the 1990s. Often, these were comprehensive large-scale residential areas at the edge of the city (satellite towns), mostly built by concrete plate construction. Smaller estates with row or block development can be found in the sub-centres and in the inner-city area. In the eastern part of the city, concrete plate construction was sporadically used even within the historic structural area.

Typically, unlike the following area type 11 **“Free row development with landscaped residential greenery (1950s-1970s)”**, various building heights and designs were used within the same estate. Often, these were 4–8-storey, semi-open block-edge developments, or mixtures of block-edge and row developments, which were in some cases combined with single tower high-rises or high-rise chains of ten storeys or more. Especially in the major estates, the buildings were often placed with no reference whatever to the streets, so that there is no homogeneous spatial street structure.

Large, non-enclosed open spaces often exist between the buildings, surrounded by large numbers of surface car parks. The pervious surfaces are largely covered by lawns and shrubbery.

Area type 11 **“Free row development with landscaped residential greenery (1950s-1970s), 2-6-storey”** emerged during the post-war period, primarily during the '50s through the '70s, in the context of the reconstruction programmes. The elongated mostly 4-storey blocks of houses arranged in rows



were for the most part build as coherent estates in former residential areas badly destroyed in the war in the inner-city, and along the edges of the densely built-up areas at the inner-city edge.

Unlike the row housing of the '20s and '30s, the construction was no longer oriented directly toward the existing street grid. It is often oriented in an east-westerly direction, in order to provide more sunlight for the flats, but is no longer as strictly parallel as the rows built during the '20s and '30s. In the later years, the rows were often built in a staggered and shifted arrangement, or arbitrarily lined up along a curving pattern of streets. During the 1970s, designs in chain or spider-web form also emerged. By contrast with the area type "Large estate with tower high-rise buildings" each estate generally had uniform designs and heights.

### Area types of the "Low-density residential areas" group

| Group II | Low-density residential areas  |
|----------|--|
| TYPE 25  | Densification in single-family home area, mixed development with yard and semi-private greening (1870s to present) |
| TYPE 21  | Village-like mixed development   |
| TYPE 24  | Villas and town villas with park-like gardens (mostly 1870s - 1945)  |
| TYPE 22  | Row houses and duplex with yards   |
| TYPE 23  | Detached single-family homes with yards  |
| TYPE 59  | Weekend cottage and allotment-garden-type area   |

*Tab. 2: Area types of the "Low-density residential development" group*

Area type 25 "**Densification in single-family home areas, mixed development with yard and semi-private greening (1870s to present)**" developed from areas of the area types 23 "Detached single-family homes with yards" or area type 24 "Villas and town villas with park-like gardens". Since, especially in former West Berlin, there was not sufficient free construction land available, there was a tendency during the second half of the 20<sup>th</sup> century to tear down old villas and single-family homes and to replace them with newly built larger rental-flat or apartment buildings, or to divide the lots and to build more houses in the former park-like gardens. The generously dimensioned interior block sections are now interspersed with buildings.

The new buildings are in many cases multifamily houses or rental-flat buildings where there are no longer any yards, but rather only a semiprivate green strip surrounding the entire building. The imperviousness and structural coverage degree of this area type is accordingly higher than it is for the two area types 23 "Detached single-family homes with yards" and 24 "Villas and town villas with park-like gardens". This phenomenon is particularly notable in the south-western part of the city.

Area type 21 "**Village-like mixed development**" is located in the area of the old village cores and, due to more recent development, particularly that in the open spaces, can only be found outside of the Circle Line, and very rarely in completely preserved village structures (e.g. in Kladow, Marienfelde, Buchholz, or Heiligensee). The village buildings today consist of a mixture of new buildings and typical farmhouses, as well as the old buildings of the former village cores. The decisive factor is that the open space elements of the village, such as the old streets, the village green, the village pond, the manor park, the cemetery at the church, etc., are at least partially visible, and in the areas at the edge of the city are in some cases largely still preserved.

The typical old village buildings are 1-2-storey residential buildings along the streets with farm yards behind them, often enclosed by farmyard buildings of brick. Behind these are fruit and vegetable gardens. The low height of the buildings has been supplemented around the edges of the inner-city by single and multifamily homes. In addition to their residential function, the old village areas today function as local sub-centres, with shops, retail facilities, administrative centres, small workshops, riding stables, restaurants and garden cafés in the old farm buildings.

Area type 24 "**Villas and town villas with park-like gardens (mostly 1870s-1945)**" includes residential areas with villages and townhouses, largely from the Wilhelminian period through the end of the Second World War. Villas are representative single-family homes with yards. Town villas are similar to villas in design and overall appearance, but are multifamily houses with somewhat larger building volumes. Although they have the same use characteristics, these areas have larger lots and greater building volumes than those of the area type "Detached single-family homes with yards". These buildings have front yards of uniform width, along a single building line, and are relatively close together at the block-edges. They form easily recognizable interior block spaces. The lots are separated by hedges or walls, and in some cases by old brick buildings, which were previously sheds or washhouses. In the case of town villas, the interior block space is sometimes relatively small, due to the larger building volume. The park-like impression of these gardens is created by the old trees which are very large, and

in some cases exotic species. Sometimes the gardens include vegetable and flower beds; however, lawns with trees are dominant.

This area type rarely appears in pure form over an entire block, since the gaps caused by wartime damage have been filled by buildings of other styles. In addition, the pressure of change due to densification is great, due to the relatively large sizes of the plots in this area type (cf. also area type 25 “Densification in single-family home areas, mixed development with yards and semi-private greening (1870s to present)”).

Area type 22 **“Row houses and duplex with yards”** describes row house estates or closely arranged duplexes with more or less longitudinally extended yards.

Until 1945, the sizes of the garden plots were dimensioned so as to be able to provide subsistence in vegetables, potatoes and fruit, and permit holding of small animals and chickens. A certain share of vegetable and flower beds, fruit trees and bushes can still to some extent be seen in these old row yards, even to this day. Until 1945, these houses were always built around the block edges, so that the yards in the block interiors formed large continuous green spaces.

The modern row houses are usually no longer built along the block edges, but rather arranged along spur roads or access paths which lead into the interior of the block sections. As a result, there is no longer any common open interior block space, but rather only rows of individual gardens screened off from the neighbours. Since the 1990s, there has been a trend toward space-saving construction, with smaller lot sizes resulting in increased shares of built-up areas on the lots, so that the yards barely cover half the lot areas. The yards of the duplexes are somewhat larger than those of the row houses. This area type is nonetheless one of those with the highest shares of open space.

Area type 23 **“Detached single-family homes with yards”** includes on the one hand single family housing areas, in which the houses are mostly built along a single building line behind front yards of equal depth, and in which small, single multifamily houses with appropriate garden plots are integrated only sporadically. Behind the houses are the actual yards, which are today largely used for leisure activity or as decorative gardens, and only to a lesser degree as fruit and vegetable gardens. At the level of the entire block, this yard area constitutes a large free space which is however subdivided by fences and hedges.

On the other hand, this area type also includes residential areas characterized by often unplanned, non-homogeneous building designs with a mixture of 1 - 2-storey buildings including single-family homes, bungalows, workshops and garages of various ages.

Such open, usually unstructured residential areas are located in the outer areas of the city adjacent to the more densely built-up areas, and at the city edge. Often, the structural density of these areas has been increased by the construction of buildings on so-called “hammer lots” and later densification with multifamily houses and rental-flat buildings (cf. also area type 25 “Densification of single-family home areas, mixed development with yard and semi-private greening (1870s to present)”).

Area type 59 **“Weekend cottage and allotment-garden-type area”** includes all block sections which are shown on the actual use map as weekend cottage and allotment garden type use. Weekend cottages are, by definition, not permanently inhabited, and are largely for leisure use. By contrast with single-family home construction for residential use, these blocks generally have low building volumes and small-scale land parcels. Compared with allotment garden areas, these areas are, however, more densely built up, and the parcels tend to be larger.

### Area types of the “Commercial, service use, small business and industrial use” group

| Group III | Commercial, service uses, small business and industrial use            |
|-----------|--|
| TYPE 29   | Core area  |
| TYPE 31   | Commercial and industrial area, large-scale retail, dense development  |
| TYPE 38   | Non-residential mixed use area, dense development                      |
| TYPE 30   | Commercial and industrial area, large-scale retail, sparse development |
| TYPE 33   | Non-residential mixed use area, sparse development                     |
| TYPE 32   | Utility area   |

*Tab. 3: Area types of the “Commercial, service use, small business and industrial use” group*

Area type 29 **“Core area”** has all block sections assigned to it which are shown in the actual use map as core use areas. These are areas with high use intensity and density which are located exclusively in the central areas of the inner city and in the major borough centres. The core areas are of overarching significance for commerce, private and public services, as well as cultural and scientific institutions. Sometimes public facilities in the inner-city area, such as federal administrative buildings, embassies, etc., are assigned to this category.

Structurally, there are major differences between particular areas. The spectrum extends from Wilhelminian-period block construction to more recent high-rise construction. Generally, these areas are characterized by a high degree of urban density and of imperviousness.

Area type 31 **“Commercial and industrial area, large-scale retail, dense development”** describes areas with a corresponding use in which more than half of the area of the respective lot is built up and intensively used. Especially at the edge of the city, commercial and industrial areas have the typical structural design with large building cubatures. By contrast, the structural design in the inner-city areas, especially in small blocks, tends to include smaller structures adapted to the surroundings.

Area type 38 **“Non-residential mixed use area, dense development”** describes block sections with mixed use, in which more than half of the respective lot is built up, and the open spaces are almost entirely used as car parks or storage space. They are characterized by a mixture of residential and commercial use. The external appearance is largely marked by commercial use; the characteristics of residential use are little in evidence, so that the block cannot be assigned to any of the area types with residential character (see above, Group I).

This area type occurs mostly in inner-city densely built-up areas and in the centres of the outer areas of the city. It involves primarily multi-storey structures, often with storefronts and storage or manufacturing halls in the courtyards. The lot areas are more than half built-up.

Area type 30 **“Commercial and industrial area, large-scale retail, sparse development”** describes areas with a corresponding use in which one half or less of the respective lot is built up. The use of these large lot areas is here almost exclusively for the purposes of commercial production, the storage and shipment of goods, or as car and truck parks. There is virtually no residential use here.

Commercial areas with sparse development are increasingly located at the edge of the city, especially in areas with favourable traffic conditions, such as motorways, rail connections and waterways. There buildings are predominantly single-storey structures built during the post-war period, with generous surrounding spaces. In underused areas, these facilities are often interspersed with fallow areas. Generally, these areas have a lower level of imperviousness than the commercial and industrial areas with dense development.

Area type 33 **“Non-residential mixed use area, sparse development”** describes block sections with mixed use in which half or less of the respective lot is built-up. The commercial structures, which were only recently built, particularly in the outer city boroughs, consist primarily of single-storey halls and building complexes with large surrounding open spaces.

The commercially used areas involve primarily commercial operations with a high share of storage, shipment and car and truck parking (junkyards, dealers in building materials, shipping companies and retail businesses). They occupy a major part of the block section, so that the block cannot be assigned to any of the area types with residential character (see above, Group I). There are also large areas which are unused or only extensively used, on which spontaneous vegetation in varying phases of development is located (fallow area). Generally, these areas have a lower degree of imperviousness than the mixed areas with dense development.

Area type 32 **“Utility area”** includes all block sections shown in the actual use map as Utilities areas. This category includes areas with facilities of the technical infrastructure, including electricity, gas, water and district heat supply, as well as waste and sewage disposal.

### Area types of the "Traffic areas" group

| Group IV | Traffic areas  |
|----------|--|
| TYPE 92  | Railway station and railway ground, without track area |
| TYPE 99  | Track area   |
| TYPE 91  | Parking area   |
| TYPE 94  | Other traffic area                                     |
| TYPE 93  | Airport  |

**Tab. 4: Area types of the “Traffic areas” group**

Area type 92 **“Railway station and railway ground, without track area”** includes all railway facilities except for the tracks, such as e.g. surface railway stations, railway freight stations, workshop areas, etc. Railway areas are a special case in terms of segment formation. In order to reduce the formation of block segments to the necessary minimum, the possibility for assigning dual use is used very broadly in this case. Thus, areas of the categories “Forest”, “Park/green space”, “Urban square/ promenade”, “Allotment garden facility” and “Fallow area” which are contained in railway blocks together with railway facilities are mapped as dual use traffic areas with the corresponding green space category. If the area is used by the railway, the type assignment is carried out in accordance with the respective utilization by the railway; otherwise the area will be assigned to the area type “Other traffic area”.

Area type 99 **“Track area”** describes the track areas of the city railway and the long-distance railway, as well as those sections of the underground/subway running outside the tunnels in open cuts. The track course is thus shown in its entirety.

Area type 91 **“Parking area”** is only assigned for car parks, parking garage buildings and garage facilities which either occupy an entire statistical block, or which evidently are unconnected with the utilization in that block. For instance, the car parks in the areas of major estates do not constitute block segments, even if they exceed the ascertainment limit of 1 ha, since they are part of the specific structure of this residential use. However, if such car parks are located in a separate block, they will be assigned to the use category “Traffic space” and the area type “Parking area”. This procedure also applies to the car parks in the vicinity of Public facilities/special use areas, such as the Olympic Stadium and the Messe Berlin Fairgrounds. In addition, median strips used as car parks and scattered large car parks in the city area and in recreational areas are assigned to this type.

Area type 94 **“Other traffic area”** includes not only the operating facilities of the BVG and the Central Bus Station Berlin (ZOB), but also traffic islands (except those which are evidently car parks), green and fallow strips along traffic routes, and promenades. It also includes areas of the categories “Forest”, “Park/ green space”, “Urban square/ promenade”, “Allotment garden facility” and “Fallow area” within railway blocks which are not used by the railway. In the use map, they are shown as dual use traffic areas with the corresponding green space category.

Area type 93 **“Airport”** includes both the runways, airport buildings and access areas such as roads and car parks, and the extensive open spaces surrounding the runways of the airport, mapped as dual use traffic space and fallows.

#### **Area types of the “Public service and other special uses” group**

| <b>Group V</b> | <b>Public service and other special uses</b>              |
|----------------|---|
| TYPE 43        | Administrative  |
| TYPE 45        | Culture   |
| TYPE 41        | Security and order  |
| TYPE 12        | Old school (built before 1945)                            |
| TYPE 13        | New school (built after 1945)                             |
| TYPE 44        | University and research                                   |
| TYPE 47        | Children's day care centre                                |
| TYPE 51        | Other youth facility                                      |
| TYPE 58        | Camping ground  |
| TYPE 60        | Other and miscellaneous public facility/ special use area |
| TYPE 49        | Church  |
| TYPE 46        | Hospital  |
| TYPE 98        | Construction site   |

**Tab. 5: Area types of the “Public service and other special uses” group**

All block sections shown on the actual use map as Public service and other special use areas are assigned to one of the following area types:

Area type 43 **“Administrative”** is assigned to the locations of public administrative offices. These include e.g. the borough offices, the town halls, the job centres, the courts, Senate departments, and such federal facilities as the locations of the ministries and the Bundestag. By contrast, embassies are assigned to the category “Other and miscellaneous public facility/special use area” (type 60).

Area type 45 **“Culture”** includes city museums, theatres, operas, the Philharmonic, etc. It also includes large-scale memorial graves and monuments.



Area type 41 **“Security and order”** includes areas used by the police, the fire department, the prison system, the military etc.

Area type 12 **“Old school (built before 1945)”** describes the schools built before 1945, on relatively small lots in the neighbourhoods characterized by imperial-era block construction. Their structural style is similar to that of the Wilhelminian-period area types. The non-built-up areas are used as leisure courtyards with playgrounds, or, rarely, as sports facilities.

Area type 13 **“New school (built after 1945)”** describes the schools built since 1945. Particularly the school centres built during the 1970s have very large lots, the non-built-up areas of which are used as leisure courtyards, playgrounds, or sports facilities.

Both area types, New schools and Old schools, include exclusively general educational and vocational schools. The locations of music schools, horticultural schools, “people’s colleges”, etc., are assigned to area type 60 **“Other and miscellaneous public facilities/special use areas”**, since they do not have the buildings and open space structures typical of schools.

Area type 44 **“University and research”** includes primarily the universities and colleges, as well as their associated teaching and experimental fields with agricultural or horticultural character, which are shown in the use map as public facility/special use area with corresponding open space dual use.

Area type 47 **“Children’s day care centre”** covers larger childcare centres occupying entire blocks. Smaller institutions are generally mapped in combination with other public facilities, such as schools or as part of residential areas. The buildings built since the Second World War are usually 1-2 storeys high; in rare cases they have three or more storeys. The old buildings have been adapted to the building style of the surroundings. Childcare facilities have very high open space shares, which are often intensively designed and used as recreational and play areas.

Area type 51 **“Other youth facility”** includes larger youth facilities sites which cannot be assigned to any other category, e.g. youth clubs, youth recreational centres, youth training centres, children’s and young people’s homes, children’s and young people circuses, school country centres, traffic schools and youth hostels and youth guesthouses.

Area type 58 **“Camping ground”** includes tent grounds, camping grounds and permanent campgrounds with mobile shelters, but not purely caravan camping places with an impervious parking-area-like character. Built-up areas include infrastructural facilities, such as sanitary buildings, and shopping facilities or restaurants, but the share of built-up areas overall is relatively slight.

Area type 60 **“Other and miscellaneous public facilities and special use area”** includes all public facilities areas which, as a result of lack of information or due to the nature of the system described herein, cannot be assigned to any other common use or public facilities area type.

Area type 49 **“Church”** is assigned if a considerable portion of the area of a block is occupied by church buildings. They often occur in connection with city squares or cemeteries, and may be mapped accordingly, as dual use areas.

Area type 46 **“Hospital”** includes both the structural facilities and the sometimes very extensive external grounds of each such institution. The time of construction of the hospitals is spread throughout the various construction eras. The hospital facilities built in the early 20<sup>th</sup> century were in some cases built in pavilion style. The relatively large external areas were designed as parks, and include a large share of access facilities. In later years, the style of construction was abandoned in favour of the central main building. However, large park-like external areas are usually typical here, too.

Area type 98 **“Construction site”** includes all areas designated as construction sites on the actual use map. These are areas with typical construction site characteristics, generally with bare soil. Once the foundations and/or the first storeys of a new building can be recognized, the site will be reclassified in accordance with its planned utilization.

## Area types of the "Green and open spaces" group

| Group VI | Green and open spaces       |
|----------|-----------------------------|
| TYPE 54  | City square / promenade     |
| TYPE 17  | Sport facility, covered     |
| TYPE 16  | Sport facility, uncovered   |
| TYPE 36  | Tree nursery / horticulture |
| TYPE 37  | Allotment garden            |
| TYPE 53  | Park / green space          |
| TYPE 27  | Cemetery                    |
| TYPE 57  | Fallow area                 |
| TYPE 56  | Agriculture                 |
| TYPE 55  | Forest                      |
| TYPE 100 | Body of water               |

*Tab. 6: Area types of the "Green and open spaces" group*

Area type 54 "**City square / promenade**" includes all areas mapped for this use in the actual use map, provided they have not been assigned any dual use as Public facilities / special use or traffic areas. These are public spaces in the life of the city which serve as places of leisure and recreation, assembly, or markets, or else as transit areas for pedestrians and bicyclists closed to street traffic.

City squares and promenades generally have a higher degree of impermeability than do those of the area type "Park / green space".

Area type 17 "**Sports facility, covered**" includes sports facilities in which the share of covered sports facilities (halls) is dominant. These may include combinations of sports fields and sports halls, stadiums and multipurpose halls with a predominantly structural character, indoor swimming pools, riding halls and ice-skating rinks, as well as covered over water sports facilities.

Area type 16 "**Sports facility, uncovered**" includes major sports locations in which the share of uncovered – i.e. non-built-up – sports facilities dominates the appearance. The buildings belonging to the sports facilities, such as dressing rooms and equipment storage facilities, are also included. Uncovered sports facilities may include stadiums, single sports fields, with or without tracks, in some cases located on the grounds of schools, tennis courts, outdoor swimming pools, golf courses and facilities used for riding, shooting or water sports.

Area type 36 "**Tree nursery / horticulture**" is assigned only to those block sections which are shown with that use in the actual use map. These are areas with predominantly open land plantation. It includes not only the planning areas of private tree nurseries and horticultural businesses, but also the borough horticultural operations and the city horticultural vocational schools. Areas entirely inside halls, on the other hand, are counted as commercial and industrial use.

Area type 37 "**Allotment garden**" includes all areas mapped for this use in the actual use map, provided they have not been assigned any dual use as traffic areas. The assignment and area delineation of the allotment gardens is based on the catalogue of data of Berlin allotment garden facilities maintained by the respective Senate department, which lists the allotment gardens as per the Federal Allotment Garden Law.

Other areas with similar use characteristics are assigned in the actual use map to the use categories "Weekend cottage and allotment-garden-type use", and are therefore assigned to area type 59 "Weekend cottage and allotment-garden-type use" in the urban structure mapping system.

Area type 53 "**Park / green space**" includes only block sections which are also assigned to the category Parks/green spaces on the actual use map, provided they have not been assigned any dual use as public service and other special uses or as traffic areas. In addition to the public green spaces listed in the Register of Green Spaces, this category also includes other green areas, provided their appearance is similar to that of publicly accessible green spaces, and that they evidently enjoy regular horticultural care.

The extensive park and leisure facilities mapped in the actual use map as parks or green spaces, which are almost exclusively characterized by extensively cared-for or non-cared-for forests or meadow-like areas, may be assigned to the area types Fallows or Forests (e.g. Klein-Glienicke People's Park).

Area type 27 "**Cemetery**" includes all areas mapped for this use in the actual use map, provided they have not been assigned any dual use as Public facilities/special use areas. In addition to those areas

currently used for burials, these include former cemeteries, provided that their character as cemeteries is still recognizable.

Structurally, cemeteries vary primarily in terms of their stock of trees. While forests cemeteries and older park cemeteries are essentially characterized by their old tree stands, newer cemetery facilities may have almost no large trees.

Area type 57 “**Fallow area**” describes the usually no longer used areas on which a variegated array of vegetation, such as nutrient poor or dry meadows or ruderal fields may develop. All areas mapped under one of the fallow use categories are aggregated in this area type, unless they also have a structural use; in that case their type assignment is in accordance with that structural use. Moreover, certain facilities mapped under the use category “Park / green space” may be assigned to this area type if the area evidently is not being cared for, and is dominated by ruderal vegetation (e.g. Tegel Creek).

Area type 56 “**Agriculture**” is assigned to all block sections which are shown on the actual use map either as pastures/meadows or farmland, provided they have no dual use as public service and other special use areas. In that case, they would be assigned to one of the above area types (see above, area types of public service and other special uses).

Blocks with operational courtyards used by horticultural offices as well as certain research institutions such as the Institute for Crops Research and associated teaching and experimental fields of the universities are mapped as dual use public service and other special use areas, and are then not assigned to the area type “Tree nursery/ horticulture”, but rather to the area type group “Public service and other special uses” (see above).

Area type 55 “**Forest**” includes all areas mapped as the use category “Forest”, unless they at the same time have some structural use. In that case, the type assignment is in accordance with that structural use. In addition, some areas mapped in the use category “Park / green space” may be assigned to this area type, if they are predominantly extensively cared for areas planted with trees (e.g. Klein-Glienicke People’s Park).

Area type 100 “**Body of water**” is assigned to all block sections which are also shown as body of water in the actual use map. Body of water include not only natural waters, such as rivers and lakes, but also canals and the retention and seepage basins of the Berlin Waterworks, provided they are recognizable as water surfaces.

## Key characteristics of area types

A differentiated **definition and description of area types** can be found in the report on *Flächennutzung und Stadtstruktur – Dokumentation der Kartiereinheiten und der Aktualisierung des Datenbestandes 2015* (Land use and urban structure – Documentation of mapping units and updating of the data base 2015). There, particular mapping units of the area types are described in detail with reference to particular representations. Each **particular representation** contains:

- a text description
- the mapping rules
- information as to how many sections are included in the respective category
- information on building age, provided categorizing statements can be made in that regard
- information on key characteristics
- exemplary representations showing the distribution of the block sections in the urban area, a section from the K5 (Map of Berlin, scale 1 : 5,000 (K5)), a section from the digital orthophotography (Orthophotos, aerial survey April 2009), and ground-level photos of typical blocks, as well as
- where appropriate, notes on changes in content undertaken since the last revision.

The **key characteristics** in each case include the area-weighted mean, the area-weighted 5<sup>th</sup> and 95<sup>th</sup> percentile and the cumulative frequency diagram for the following characteristics:

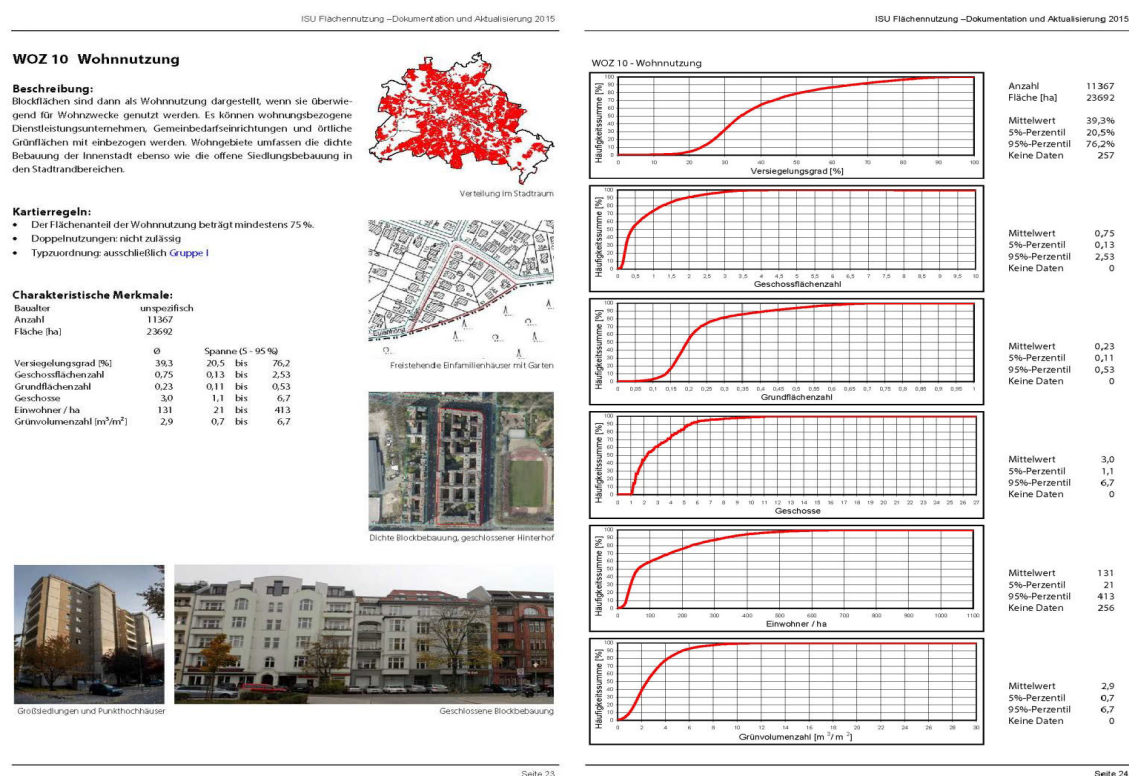
- degree of impermeability (cf. Environmental Atlas Map Imperviousness (01.02) (2012 Edition))

- the Floor Space Index<sup>1</sup> (cf. Environmental Atlas Map Urban Development Density (06.09) (2016 Edition))
- the Site Occupancy Index<sup>3</sup> (cf. Environmental Atlas Map Urban Development Density (06.09) (2016 Edition))
- the number of building storeys<sup>2</sup>
- the number of inhabitants per ha (cf. Environmental Atlas Map Population Density (06.06) (2016 Edition)) and
- the green volume.

These characteristics are the factual data available in the data bases which are regularly generated in the Urban and Environment Information System (ISU), with the block map as the spatial reference. The statements contained in the brief descriptions were calculated according to the current use maps by statistical evaluation. In order to ascertain the ranges, the lower limit was given as the 5<sup>th</sup> percentile, and the upper limit as the 95<sup>th</sup> percentile, in order to avoid including atypical outliers. In exceptional cases, there are indeed therefore sections which fall outside these characteristic ranges (10 % of sections).

In the context of the revision, automated plausibility checks were carried out on the basis of key characteristics, and exceptional sections were visually examined. For some statistical evaluations, only those sections could be used the geometry of which had not been changed with respect to ISU5 2010. For some of the new areas, the necessary data were not yet available.

Table 7 shows the key values ascertained by statistical evaluation for all area types. For example, it is evident that the dense block construction with closed courtyards is the most densely inhabited area type, with an average density of 507 inh./ha. The exceptionally high use intensity of core areas can be seen from the high average floor space indices.



<sup>1</sup> The Floor Space Index (FSI) is calculated as the ratio of the sum of the storeys of all main buildings in the block (not counting such ancillary buildings like garages, etc.) to the area of the block.

<sup>3</sup> The Site Occupancy Index (SOI) is calculated as the ratio between the sum of the built-up and/or build-under areas (main and ancillary buildings, underground car parks etc.) to the block section.

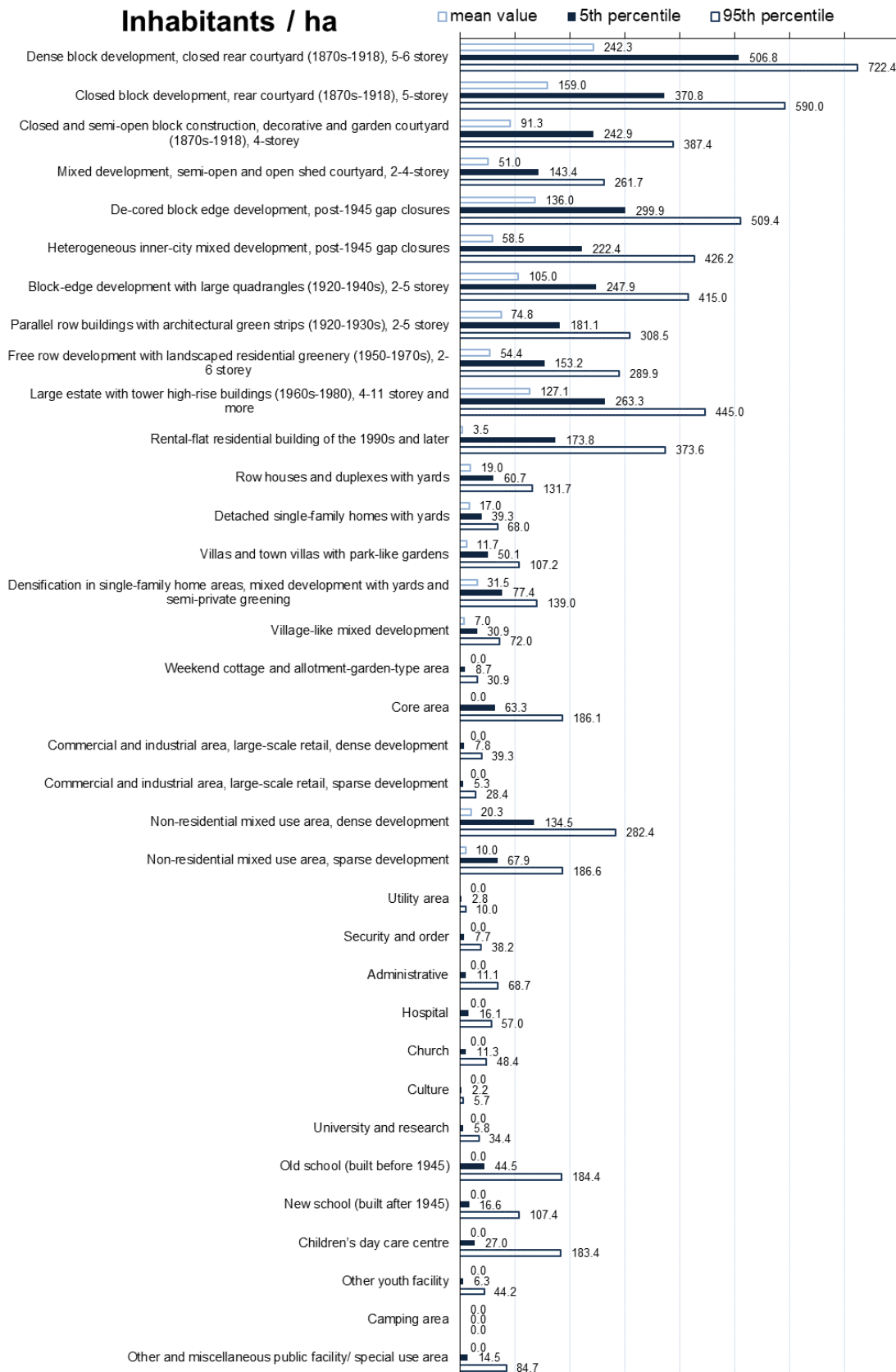
<sup>2</sup> For the calculation of the number of storeys, the quotient of the SOI and the FSI was used (FSI / SOI = no. of storeys).



**Fig. 2: Representation of a single area type (example) from the report on the documentation of mapping units and the updating of the data base 2015**

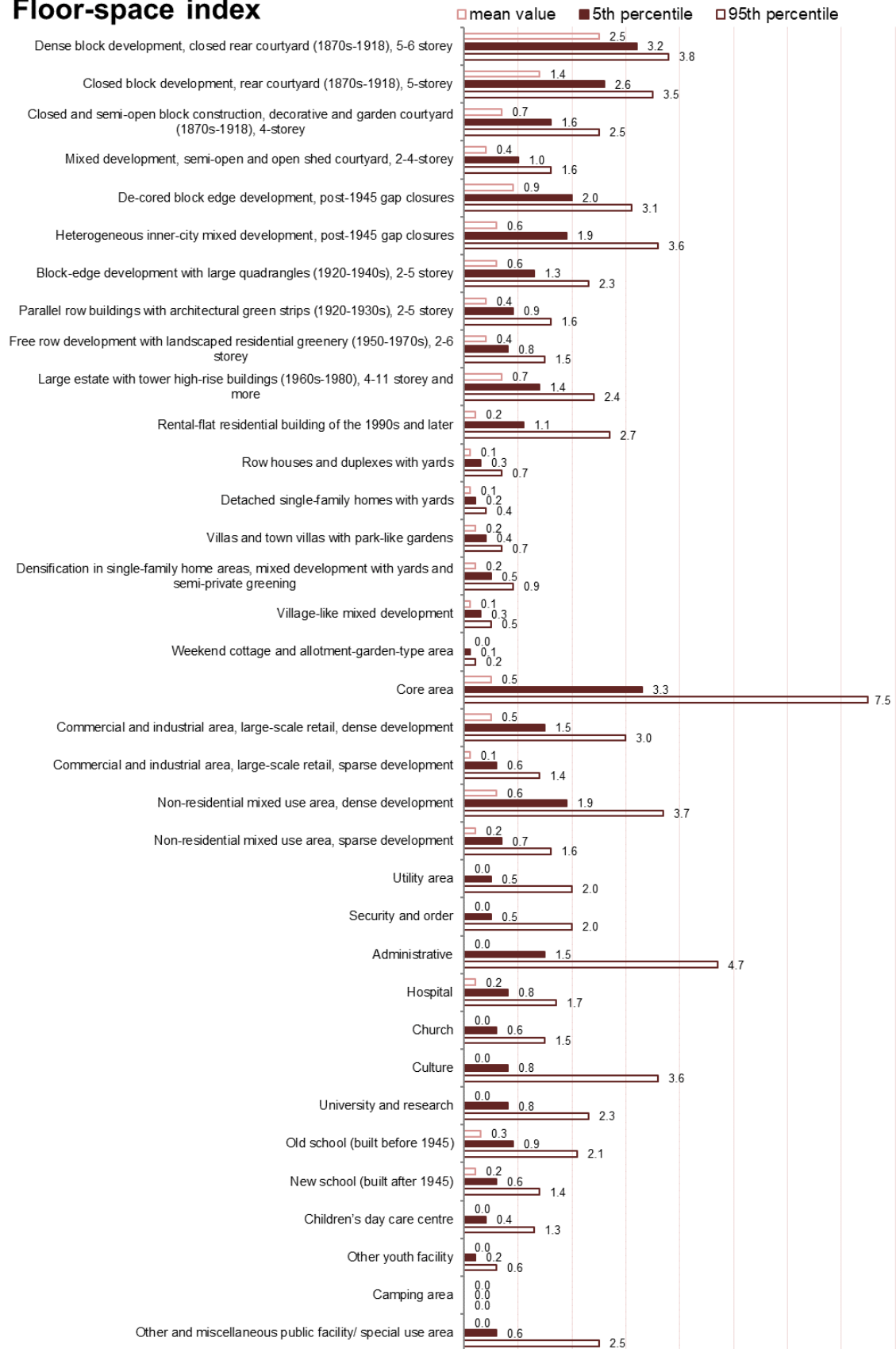
| Area type   | Number of blocks | Area [ha] | degree of imperviousness [%] |                |                 | Floor Space Index |                |                 | Land-to-Building Ratio |                |                 | Storeys |                |                 | Inhabitants / ha |                |                 | Green volume [m³/m²] |                |                 |
|---|------------------|-----------|------------------------------|----------------|-----------------|-------------------|----------------|-----------------|------------------------|----------------|-----------------|---------|----------------|-----------------|------------------|----------------|-----------------|----------------------|----------------|-----------------|
|   |                  |           | Mean                         | 5th percentile | 95th percentile | Mean              | 5th percentile | 95th percentile | Mean                   | 5th percentile | 95th percentile | Mean    | 5th percentile | 95th percentile | Mean             | 5th percentile | 95th percentile | Mean                 | 5th percentile | 95th percentile |
| 1 Dense block development, closed rear courtyard (1870s - 1918), 5 - 6-storey   | 184              | 258       | 84.6                         | 77.3           | 90.8            | 3.2               | 2.5            | 3.8             | 0.6                    | 0.5            | 0.7             | 5.1     | 4.5            | 5.8             | 506.8            | 242.3          | 722.4           | 1.8                  | 0.8            | 3.0             |
| 2 Closed block development, rear courtyard (1870s - 1918), 5-storey   | 1.018            | 1.708     | 77.5                         | 62.7           | 88.8            | 2.6               | 1.4            | 3.5             | 0.5                    | 0.4            | 0.7             | 4.9     | 3.5            | 5.9             | 370.8            | 159.0          | 590.0           | 2.2                  | 0.8            | 3.9             |
| 3 Closed and semi-open block development, decorative and garden courtyard (1870s - 1918), 4-storey                      | 469              | 729       | 64.6                         | 43.8           | 81.4            | 1.6               | 0.7            | 2.5             | 0.4                    | 0.3            | 0.6             | 3.8     | 2.7            | 5.0             | 242.9            | 91.3           | 387.4           | 2.9                  | 1.2            | 4.7             |
| 6 Mixed development, semi-open and open shed courtyard, 2 - 4-storey  | 105              | 202       | 60.4                         | 42.3           | 80.0            | 1.0               | 0.4            | 1.6             | 0.3                    | 0.2            | 0.5             | 2.8     | 1.8            | 3.8             | 143.4            | 51.0           | 261.7           | 2.2                  | 0.9            | 4.2             |
| 7 De-cored block development, post-war gap closure  | 468              | 836       | 65.5                         | 49.0           | 83.5            | 2.0               | 0.9            | 3.1             | 0.4                    | 0.3            | 0.6             | 5.0     | 3.2            | 6.5             | 299.9            | 136.0          | 509.4           | 2.8                  | 1.0            | 5.1             |
| 8 Heterogeneous inner-city mixed development, post-war gap closure  | 89               | 229       | 65.3                         | 45.5           | 86.0            | 1.9               | 0.6            | 3.6             | 0.4                    | 0.2            | 0.7             | 5.1     | 3.0            | 6.9             | 222.4            | 58.5           | 426.2           | 2.4                  | 0.6            | 3.9             |
| 10 Block-edge development with large quadrangles (1920-1940s), 2 - 5-storey   | 581              | 837       | 54.9                         | 39.3           | 72.3            | 1.3               | 0.6            | 2.3             | 0.4                    | 0.2            | 0.5             | 3.8     | 2.8            | 5.0             | 247.9            | 105.0          | 415.0           | 3.0                  | 1.1            | 5.4             |
| 72 Parallel row buildings with architectural green strips (1920s - 1930s), 2 - 5-storey                                 | 252              | 542       | 45.5                         | 29.1           | 62.4            | 0.9               | 0.4            | 1.6             | 0.3                    | 0.2            | 0.4             | 3.4     | 2.5            | 4.5             | 181.1            | 74.8           | 308.5           | 3.8                  | 1.6            | 8.8             |
| 11 Free row development, landscaped residential greenery (1950s - 1970s), 2 - 6-storey                                  | 878              | 2.528     | 40.7                         | 25.3           | 56.9            | 0.8               | 0.4            | 1.5             | 0.2                    | 0.1            | 0.3             | 3.8     | 2.2            | 5.7             | 153.2            | 54.4           | 289.9           | 3.9                  | 1.7            | 7.6             |
| 9 Large estate with tower high-rise buildings (1960s - 1990s), 4 - 11-storey and more                                   | 709              | 2.377     | 44.9                         | 30.9           | 61.2            | 1.4               | 0.7            | 2.4             | 0.2                    | 0.1            | 0.3             | 7.2     | 4.1            | 11.0            | 263.3            | 127.1          | 445.0           | 2.9                  | 0.7            | 5.8             |
| 73 Rental-flat buildings of the 1990s and later   | 482              | 797       | 52.7                         | 21.4           | 81.5            | 1.1               | 0.2            | 2.7             | 0.3                    | 0.1            | 0.6             | 4.2     | 1.8            | 6.9             | 173.8            | 3.5            | 373.6           | 1.9                  | 0.1            | 5.6             |
| 22 Row houses and duplex with yards   | 1.020            | 1.762     | 31.9                         | 17.9           | 50.5            | 0.3               | 0.1            | 0.7             | 0.2                    | 0.1            | 0.3             | 1.8     | 1.0            | 3.0             | 60.7             | 19.0           | 131.7           | 2.1                  | 0.2            | 6.3             |
| 23 Detached single-family homes with yards  | 4703             | 9.647     | 28.7                         | 18.6           | 38.2            | 0.2               | 0.1            | 0.4             | 0.2                    | 0.1            | 0.2             | 1.5     | 1.1            | 2.2             | 39.3             | 17.0           | 68.0            | 2.6                  | 0.7            | 6.7             |
| 24 Villas and town villas with park-like gardens (mostly 1870s - 1945)  | 709              | 1.554     | 31.5                         | 18.1           | 47.1            | 0.4               | 0.2            | 0.7             | 0.2                    | 0.1            | 0.3             | 2.2     | 1.4            | 3.2             | 50.1             | 11.7           | 107.2           | 4.7                  | 1.7            | 8.3             |
| 25 Intensification in single-family home area, mixed development with yard and semi-private greening (1870s to present) | 346              | 933       | 35.2                         | 22.3           | 48.3            | 0.5               | 0.2            | 0.9             | 0.2                    | 0.1            | 0.3             | 2.4     | 1.4            | 3.5             | 77.4             | 31.5           | 139.0           | 3.9                  | 1.4            | 8.2             |
| 21 Village-like mixed development   | 112              | 403       | 34.2                         | 23.0           | 48.8            | 0.3               | 0.1            | 0.5             | 0.2                    | 0.1            | 0.3             | 1.5     | 1.1            | 2.0             | 30.9             | 7.0            | 72.0            | 2.2                  | 0.8            | 3.5             |
| 59 Weekend cottage and allotment-garden-type area   | 253              | 822       | 26.7                         | 7.8            | 39.3            | 0.1               | 0.0            | 0.2             | 0.1                    | 0.0            | 0.2             | 1.0     | 0.0            | 1.5             | 8.7              | 0.0            | 30.9            | 2.7                  | 0.6            | 9.5             |
| 29 Core area  | 286              | 466       | 83.2                         | 59.7           | 99.2            | 3.3               | 0.5            | 7.5             | 0.6                    | 0.2            | 0.9             | 5.9     | 1.9            | 9.9             | 63.3             | 0.0            | 186.1           | 0.8                  | 0.0            | 2.3             |
| 31 Commercial and industrial area, large-scale retail, dense development  | 185              | 765       | 86.6                         | 71.1           | 96.8            | 1.5               | 0.5            | 3.0             | 0.5                    | 0.3            | 0.7             | 3.0     | 1.3            | 5.7             | 7.8              | 0.0            | 39.3            | 0.6                  | 0.1            | 1.5             |
| 30 Commercial and industrial area, large-scale retail, sparse development   | 1.104            | 4.774     | 65.4                         | 26.8           | 89.8            | 0.6               | 0.1            | 1.4             | 0.3                    | 0.0            | 0.4             | 2.3     | 1.0            | 4.3             | 5.3              | 0.0            | 28.4            | 1.3                  | 0.2            | 3.6             |
| 38 Non-residential mixed use area, dense development  | 46               | 116       | 72.9                         | 38.3           | 90.7            | 1.9               | 0.6            | 3.7             | 0.5                    | 0.2            | 0.7             | 4.2     | 1.8            | 6.7             | 134.5            | 20.3           | 282.4           | 1.5                  | 0.4            | 2.7             |
| 33 Non-residential mixed use area, sparse development   | 163              | 411       | 59.4                         | 34.6           | 85.7            | 0.7               | 0.2            | 1.6             | 0.3                    | 0.1            | 0.5             | 2.4     | 1.2            | 3.9             | 67.9             | 10.0           | 186.6           | 2.2                  | 0.6            | 4.9             |
| 32 Utility area   | 132              | 608       | 43.5                         | 0.2            | 90.6            | 0.5               | 0.0            | 2.0             | 0.1                    | 0.0            | 0.4             | 2.8     | 0.0            | 6.3             | 2.8              | 0.0            | 10.0            | 3.3                  | 0.2            | 12.9            |
| 41 Security and order   | 90               | 552       | 39.6                         | 2.2            | 76.5            | 0.5               | 0.0            | 2.0             | 0.2                    | 0.0            | 0.4             | 2.1     | 0.0            | 4.8             | 7.7              | 0.0            | 38.2            | 5.3                  | 0.5            | 13.6            |
| 43 Administrative   | 161              | 398       | 56.6                         | 8.9            | 94.9            | 1.5               | 0.0            | 4.7             | 0.3                    | 0.0            | 0.7             | 4.2     | 1.4            | 7.9             | 11.1             | 0.0            | 68.7            | 3.4                  | 0.1            | 9.8             |
| 46 Hospital   | 87               | 712       | 38.6                         | 14.5           | 69.2            | 0.8               | 0.2            | 1.7             | 0.2                    | 0.1            | 0.4             | 3.5     | 2.0            | 6.0             | 16.1             | 0.0            | 57.0            | 5.8                  | 1.3            | 12.5            |
| 49 Church   | 122              | 115       | 34.0                         | 1.1            | 70.6            | 0.6               | 0.0            | 1.5             | 0.1                    | 0.0            | 0.3             | 3.3     | 1.0            | 6.1             | 11.3             | 0.0            | 48.4            | 5.3                  | 1.1            | 9.9             |
| 45 Culture  | 96               | 261       | 51.5                         | 6.6            | 92.1            | 0.8               | 0.0            | 3.6             | 0.2                    | 0.0            | 0.6             | 2.8     | 0.0            | 7.0             | 2.2              | 0.0            | 5.7             | 3.7                  | 0.0            | 10.6            |
| 44 University and research  | 102              | 496       | 45.2                         | 15.4           | 76.0            | 0.8               | 0.0            | 2.3             | 0.2                    | 0.0            | 0.5             | 3.1     | 1.0            | 5.5             | 5.8              | 0.0            | 34.4            | 3.4                  | 0.3            | 8.0             |
| 12 Old school (built before 1945)   | 187              | 312       | 54.7                         | 26.1           | 75.0            | 0.9               | 0.3            | 2.1             | 0.3                    | 0.1            | 0.4             | 3.5     | 2.1            | 5.0             | 44.5             | 0.0            | 184.4           | 3.6                  | 1.1            | 6.8             |
| 13 New school (built after 1945)  | 406              | 963       | 49.7                         | 27.3           | 70.4            | 0.6               | 0.2            | 1.4             | 0.2                    | 0.1            | 0.3             | 2.8     | 1.7            | 4.6             | 16.6             | 0.0            | 107.4           | 3.2                  | 0.5            | 7.7             |
| 47 Children's day care centre   | 173              | 217       | 36.0                         | 3.5            | 56.7            | 0.4               | 0.0            | 1.3             | 0.2                    | 0.0            | 0.3             | 2.7     | 1.3            | 5.0             | 27.0             | 0.0            | 183.4           | 5.0                  | 1.1            | 11.3            |
| 51 Other youth facility   | 81               | 194       | 20.0                         | 2.8            | 53.9            | 0.2               | 0.0            | 0.6             | 0.1                    | 0.0            | 0.2             | 1.6     | 1.0            | 3.0             | 6.3              | 0.0            | 44.2            | 8.4                  | 1.1            | 13.9            |
| 58 Camping area   | 11               | 46        | 15.8                         | 1.4            | 29.7            | 0.0               | 0.0            | 0.0             | 0.0                    | 0.0            | 0.0             | 0.9     | 0.0            | 1.7             | 0.0              | 0.0            | 0.0             | 8.6                  | 3.0            | 17.2            |
| 60 Other and miscellaneous public facility / special use area   | 158              | 640       | 36.3                         | 6.7            | 87.2            | 0.6               | 0.0            | 2.5             | 0.1                    | 0.0            | 0.5             | 2.9     | 1.0            | 6.8             | 14.5             | 0.0            | 84.7            | 5.3                  | 0.1            | 11.2            |
| 55 Forest   | 2.871            | 16.950    | 0.3                          | 0.0            | 1.8             | 0.0               | 0.0            | 0.0             | 0.0                    | 0.0            | 0.0             | 0.3     | 0.0            | 1.3             | 0.0              | 0.0            | 0.0             | 17.2                 | 7.5            | 23.3            |
| 100 Body of water   | 697              | 5.387     | 0.0                          | 0.0            | 0.0             | 0.0               | 0.0            | 0.0             | 0.0                    | 0.0            | 0.0             | 0.7     | 0.0            | 1.4             | 0.0              | 0.0            | 0.0             | 0.5                  | 0.0            | 1.8             |
| 56 Agriculture  | 496              | 3.595     | 0.5                          | 0.0            | 1.2             | 0.0               | 0.0            | 0.0             | 0.0                    | 0.0            | 0.0             | 0.3     | 0.0            | 1.0             | 0.0              | 0.0            | 0.0             | 0.6                  | 0.1            | 2.0             |
| 36 Tree nursery / horticulture  | 55               | 263       | 23.5                         | 1.9            | 49.1            | 0.1               | 0.0            | 0.3             | 0.1                    | 0.0            | 0.3             | 1.1     | 0.0            | 1.4             | 0.6              | 0.0            | 2.8             | 1.9                  | 0.4            | 5.6             |
| 53 Park / green space   | 1.281            | 3.371     | 9.6                          | 0.1            | 26.7            | 0.0               | 0.0            | 0.1             | 0.0                    | 0.0            | 0.0             | 1.0     | 0.0            | 3.0             | 1.5              | 0.0            | 3.0             | 5.6                  | 0.1            | 13.0            |
| 54 City square / promenade  | 103              | 57        | 42.4                         | 12.2           | 90.3            | 0.1               | 0.0            | 0.7             | 0.0                    | 0.0            | 0.1             | 2.6     | 0.0            | 7.4             | 3.0              | 0.0            | 4.0             | 3.9                  | 0.1            | 8.9             |
| 27 Cemetery   | 181              | 1.122     | 8.1                          | 2.1            | 16.7            | 0.0               | 0.0            | 0.1             | 0.0                    | 0.0            | 0.0             | 1.5     | 0.3            | 2.9             | 1.7              | 0.0            | 7.0             | 9.7                  | 5.1            | 14.8            |
| 37 Allotment garden   | 757              | 3.224     | 22.3                         | 11.3           | 35.4            | 0.0               | 0.0            | 0.1             | 0.0                    | 0.0            | 0.1             | 0.9     | 0.0            | 2.0             | 2.2              | 0.0            | 9.0             | 1.5                  | 0.5            | 3.8             |
| 57 Fallow area  | 783              | 2.691     | 2.0                          | 0.0            | 13.5            | 0.0               | 0.0            | 0.0             | 0.0                    | 0.0            | 0.0             | 0.4     | 0.0            | 1.6             | 0.4              | 0.0            | 0.0             | 3.6                  | 0.3            | 8.6             |
| 16 Sport facility, uncovered  | 459              | 1.716     | 33.7                         | 1.7            | 65.2            | 0.1               | 0.0            | 0.4             | 0.1                    | 0.0            | 0.2             | 1.5     | 0.0            | 3.0             | 3.1              | 0.0            | 19.3            | 3.1                  | 0.4            | 7.6             |
| 17 Sport facility, covered  | 61               | 115       | 50.0                         | 18.0           | 81.0            | 0.8               | 0.1            | 2.4             | 0.3                    | 0.1            | 0.6             | 2.6     | 1.0            | 5.0             | 3.5              | 0.0            | 16.7            | 2.8                  | 0.2            | 6.6             |
| 91 Parking area   | 195              | 192       | 51.3                         | 10.7           | 88.6            | 0.1               | 0.0            | 0.3             | 0.1                    | 0.0            | 0.3             | 1.1     | 0.0            | 3.8             | 3.1              | 0.0            | 5.9             | 2.6                  | 0.0            | 8.0             |
| 93 Airport  | 56               | 444       | 4.7                          | 0.0            | 10.8            | 0.1               | 0.0            | 0.3             | 0.0                    | 0.0            | 0.2             | 0.9     | 0.0            | 5.8             | 0.0              | 0.0            | 0.0             | 0.6                  | 0.0            | 2.6             |
| 92 Railway station and railway ground, without track area   | 235              | 360       | 49.1                         | 0.4            | 98.4            | 0.3               | 0.0            | 1.3             | 0.1                    | 0.0            | 0.5             | 1.4     | 0.0            | 3.7             | 0.6              | 0.0            | 0.8             | 2.0                  | 0.0            | 6.8             |
| 99 Track area   | 575              | 1.349     | 43.5                         | 11.6           | 84.4            | 0.0               | 0.0            | 0.0             | 0.0                    | 0.0            | 0.0             | 1.0     | 0.0            | 3.0             | 0.0              | 0.0            | 0.0             | 2.8                  | 0.2            | 8.5             |
| 94 Other traffic area   | 553              | 282       | 45.8                         | 0.4            | 92.1            | 0.2               | 0.0            | 1.1             | 0.1                    | 0.0            | 0.5             | 0.9     | 0.0            | 3.0             | 6.3              | 0.0            | 46.2            | 3.2                  | 0.1            | 10.4            |
| 98 Construction site  | 26               | 75        | 34.4                         | 0.0            | 73.3            | 0.2               | 0.0            | 0.5             | 0.0                    | 0.0            | 0.2             | 1.2     | 0.0            | 3.4             | 0.1              | 0.0            | 0.0             | 1.4                  | 0.2            | 3.6             |

**Tab. 7: Key characteristics for selected area types, as of: December 31, 2015**



*Fig. 3: Evaluation of key characteristics for selected area types, inhabitants/ha as of: December 31, 2015*

## Floor-space index



*Fig. 4: Evaluation of key characteristics for selected area types, Floor Space Index, as of: December 31 2015, FSI data as of: January 2015*

## Grouping by structure types

In Map Urban Structure (06.07), similar area types are grouped into 16 overarching **structure types**, as well as body of water (which cannot be assigned a “classic” structure type):

| Tab. 8: Grouping of Area Types (Environmental Atlas Map 06.08) into Structure Types (Environmental Atlas Map 06.07) |  |
|---|--|
| Structure type  | Area type  |
| <b>Structure Types with Predominantly Residential Use</b>   |  |
| (1) Wilhelminian-period block development with wings and rear buildings (until 1918)                                | (1) Dense block development, closed rear courtyard (1870s - 1918), 5 - 6-storey<br>(2) Closed block development, rear courtyard (1870s - 1918), 5-storey   |
| (2) Wilhelminian-period block-edge development with few wings and rear buildings                                    | (3) Closed and semi-open block development, decorative and garden courtyard (1870s - 1918), 4-storey<br>(6) Mixed development, semi-open and open shed courtyard, 2 - 4-storey   |
| (3) Wilhelminian-period block-edge development with major changes   | (7) De-cored block development, post-war gap closure   |
| (4) Block-edge and row development of the 1920s and 1930s   | (10) Block-edge development with large quadrangles (1920s - 1940s), 2 - 5-storey<br>(72) Parallel row buildings with architectural green strips (1920s - 1930s), 2 - 5-storey  |
| (5) Row development since the 1950s   | (11) Free row development, landscaped residential greenery (1950s - 1970s), 2 - 6-storey   |
| (6) Postwar high-rise development   | (8) Heterogeneous inner-city mixed development, post-war gap closure<br>(9) Large estate with tower high-rise buildings (1960s - 1990s), 4 - 11-storey and more  |
| (8) Residential development of the 1990s and later  | (73) Rental-flat buildings of the 1990s and later  |
| (10) Low buildings with yards   | (22) Row houses and duplex with yards<br>(23) Detached single-family homes with yards<br>(59) Weekend cottage and allotment-garden-type area   |
| (11) Villa development with park-like gardens   | (24) Villas and town villas with park-like gardens (mostly 1870s - 1945)   |
| (12) Development with yards and semi-private greening   | (25) Densification in single-family home area, mixed development with yard and semi-private greening (1870s to present)  |
| (13) Village-like development   | (21) Village-like mixed development  |
| <b>Structure Types with Predominantly Retail, Service, Commercial and Industrial Use</b>                            |  |
| (14) Development with predominantly retail and service use  | (29) Core area   |
| (15) Sparse development with predominantly commercial and industrial use  | (33) Non-residential mixed use area, sparse development<br>(30) Commercial and industrial area, large-scale retail, sparse development<br>(32) Utility area  |
| (16) Dense development with predominantly commercial and industrial use   | (38) Non-residential mixed use area, dense development<br>(31) Commercial and industrial area, large-scale retail, dense development   |
| <b>Structure Types with Other Uses (Public Facilities, Traffic Area, Construction Site or Green and Open Space)</b> |  |
| (17) Development with predominantly public and special use, construction site or non-street traffic area            | (41) Security and order<br>(43) Administrative<br>(45) Culture<br>(12) Old school (built before 1945)<br>(13) New school (built after 1945)<br>(44) University and research<br>(49) Church<br>(46) Hospital<br>(47) Children's day care centre<br>(51) Other youth facility<br>(17) Sport facility, covered<br>(60) Other and miscellaneous public facility / special use area<br>(93) Airport<br>(91) Parking area<br>(92) Railway station and railway ground, without track area<br>(99) Track area<br>(94) Other traffic area<br>(98) Construction site |
| (18) Public facility and special-use area with sparse or no development; green and open space                       | (55) Forest<br>(56) Agriculture<br>(53) Park / green space<br>(54) City square / promenade<br>(27) Cemetery<br>(37) Allotment garden<br>(57) Fallow Area<br>(58) Camping area<br>(16) Sport facility, uncovered<br>(36) Tree nursery / horticulture  |

**Tab. 8: Grouping of area types to structure types**

The representation of the structure types is concentrated, even more than that for the area types, on areas with primarily residential use. The 17 differentiated area types with primarily residential use are



grouped into 11 structure types with such use, while the other 34 area types (not including body of water) with other uses are grouped into the five remaining structure types.

The 11 structure types with primarily residential use are differentiated on the basis of the structure of their buildings and open spaces, and of their building age.

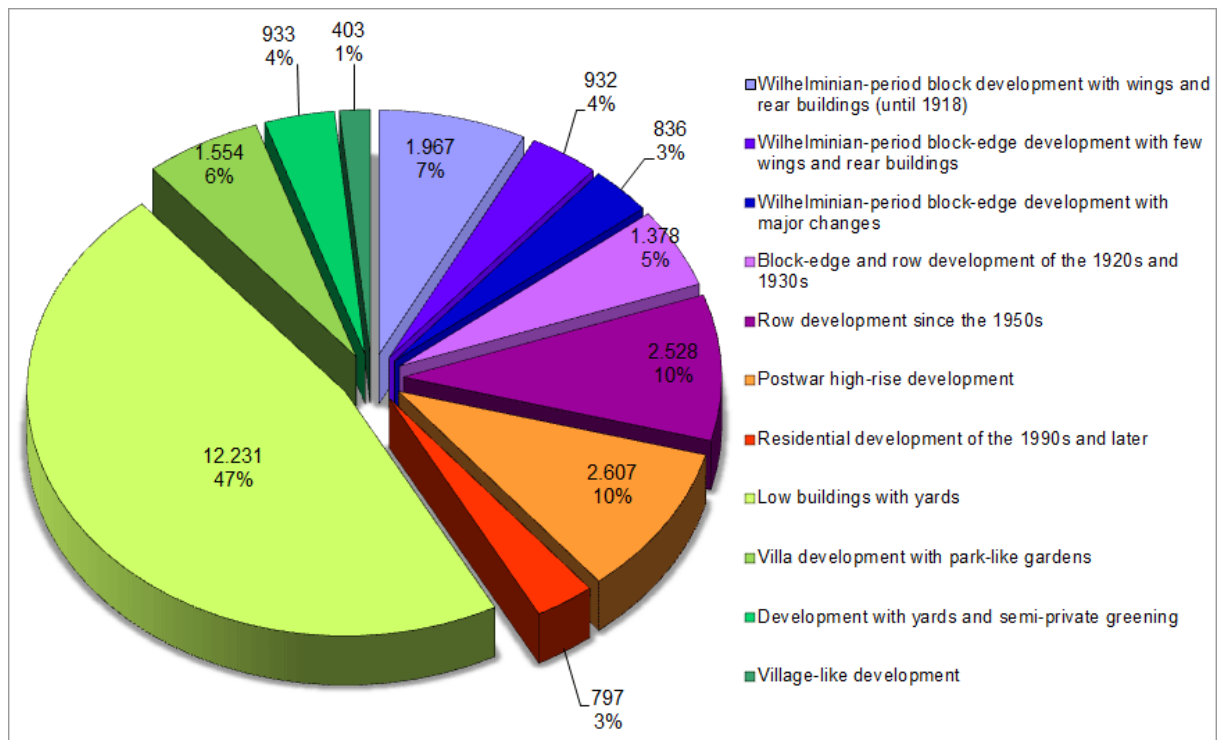
| Tab. 9: Description of the structure types with predominately residential use    |  |  |
|--|--|--|
| Structure type   | Building structure and age   | Open-space structure   |
| (1) Wilhelminian-period block development with wings and rear buildings          | 5-6 storeys, closed or almost closed block-edge, front building, wings, rear building(s); built 1870-1918  | Angled interior block spaces, narrow, largely impervious courtyards, often with small flower beds and/or single trees  |
| (2) Wilhelminian-period block-edge development with few wings and rear buildings | Usually 4 storeys, some lower, largely closed block-edge, front building, either wings or rear building, some 1-2 storey sheds, mostly built 1892-1918, some older   | Jagged shaped or longitudinal interior block spaces divided by fences or separated into small segments by walls and sheds; usually with front yard and landscape or commercially used and hence impervious courtyards  |
| (3) Wilhelminian-period block-edge development with major changes                | 5-6 storeys, largely closed block-edge, older Wilhelminian-period buildings at the block-edge, mixed with many newer buildings; built after 1945, some older   | Block interior spaces divided by fences, walls or the wings or rear buildings with fairly large courtyards, as garden courts, storage spaces or car parks, often with a little greenery, or contiguous interior space, with pathways, playgrounds, with lawns and shrubbery as leisure areas for inhabitants |
| (4) Block-edge and row development of the 1920s and 1930s                        | 2-5 storeys, large quadrangles with almost closed block-edge or parallel row development, with open block-edge   | Contiguous block interior spaces or subdivided block sections with longitudinal open space; with decorative lawns and scattered trees and hedges along the houses, play area and waste bin locations.  |
| (5) Row development since the 1950s  | Mostly 4 storeys, house rows either parallel, staggered arrangement along curved streets, or in chain or spider-web form   | Subdivided block sections with longitudinal free spaces; with parking spaces and play areas, as well as entry pathways and decorative lawns with scattered trees and bushes  |
| (6) Postwar high-rise development  | Usually 4-6 storeys, row development or mixed block-edge and row development with concrete plate construction; interspersed with tower or rectangular high-rises in open arrangement within the block, with more than 6 storeys; mostly built 1960s-1980s                                | Usually open structured but not enclosed block section; contiguous block interiors place only in case of block-edge development; with geometrical, broad entry pathways and parking spaces, as well as decorative lawns and shrubbery  |
| (8) Residential development of the 1990s and later                               | 2-7 storeys, block-edge development, row development, town-villa estates and townhouses, compact development; built since the early '90s   | Block interior space either continuous or broken down by rows of houses or single villas; open free space with entry pathways and parking spaces, with decorative lawn, shrubbery and single trees   |
| (10) Low buildings with yards  | 1-2 storeys, single-family homes and duplexes, row houses, smaller rental-flat buildings, weekend cottages and scattered workshops; older developments around block-edges, the more recent along spur streets and access paths into the block interiors; built since early 20th century. | Continuous interior block space, separated by fences on lot boundaries; in older estates, subdivided into longitudinal free spaces separated by fences and lot boundaries; decorative or vegetable gardens or orchards   |
| (11) Villa development with park-like gardens                                    | 1-3 storeys; large rental-flat buildings between single-family homes with villas; built since 1950   | Subdivided interior block spaces; with mixture of decorative lawns and shrubbery around flats, and park-like gardens or decorative or vegetable gardens or orchards.   |
| (12) Development with yards and semi-private greening                            | Mostly 2-storey; block-edge development with villas, rental villas and country homes, large building volumes; built 1890s to present   | Front yard; contiguous interior block spaces separated by fences and lot boundaries; with park-like gardens with old trees on lawns  |
| (13) Village-like development  | Mostly 2-storey; mixture of new buildings and farmhouses, also buildings in the former village cores   | Village-like elements include layout of streets, village greens, village pond, manor parks, cemeteries around churches at least discernible; spaces with gardens, garden cafés, storage spaces for commercial and trade businesses   |

*Tab. 9: Description of structure types with predominately residential use*

This differentiated perspective has repeatedly proven to be effective. For example, the urban structure mapping system was taken as a secondary data source for the overall city biotope mapping process, and the description of the structure types on the basis of the structures of the buildings and free spaces has largely been adopted for the descriptions of the biotopes in built-up areas (see also: [Berlin's biotope type list \(only in German\)](#)).

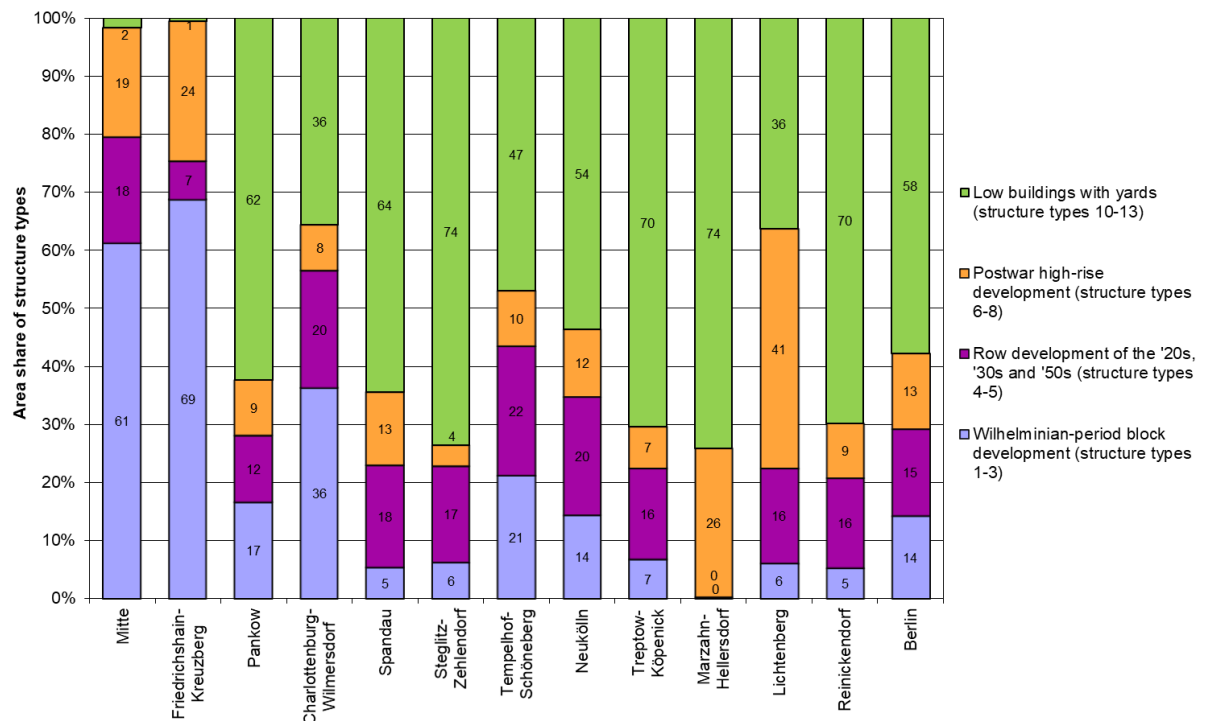
## Distribution of structure types in Berlin

The 11 **structure types of primarily residential use** occupy approx. half of the built-up areas of Berlin. The category "Low buildings with yards" occupies 47 %, by far the largest portion of residential areas, followed by "Postwar high-rise development", with 10 %. "Village-like development" has the lowest shares of the area, with 1 % each (cf. Fig. 5).



**Fig. 5: Shares of structure types with primarily residential use of the total area of Berlin with primarily residential use, or mixed use with residential character, Area sizes based on block map ISU5**

The distribution of the urban structure types within the Berlin boroughs shows the different urban development character of these boroughs (cf. Fig. 6).



**Fig. 6: Shares of structure types with primarily residential use of the total area of the Berlin boroughs, and of the entire city, in per cent**

In Mitte and Friedrichshain-Kreuzberg, a relatively high proportion of Wilhelminian-period block development has been preserved, amounting to between two thirds and three quarters of the residential

area; in some cases however it has been considerably changed. In the other boroughs, that share is considerably less; citywide, the average of buildings from that period is only 14 %. In Marzahn-Hellersdorf, both the share of Wilhelminian-period block development and that of row development is vanishingly small. The largest share of row development occurs in Tempelhof-Schöneberg, followed by Charlottenburg-Wilmersdorf and Neukölln. The high share of development of the post-war era accounts for an above-average share in the boroughs of Lichtenberg (41 %) and Marzahn-Hellersdorf (26 %). Low buildings with garden structures are almost completely absent in the inner-city borough of Friedrichshain-Kreuzberg, but account for approx. three quarters of the residential area in the boroughs on the edge of the city, Steglitz-Zehlendorf, Treptow-Köpenick, Marzahn-Hellersdorf and Reinickendorf.

The **Wilhelminian-period block development with wings and rear buildings** (structure type 1), which have hardly changed since they were built can be found in parts of Charlottenburg and Wilmersdorf, between Lietzensee (Lake), Kurfürstendamm, Richard-Wagner-Straße and Spandauer Damm. In Moabit, Wedding and in Friedrichshain between the Circle Line and Petersburger Straße, along Warschauer Straße, and also in Kreuzberg, Neukölln and Schöneberg between the axes Neukölln Shipping Canal/Skalitzer Straße/Gitschiner Straße, Karl-Marx-Straße/Gneisenaustraße/Yorckstraße, and Potsdamer Straße/Hauptstraße, the dense development with typical rear courtyard structures have largely been preserved.

The **Wilhelminian-period block-edge development with few wings and rear buildings** (structure type 2), which includes the area types "Decorative and garden courtyards" and "Shed courtyards", can be found in the former suburbs of Berlin outside the Circle Line. These building structures, too, have hardly been changed since they were built. Large such areas exist in Friedenau, in Steglitz, in Tempelhof and Friedrichshagen, in Oberschöneweide, Karlshorst, Pankow, Niederschönhausen, and Spandau, and in Reinickendorf west of Provinzstraße.

Large areas of **Wilhelminian-period block-edge development with major changes** (structure type 3), which emerged as the result of war-time destruction and reconstruction, or of reconstruction with massive demolition of Wilhelminian-period block development, are found within the Circle Line, particularly in Charlottenburg between Otto-Suhr-Allee and Bismarckstraße and along Spandauer Damm, in Tiergarten around the Spree Bend and Invalidenstraße, and south of the Landwehr Canal around Potsdamer Straße, in Wedding between the City Rail Line between Nordbahnhof, Gesundbrunnen and Bernauer Straße, and in Friedrichshain west of the Warschauer/ Petersburger Straße corridor and, east of these streets, in the area of Frankfurter Allee. Also in Schöneberg and Wilmersdorf, there are many areas in which the typical Wilhelminian-period courtyard structure was changed significantly by reconstruction and renovation.

In Prenzlauer Berg, Kreuzberg, Charlottenburg and Neukölln, very much of the Wilhelminian-period development of the area types with "closed courtyard" and "courtyard" is still preserved in its original form. The share of very dense development of the type "closed courtyard" is relatively high in Neukölln, Wedding and Kreuzberg. Preservation-oriented reconstruction, under which the original Wilhelminian-period block structures were largely preserved, occurred most prominently in Kreuzberg. In Tiergarten, Friedrichshain and Wilmersdorf, war-damage to Wilhelminian-period block development was largely eliminated and replaced, particularly by new buildings of the post-war block-edge type. Major changes in Wilhelminian-period buildings through reconstruction by de-coring were most common in Wedding.

The **1920s and 1930s block-edge and row development** (structure type 4) is found mainly outside the Circle Line. Frequently, the rows and quadrangles were built in neighbourhoods where the "Wilhelminian-period development with few wings and rear buildings" type dominated, at the edge of the former suburbs of Berlin. They are as a rule served by the City Rail and subway/ underground network.

The **1950s and later row development** (structure type 5) were built mostly in the Berlin outskirts, outside the Circle Line. They were created on former open spaces (agriculture areas, etc.) without regard for existing transport corridors or development structures. Within the Circle Line, formerly built-up areas were replaced by row development. This includes large areas in Mitte, Friedrichshain and Kreuzberg, but sporadic areas with row development in the former Wilhelminian-period block structure also exist in other inner-city areas.

The **Postwar high-rise development** (structure type 6) can be found as heterogeneous inner-city mixed development in the western parts of the city. Large areas of this type exist in Wilmersdorf around Bundesallee, in Schöneberg in the area of Nollendorfplatz and Kleiststraße, and in Kreuzberg between Wilhelmstraße and Stresemannstraße. The major share of postwar high-rise buildings are assigned to the area type "Post-war high-rise development with single tower high-rises". Within the Circle Line, these are found only in Kreuzberg, Mitte and Friedrichshain, where smaller developments of this area type emerged. As a rule, the high-rise developments were built outside the City Rail Circle Line. Major such complexes in West Berlin include Gropiusstadt in Neukölln, developments in Lichtenrade, Marienfelde,

Lichterfelde and Spandau, and the Märkisches Viertel in Reinickendorf. In East Berlin, the largest developments are found in Hohenschönhausen, Marzahn, Hellersdorf and Lichtenberg. Estates with block-edge and row development with concrete plate construction and single tower high-rises are mostly found in Hellersdorf, Marzahn and Spandau. Smaller such estates were also built e.g. in Köpenick and Hohenschönhausen.

Large areas of structure type 8 “**Residential development of the 1990s and later**” were mostly built in the context of urban development projects, mostly on the outskirts of the eastern part of the city, as in Karow-Nord and Buchholz. Some of the larger residential projects, such as Rummelsburger Bucht, are also at the inner-city edge. The largest project in the western part of the city is Wasserstadt Oberhavel in Spandau.

The **Low buildings with yards** (structure type 10) with usually single-family homes or duplexes and yards can be found throughout the outskirts of the city.

The **Villa development with park-like gardens** (structure type 11) emerged mainly during the Wilhelminian period in scenically attractive areas; this has hardly changed since then. Major such areas are located near the Grunewald Forest in Nikolassee, in Zehlendorf, Dahlem and Grunewald, in Lichterfelde, near the Tegel Forest in Hermsdorf and Frohnau, along the Dahme at Grünau, and in the area the Müggelspree river at Rahnsdorf.

**Development with yards and semi-private greening** (structure type 12), in which villa development and/or low single family houses are interspersed with larger rental-flat and studio-apartment buildings, occurs mainly in the southern urban area, particularly in the transitional areas between villas and single family housing in Lichterfelde and Zehlendorf.

**Village-like development** (structure type 13) is still preserved on the outskirts of town only in the old village cores; in the eastern boroughs, more and larger village structures can generally be found.

Structure types with **Predominantly retail, service, commercial and industrial use** are concentrated along waterways and railroad lines.

**Development with predominantly retail and service use** (structure type 14) is largely found in the old core areas of the various parts of the city. This applies particularly to both the city centre areas of West and East Berlin concentrated around Kurfürstendamm/ Tauentzienstraße and Alexanderplatz/ Friedrichstraße, respectively.

**Densely built-up commercial and industrial areas** (structure type 16) occur less frequently than **commercial areas with sparse development** (structure type 15).

Structure types of **Development with predominantly public facilities and special use** are to be found relatively evenly distributed throughout the urban area.

Obviously, **Green and open spaces** (part of structure type 18) are more common in the outskirts area than in the inner city. As **Traffic areas** (part of structure type 17), for example, Tegel Airport and the railway grounds stand out, as do the large car-parking areas at the Olympic Stadium and in the area of the ICC/ZOB.

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