

06.01 Actual Use of Built-up Areas / 06.02 Inventory of Green and Open Spaces (Edition 2011) 06.01.1 Actual Use / 06.02.1 Actual Use and Vegetation Cover (Edition 2015)

Overview

Social, political and economic changes generate new tasks and functions for a city, many of which cannot be satisfied within the framework of existing urban structures. Even 17 years after the reunion of the two parts of the formerly divided city, Berlin is still engaged in a prolonged process of economic and demographic restructuring. The expected developments formulated in the [Berlin Land Use Plan](#) (FNP 94) at the beginning of the 1990s (cf. [text, 1995 Edition](#)) have been only partially realized to date. A major growth impetus was predicted for the Berlin metropolitan area and its immediate surroundings through 2010. Instead, the real development showed a slight decrease in population which only reached its 1991 level again in 2010; at the same time, there was also a loss of jobs.

Unforeseen developments, such as socio-spatial segregation, surface discharges and scarcity of financial resources require new strategic considerations for urban and landscape planning, for which a knowledge of current land use is an indispensable precondition. The impact of urban residential areas on the environment depends to a large extent on the type and intensity of human use. For this reason, the effects on the environment, and also the nature and potentials of urban space, are closely linked to uses and structures.

The **actual-use and urban-structure mapping procedures of the Environmental Atlas** go back to concepts and strategies from the 1980s, and have since become increasingly important. In terms of spatial and substantive differentiation, these maps are important especially for city-wide higher-level analyses, models and programmes in the areas of the environment, urban development and landscape planning. A close integration of the content of the present actual-use maps therefore exists with the [maps on Urban Structure, 6.07 and 6.08](#), of the Environmental Atlas. The actual use shown in Maps 06.01 and 6.02 is to some extent further differentiated in those maps. Particularly for the use category Housing, which includes a broad spectrum of urban structures, a further differentiation is of particular interest, in order to be able to derive various urban and environmental **indicators and parameters**. Since not all data required for certain calculations or plans are available, or can be collected with reasonable effort locally, an approach has been adopted in recent decades that can be described as that of “urban-structure typology”. Under this process, indicator values are derived on the basis of random samples, data obtained from the literature, or expert assessment, and parameters are assigned to the mapping units. Since the utilization and urban structure have been mapped completely, these indicators can then be transferred to the entire city for many applications with a sufficient degree of accuracy.

Especially for the tasks of **urban and landscape planning**, an understanding of the current land use situation in Berlin is vital. Thus, an evaluation of the needs of the population for recreational opportunities near their homes requires information on the location of residential areas and of open spaces. Also, the close proximity of certain pollution sources to sensitive areas, such as commercial areas to housing or allotment gardens, can provide indications on existing conflicts (noise pollution, air quality, heavy-metal pollution of the soil), and strategies for solutions can be developed. Similarly, without detailed knowledge of various urban structures, the development of planning concepts for adapting to climate change would not be possible.

Finally, the data of the **City and Environment Information System (ISU)** are used in the everyday planning process, as a result of their use as a base of information for landscape care plans,

environmental reports as part of the construction planning process, and for other environmental impact assessments and statements.

Maps 06.01 and 06.02 together constitute a mutually complementary **comprehensive presentation of actual land use** in Berlin, and should, in terms of their content, be considered a single map, which is only shown as two maps for reasons of readability. For methodological reasons, these maps partly overlap. Therefore, beginning 2015 two further maps are being provided, in which the information that had hitherto been separated is combined, so that the actual use is comprehensively represented across all use types. The following text always refers to all maps, unless reference is expressly made to a particular one.

Statistical Base

The data on use of built-up and non-built-up areas derive from a large number of sources which are described in a differentiated manner in the respective editions. The basis for the categorization and use assignment was provided by the land use maps in the 1985 Environmental Atlas for the former West Berlin, 06.01 Actual Use of Built-up Areas, and 06.02 Inventory of Green and Open Spaces, as well as the editions published for all of Berlin in **1995** (06.01/06.02), **2002** (06.01/06.02), **2004** (06.01/06.02) and **2008** (06.01/06.02).

For the update of the **2011 Edition** (as of Dec. 31, 2010), changes in land use during the period 2005 through 2010 were ascertained, and updates of the geometries of the Block Map 1:5000 (ISU 5) were undertaken. Moreover, the data base for actual-use mapping was subjected to plausibility checks on the basis of various geo-data available in the State of Berlin. The Environmental Atlas Maps [6.07/6.08, Urban Structure](#) were compiled in parallel with these maps.

In all, the following databases were used to update and verify the actual-use mapping:

- Block Map 1:5000 of the Urban and Environmental Information System (ISU) of the Senate Department for Urban Development, III F; as of Dec. 31, 2005, with updated block areas
- Changes of the geometries of blocks of the Spatial Reference System (RBS) of the Berlin-Brandenburg Office of Statistics (AfS; formerly the Berlin State Statistical Office), 2005-2010
- Digital aerial photography, SenStadt Abt. III (Aerial Image Archive); flights in 2004 and Apr. 2009
- Area Monitoring, 2005-2012, SenStadt I A 1
- Automated Property Register (ALK) 1:1000, SenStadt III C, as of June 2010
- Map of Berlin 1:5000 (K5), survey departments of the boroughs, as of 1995, 2006 and Jan. 2010
- Land Use Plan 1:50,000 (FNP), SenStadt IB 1, as of 2009
- Cemetery inventory, 1:1,000, SenStadt IC 2, as of 2009
- Green space inventory, 1:1000, SenStadt IC 2, as of 2010
- Allotment gardens inventory, 1:1,000, SenStadt IC 2, as of 2009
- Building age 1:1000, from "Development of the Urban Structure of Berlin since 1650 in Maps," at building level, only as image, only inner city, only to ca. 1980
- Imperviousness of 1:5000, SenStadt III F, as of 2005
- Population data 1:5000, AfS and SenStadt III F, as of 2009
- Habitat mapping 1:5000, SenStadt I.E., as of 2009
- Sports facilities, SenStadt III F, survey by the Sports Administration in the mid-1990s
- Site occupancy index (GRZ) 1:5000, SenStadt III F, as of 2008
- Vacancy analysis, SenStadt I A, as of 2009
- School sites, Senate Administration for Education, Science and Research, as of 2010
- State Real Property 1:500, SenStadt IA, as of 2010

Methodology

All information about actual land use is managed and processed at the ISU (*Informationssystem Stadt und Umwelt*: Urban and Environmental Information System). This makes possible a graphic data processing of the factual data on basis of a **uniform spatial reference system**.

The spatial reference system (edition 2007) is provided by the Block Map, 1:5000 – the Urban and Environmental Information System (ISU5), which is in turn based on the Block Map of the Statistical Office of Berlin-Brandenburg (AfS). Each statistical block is as a rule delimited by streets. The numbering and the limitation of blocks is handled by the AfS.

In the ISU block map, the AfS blocks can be further subdivided. The block segments constitute the smallest reference area here, and are delimited within a statistical block according to differing land use. The block segments are not part of the statistical block system of the AfS, but are shown only in the block map of the ISU. Thus, a total of 24,961 blocks and block segments result.

Some 13,000 of these areas correspond to the statistical units of the Office of Statistics, while some 3000, mainly large and vacant blocks from the AfS map, have been subdivided into some 12,000 ISU block segments.

The uniform reference system makes possible a clear spatial identification of all factual data. By means of a common key, which contains, among other things, borough, block and block segment numbers, these data are assigned to the spatial reference system.

The Environmental Atlas Map 06.01 Actual Use of Built-Up Areas and 06.02 Inventory of Green and Open Space, record the actual land use in Berlin on the basis of 22 different categories, which are described in greater detail in the following sections. The procedure for the determination of the various land use categories is detailed in the report which documents the mapping unit and the updating of the database.

Table 1: The use categories in the Environmental Atlas Maps 06.01 and 06.02	
Actual use of built-up areas	Green and open space
Residential Areas	Forest
Mixed Areas	Bodies of Water
Core Areas	Meadows and Pastures
Commercial/ Industrial / Large-Scale Retail Areas	Farmland
Public Use/ Special Use	Parks/ Green Spaces
Utilities	City Squares/ Promenades
Weekend Cottages/ Allotment-Garden-Type Use	Cemeteries
Traffic Areas	Allotment Gardens
Construction Sites	Fallow Areas, No Vegetation
	Fallow Areas, Meadow-Like Vegetation
	Fallow Areas, Mixed Vegetation – Meadows, Trees, Bushes
	Sports Use
	Tree Nurseries/ Horticulture

Tab. 1: Use Categories for the Environmental Atlas Maps 06.01 and 06.02

The Maps 06.01 Actual Use of Built-Up Areas and 06.02 Inventory of Green and Open Space together constitute a comprehensive representation of actual land use.

For Public / Special Uses, Utilities Areas, Commercial / Industrial Uses, Mixed Uses with commercial character and Traffic Areas, it is possible to simultaneously map certain of green and open space use categories, in order to also permit ascertainment of any unusual vegetation-determined character of certain areas. Thus, in addition to their actual use, these areas are also characterized in terms of the type of their vegetation cover. As a result, for some areas with these uses, there is an overlap – so-called **dual use**¹ – of the two maps. For other uses, no dual use is allowed, since building use by definition, due to its high intensity, either excludes green use (e.g., core area use), or else may intrinsically include a large green or open space share (e.g., Weekend Cottages and Allotment Gardens).

Examples of the application of dual use include:

- The ascertainment of ecologically relevant urban stocks of ruderal vegetation or forest-like stocks on low intensity traffic areas, or commercial or utilities sites,
- the ascertainment of public needs and special uses, which also exhibit the character of green use, such as borough horticultural offices, the field experimental fields of universities, or sports fields; or

¹ For example, in Map 06. 01, a sports field is marked as a Utilities site and in Map 06. 02, as Sports Use. Also, a median strip may be recorded either as a Traffic Area (Map 06. 01), or as Fallows (Map 06. 02).

- the ascertainment of linear stands of vegetation along rail lines, waterways and roads.

Since in many applications, only one piece of usage per area can or should be processed, it is necessary to aggregate the information of the two use mapping procedures in order to have only one piece of usage information per area throughout. For most applications in the environment area, green and open space usage is of particular interest, since this is the dominant feature of the ecological nature of an area (e.g., vegetation structure and evaporation behaviour). Other applications, however, are more interested in building use (e.g., when comparing the actual-use profiles for a proposed land use plan, or in assessing the impact of the effects of noise on people). Therefore, beginning in 2015 the use is additionally represented in the two maps Actual Use (06.01.1) and Actual Use and Vegetation Cover (06.02.01), in which both the uses of Map 06.01 and those of Map 06.02 are shown together. In Map 06.01.1, in case of dual use (currently about 1600 cases), the construction use is shown, i.e. the presentation exhibits **construction priority**. By contrast, in Map 06.02.1 the presentation exhibits **green priority**, i.e., in case of dual use, green and open space use is shown. Since when drawing a balance of the shares of the city's territory occupied by the categories, each category can be taken into account only once, this procedure ensures that the area share can be calculated separately, depending on the goals of a particular assessment.

Updating the Geometry and Usage Data

In addition to the primary updating process in the context of the update of Block Map 1:5000 (ISU5) of Berlin, the focus of the continuation of the 2011 Edition was on the research and analysis of digital data collected by the sections of the Senate Department for Urban Development in other contexts, by means of which a more extensive, semi-automated update and review of the entire data set could be accomplished. In this context, the mapping units of both the actual-use and the urban-structure mapping processes were subjected to a revision, and some adjustments or clarifications were made. Moreover, the rules on the admissibility of combinations of various land uses and types of areas have been revised, and, based on these rules, plausibility checks implemented for the entire data base.

Update of the Digital Map of Berlin 1:5000 (ISU5)

The block boundary changes carried out between 2005 and 2010, including the current area key of the Berlin-Brandenburg Office of Statistics, have been adopted into the geometry of the ISU5. For all newly created blocks, and for the area monitoring areas (SenStadt Dept. I), a use mapping procedure was carried out with the aid of aerial photography and other documents (see Statistical Base). In this process, a further subdivision of the block areas into homogeneous-use block segments was implemented, corresponding to the presentation in the land-use and area-type system of the Environmental Atlas.

There were also correction areas, where "random observations", e.g., during examinations of adjacent areas, local inspections, analysis of aerial photography or local knowledge on the part of persons involved, etc. had revealed that the land use had changed.

Revision of the mapping units and the classification methods

The descriptions of the mapping units were subjected to detailed examination and in some cases adapted to the changed data bases. Thus, for example, several mapping units were merged, since no distinction was any longer possible using the current data base,² or their differentiation no longer seemed useful for some other reason.³ Certain mapping units which still distinguished between the former eastern and western parts of the city have now either been merged to form uniform categories, or have been re-mapped. In this process, two use categories of built-up areas and six categories of green and open spaces have been abolished and completely reassigned to different categories.

Plausibility checks

Plausibility checks were performed using a database analysis, in which areas with unacceptable combinations of land uses and area types were identified and reviewed. In addition, there has been an evaluation of various spatial data bases that have in recent years been compiled in the Senate

² For example, the categories Mixed Areas with Predominantly Commercial and Service Use, and with Primarily Manufacturing Use were merged for this reason.

³ For example, the use category "camping sites", which had a very small number of areas, was reassigned to the Public/ Special Use category; and also the various forest use categories, including Fallows with Forest-Like Vegetation, were merged to form a single area use category.

Department for Urban Development for a variety of specialized tasks. These data bases were either already available as ISU block data, or they could be merged and compared with the information of the ISU map, and thus provided indications of particular cases in which the use data needed to be examined.

In addition, all areas categorized in the 2008 Edition as Fallows or Construction Sites were subjected to a check, because they were subject to greater change dynamics with respect to structure and vegetation.

Scope of the update

The updated ISU5 map consists of a total of 24,961 areas: 13,087 of which are main blocks and 11,874 block segments. A total of 17,836 areas with built-up use and 8,758 with green and open space use were mapped, so that 1,633 areas showed dual use.

In the current update, 6,239 areas were checked. Of these, 5,010 received a new use assignment. The review included a total of some 23 % of the area of Berlin.

A detailed documentation, which contains not only the report on the current continuation of the real use and urban structure mapping, but also a representation of the conceptual basis, mapping instructions, and a comprehensive description of all mapping units, can be downloaded at the following link:

http://www.stadtentwicklung.berlin.de/umwelt/umweltatlas/download/Nutzungen_Stadtstruktur_2010.pdf (German)

Map Description

Each mapping unit for Actual Use of Built-Up Areas and for the Inventory of Green and Open Space is described separately below.

The Categories for Map 06.01, Actual Use of Built-Up Areas

Block Areas are shown as **Housing** if they are primarily used for residential purposes. Certain residentially related service enterprises, utilities and local green spaces are also included. Residential areas include both the dense inner city areas and the open housing estates at the periphery of the city.

The **Mixed Use Areas** may be similar to primarily residential areas in appearance. However, the housing is more strongly interspersed with commercial and service enterprises (department stores, offices, etc.), cultural facilities and small businesses. In exceptional cases, housing may account for as much as two thirds of the area, but as a rule, commercial, service enterprises and other small businesses predominate.

In some cases, Mixed Use Areas are characterized by a high share of retail enterprises, tradespeople, or small businesses, or extensively used commercial space and the associated sheds, workshops or warehouse/ storage areas, while residential use is clearly secondary, and accounts for only one third or at most half of such an area. If such areas are underused, they may be interspersed with fallow areas.

The negative impact of commercial use on neighbouring residential areas usually ranges between minimal and moderate, but is in some cases high.

Areas with high use intensity and density are known as **Core Use Areas**. They are found exclusively in the central areas of the inner city, and in the main borough centres. These are areas of particular importance for commercial, private and public services, and for cultural and scientific institutions. To some extent, higher-level public facilities, especially federal administrative offices, embassies, etc. in inner-city areas are assigned to this category.

Structurally, major differences are apparent between various parts of the city. The spectrum ranges from late nineteenth century block structures to high-rise buildings built in recent decades. In general, these areas are characterized by high urban density and a high degree of imperviousness.

The characteristics of **Commercial/ Industrial/ Large-Scale Retail Areas** include large industrial buildings, warehouses and storage/ parking areas. The housing share is subordinate, with around one third at a maximum. This category also includes railway freight yards and commercial areas on railway

land, waterside lots of a clearly commercial character (shipyards, boatyards, etc.), as well as large-scale retail and other large-scale commercial operations, including the parking facilities belonging to them. Disturbance due to noise and emissions can be rated from moderate to very high.

Sites of the **Public Use** category include cultural, university and research, health care, administrative, security and law-enforcement facilities, religious institutions such as churches, child care centres and other youth recreational centres, schools and sports facilities. A few children's playgrounds and retirement homes are also included in this category.

Special Use Areas include such areas as the Olympic Stadium and the Messegelände trade fair complex, as well as large restaurants in recreational areas oriented toward group tours.

The sites of the category **Utilities Areas** include power, gas, water, district heating and sewage-treatment plants, and facilities of the waste removal and sewage departments.

Public roadways are not included in the use mapping process. The **Traffic Areas** so described here therefore include primarily the railway lands, private roadways and airfields. Moreover, traffic islands and airports also count as Traffic Areas, to the extent that they are marked on the block maps. "Green spaces associated with traffic areas" – i.e., along roads, rail lines and bodies of water – are also assigned to this category in the mapping process, albeit as dual use areas which are also counted as Green and Open Spaces.

Freight railway stations and commercial areas on railway land are, by contrast, not counted as traffic areas, but are rather assigned to the category Commercial/ Industrial/ Large-Scale Retail.

Parking spaces including parking garages were only considered to be traffic areas if they occupy an entire block. Parking areas with ascertainment sizes exceeding one hectare, but which are located within a single block in combination with other uses (e.g. residential use), are not separated off by a block segment partition, but are rather assigned to the dominant use.

In the Traffic Areas category also includes railway lines and railyards of the urban railway (S-Bahn), the long distance railway and the tram system, and also parts of the underground/subway lines which are outside of the tunnels in open cuts.

The Central Bus Station (ZOB), and the bus and tram depots are also assigned to this category.

The **Weekend Cottages** are by definition not permanently inhabited, and are primarily used for recreation. Those areas assigned to this category in the 1985 Environmental Atlas have been retained; moreover, areas have been assigned to this category if they are used **similarly to allotment gardens**, but are not listed in the inventory of "Berlin Allotment Gardens" as per the Federal Allotment Gardens Law.

Compared to a single family home structures with residential use, these blocks are generally characterized by a smaller structural volume and a smaller-scale subdivision of the lots. Compared with Allotment Garden Areas however, these areas are more densely built-up, and the lots are generally larger.

Areas classified as **Construction Sites** were those with a typical construction site character, as a rule, with barren soil. Once the foundations and first floors of the new building are recognizable, it will be classified according to its planned use. If this is not obvious from the aerial view or from the K5, the matter may be researched at the relevant urban planning office. In the current actual-use maps, the category Construction Site has not been assigned to any block area.

Categories of the Map 06.02 Inventory of Green and Open Space

The category **Forest** includes all wooded areas of the Berlin forests, as well as those wooded stands outside the Berlin forests which appear clearly in aerial photography as self-contained forest stands. The forests include reforested former sewage farms and other fallows with forest-like vegetation.

Not included in this category are forest-like parks, such as the land around Glienicke Castle, which is part of the parkland inventory of Berlin. Such areas have been assigned to the use category Parks/ Green Spaces and to the area type Forest.

Bodies of Water include all natural bodies of water – rivers, lakes, ponds – and also canals, retaining and seepage basins of the Berlin Water Authority, provided they are recognizable as water surfaces or as water engineering structures.

The category **Meadows and Pastures** includes meadows, pastures and enclosures used for agricultural purposes, and also experimental areas used by the universities for similar purposes, and

former sewage fields, regardless of how the products of these fields are used. It is assumed that the use of meadows and pastures can be seen in the aerial photography.

Farmland includes areas identified in aerial photography as being used for agricultural purposes. The difference from Meadows and Pastures is that in this case, the land is periodically sown, fertilized and harvested.

The use categories Meadows and Pastures and Farmland may alternate over the course of only a few years in the same area. For these two agricultural use categories, it is therefore particularly important that the mapping process reflect the current state of knowledge.

The category **Tree Nurseries/ Horticulture** includes both the acreage of private tree nurseries and garden centers, and of borough garden centers and city horticultural schools. These are areas with predominantly outdoor cultivation. Facilities with purely indoor operations are rather assigned to the category Commercial and Industrial Use.

Block areas with borough garden centres, horticultural schools, the work yards of the horticultural offices, and certain research facilities, such as the Institute for Crop Research and the corresponding teaching and experimental fields of the universities, are mapped as dual use together with Public Use/Special Use. Due to their high demand for space, tree nurseries and horticultural facilities are largely located at the outskirts of the city.

In addition to those facilities listed in the SenStadt Directory of Green Spaces, the category **Parks/ Green Spaces** includes other green spaces, if they are similar in appearance to a publicly accessible park facility and are apparently subject to regular maintenance gardening. Thus, for example, well maintained green spaces associated with traffic areas along roads and motorways are assigned to this category, albeit as dual purpose areas with traffic use. Smaller, public-square-like green spaces and playgrounds are also mapped as a Parks/ Green Spaces, provided they are less than approx. one third impervious; otherwise they fall under the category of Urban Squares/ Promenades. Blocks of the use category Parks / Green Spaces are also generally assigned to the area type Parks / Green Spaces. Very extensive parks and recreational facilities characterized almost exclusively by extensively maintained or non-maintained wooded or meadow-like areas are in some cases assigned to the area types Forest or Fallows (e.g., the Glienicke Public Park).

Some special, not freely accessible facilities, such as the Botanical Gardens or the zoos in Tiergarten and Friedrichsfelde, are mapped as Parks/ Green Spaces, but with the dual purpose assignment as Public Use/ Special Use. Other public facilities, too, may be associated with green facilities. These parklands are then not delimited separately, even if their size exceeds the ascertainment limit of one ha. They may be mapped as dual purpose areas, in order to also connote their predominantly "green" character.

By contrast however, private outdoor facilities, playgrounds, etc. in residential areas are not mapped as a Parks / Green Spaces, since they are part of the character of the residential use of those areas, and the open space structure of these blocks is further differentiated in the type assignment (see comments on the [Environmental Atlas Maps 06.07/06.08](#)).

City Squares/ Promenades are the public spaces of urban living. City squares serve as places of sojourn for leisure and recreational purposes, as meeting areas, market places, etc., and are often located in front of railway stations and other representative public buildings.

Promenades are spacious pathways that provide pedestrians and cyclists with space for movement away from road traffic. Promenade may also include some more highly impervious median strips, provided they are not used as parking lots.

Squares and promenades generally have a higher degree of imperviousness than parks and green spaces.

Cemeteries include both areas currently used for burial purposes and former cemeteries, provided they are still recognizable as such.

The data on the inventory of cemeteries in Berlin maintained by the Senate Department for Urban Development is the basis for the scope of these areas. Honorary graves and monuments, on the other hand, are not assigned to the area type Cemetery, although they are recorded in the Berlin inventory of cemeteries; they are mapped as Public/ Special Use, and assigned to the area type Culture.

However, cemeteries are not generally considered areas of Public/ Special Use. Only when usually small-scale blocks are largely occupied by a church building, and the surrounding cemetery is only a subordinate feature will a dual use as Public/ Special Use be assigned, in which case the block is then

assigned to the area type Church. However, if a church or cemetery chapel is located on a large cemetery only in a subordinate function, no dual use is assigned.

Structurally, cemeteries differ from one another mainly in terms of their stock of trees. While older cemeteries and forest cemeteries are essentially characterized by their very old stocks of trees, many newer cemeteries are still largely without larger trees.

The basis for the assignment and delimitation of the category **Allotment Gardens** is the SenStadt map and list of Berlin allotment garden colonies, which record the allotment gardens with appropriate use, as defined by the Federal Allotment Garden Law. Other areas with similar use characteristics are classified as Weekend Cottages with Allotment-garden-type Use.

Fallow Areas are areas currently not in use and not maintained, on which variegated stands of vegetation can often develop. A distinction is made between **Fallows Free of Vegetation** on the one hand, which include mostly excavations, soil or rubble dumps, or demolition areas, where no vegetation has yet taken root, due to the fact that their utilization has only recently been abandoned. In some cases, the site conditions ensure that no vegetation will enter the area for some time. These may be brownfields where little vegetation can grow due to the very high degree of imperviousness, or else sand dunes and beaches, on which spontaneous growth of vegetation occurs only very slowly, due to a lack of nutrients, or to regular disturbances.

Another category of Fallows are **Fallows with Predominantly Meadow-Like Vegetation**. On open brownfield sites, a vegetation of ruderal perennials and grasses often establishes itself during the first few years. Especially on nutrient-poor sites, this vegetation can remain relatively constant over the course of several years. In general, however, unstable conditions prevail.

All brownfield sites which cannot be clearly assigned to one of the other fallow or forest categories are mapped as **Mixed Vegetation – Meadows, Trees, Bushes**. The development of vegetation on a fallow site depends on many conditions, such as the abiotic site conditions, the initial vegetation and anthropogenic influences, so that on long-fallow sites, various successional stages often alternate within a small area.

If on the other hand, an area is covered almost entirely with trees, it will be assigned to the category Forest.

The category **Sports Facilities** includes both covered and uncovered sports facilities. All sports use areas are at the same time mapped as Public/Special Use.

These include not only sports fields, swimming pools and beaches, but also riding, golfing, archery and water sports areas. The latter are characterized by small dockyards, boat hangars, club houses, parking lots, etc., with a high proportion of green space. Clearly commercial water sports areas (dockyards, boat-building facilities, etc.) are assigned to the category Commercial/ Industrial Use. Some fairly extensively used beaches (without changing rooms, kiosks, etc.) are assigned to fallow or forest categories.

The covered sports facilities include primarily those housed in halls, such as indoor pools and ice skating rinks, and also stadiums and multipurpose halls, in which non-sporting events such as concerts may also be held.

Use Distribution for Berlin

The following tables and figures show the **shares of all use types** in relation to the total area of Berlin. It should be noted that **1633 areas** have been assigned both to a land use category of built-up areas (nos. 10 through 90) and to a category of non-built-up areas (nos. 100 through 200).

With this approach, major potential green and open space areas can be documented on other use areas. This applies particularly to Public / Special Use sites, Utilities facilities, Commercial/ Industrial areas and Traffic areas. These areas are shown on both maps, i.e., double (cf. the explanations of dual use in the Methodology section).

Since for the evaluation of area shares, each area only once can be considered once, both cases–**green priority and construction priority** – have been calculated separately.

The calculations are based on the area size data of the ISU. The block areas were calculated from the Geographic Information System (GIS) based on the block segment map ISU5.

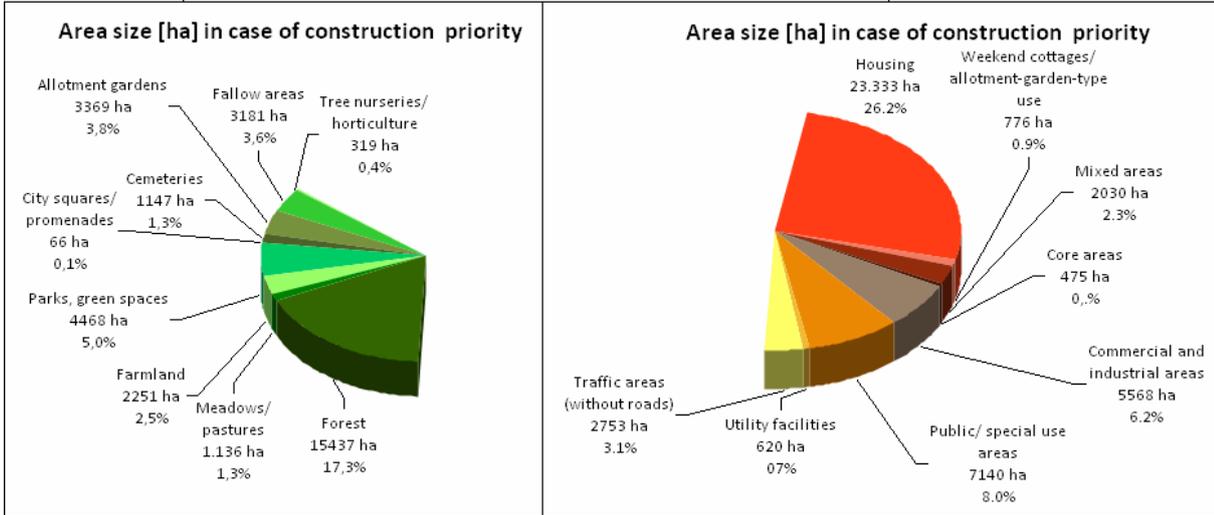
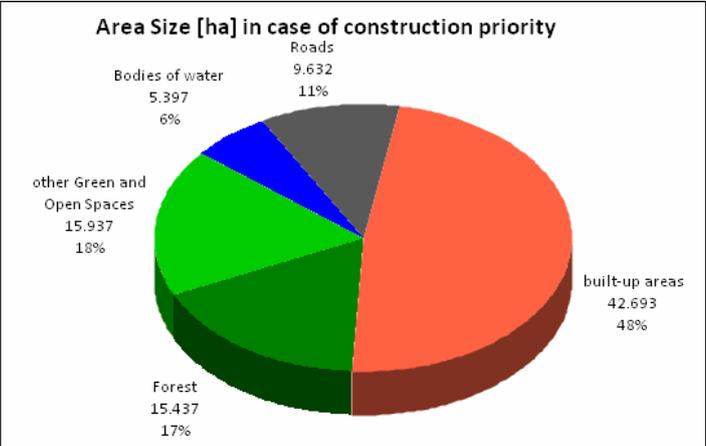
Table 2 shows the absolute and percentage area shares of different uses of the **total area of Berlin**.

Table 2: Area shares accounted for by various uses in the total territory of Berlin

Use		No. of blocks in case of green priority	No. of blocks in case of construction priority	No. of dual-use blocks	Area size [ha] in case of green priority	Area size [ha] in case of construction priority	Percentage distribution [%] in case of green priority	Percentage distribution [%] in case of construction priority
see 1)								
10	Housing	11.104	11.104		23,333	23,333 ha	26.2	26.2
70	Weekend cottages/ allotment-garden-type use	243	243		776	776 ha	0.9	0.9
21	Mixed areas	874	889	15	1991	2030 ha	2.2	2.3
30	Core areas	285	285		475	475 ha	0.5	0.5
40	Commercial and industrial areas	1159	1.247	88	5265	5568 ha	5.9	6.2
50	Public/ special use areas	1581	2.305	724	4455	7140 ha	5.0	8.0
60	Utilities area	101	120	19	544	620 ha	0.6	0.7
80	Traffic areas	855	1642	787	1723	2753 ha	1.9	3.1
100	Forest	2692	2.607	85	15,772	15,437 ha	17.7	17.3
121	Meadows/ pastures	205	202	3	1142	1136 ha	1.3	1.3
122	Farmland	177	173	4	2277	2251 ha	2.6	2.5
130	Parks, green spaces	1941	1461	480	4970	4468 ha	5.6	5.0
140	City squares/ promenades	218	106	112	114	66 ha	0.1	0.1
150	Cemeteries	189	187	2	1148	1147 ha	1.3	1.3
160	Allotment gardens	785	774	11	3386	3369 ha	3.8	3.8
171-173	Fallow areas	1251	858	393	4441	3181 ha	5.0	3.6
190	Sports use	538		538	1909	0 ha	2.1	0.0
200	Tree nurseries/ horticulture	96	91	5	346	319 ha	0.4	0.4
110	Bodies of water	667	667		5397	5397 ha	6.1	6.1
	Roads				9632	9630 ha	10.8	10.8
	Total, without roads	24,961	24,961		79,464	79,466	89.2	89.2
	Total of Berlin, incl. waters and roads				89,096	89,096	100	100

The calculations are based on the area measurement information of the ISU. The block areas were calculated from the GIS. The total of space used for roads is obtained from the difference between the total of all block areas, and the total area of Berlin. 1) 1633 areas have dual use, i.e. these areas were assigned both to a category of built-up areas (10 – 90) and to a category of non- built-up areas (100 – 200).
As of Dec. 31, 2010

**Table 2: Area shares accounted for by various uses in the total area of Berlin
Area sizes based on block segment map ISU5**



**Fig. 1 a+b: Shares of the various use categories of the total built-up area of Berlin,
Sizes of areas based on ISU5, block segment map, construction priority**

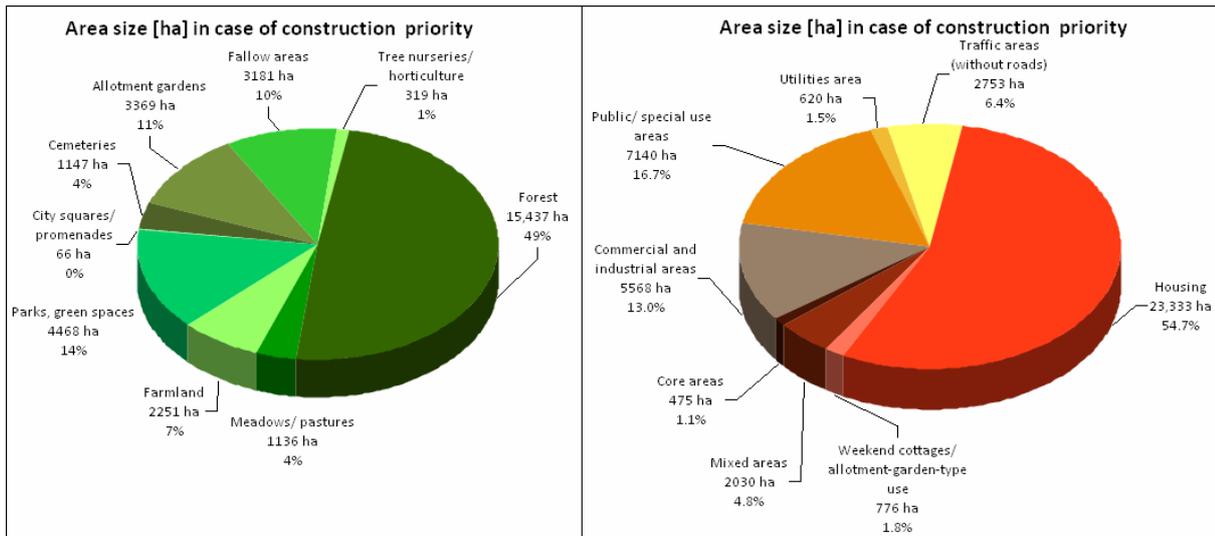


Fig. 1: Shares of the various use categories of the total stock of green and open space, and of the total built-up area of Berlin, respectively
 Sizes of areas based on ISU5, block segment map, construction priority

In terms of the absolute area of all Berlin boroughs and ha, the following overview emerges:

Tab. 3: Use distribution in the Boroughs, in ha and in per cent, in case of construction priority

Borough	Total area [ha]	Total areas, without roads [ha]	Construction use										Inventory of Green and Open Spaces										Bodies of Water	
			Housing	Weekend cottage/allotment-garden-type use	Mixed area	Core area	Commercial/industrial area	Public special uses	Utilities	Traffic area	Roads	Forest	Meadows/pastures	Farmland	Parks/Green spaces	City squares/Promenades	Cemeteries	Allotment gardens	Fallow areas	Fallow areas, no vegetation	Fallow areas, mixed vegetation	Tree nurseries/horticulture	Bodies of water	
1 Mitte	3845	3183	791	10	301	129	260	716	19	141	762,6	14	0	0	442	22	93	73	33	15	0	18	6	133
2 Friedrichshagen-Kreuzberg	2032	1608	540	0	184	23	159	273	8	84	424,3	0	0	0	131	8	48	6	15	2	13	0	2	128
3 Prenkow	10312	9253	2469	348	184	13	620	709	13	223	1059,3	992	423	1151	397	1	187	559	818	3	252	563	38	109
4 Charlottenburg-Wilmersdorf	8471	8546	1348	4	279	87	181	863	29	272	925,8	1537	0	0	307	8	75	337	158	13	4	141	24	257
5 Spandau	8185	6489	1993	108	94	14	730	948	140	119	696,1	1653	207	371	515	2	93	226	332	2	138	192	58	835
6 Steglitz-Zehlendorf	10253	9224	3036	17	269	14	225	862	28	196	1038,4	2432	19	0	506	1	121	332	200	18	3	179	18	1060
7 Tempelhof-Schöneberg	5309	4533	1893	6	171	19	744	373	44	253	775,9	56	15	45	233	5	119	254	246	0	224	22	36	31
8 Neukölln	4494	3894	1836	18	146	10	359	308	17	96	599,9	0	20	36	339	2	118	431	48	4	33	11	39	65
9 Treptow-Köpenick	16768	15663	2940	57	121	34	782	814	123	320	1104,4	6748	5	93	303	6	77	504	698	20	303	375	46	1990
10 Marzahn-Hellersdorf	8180	5303	2593	7	62	82	476	387	94	225	876,9	84	7	57	635	3	33	160	307	4	136	167	23	87
11 Lichtenberg	5216	4627	1280	10	91	45	581	726	73	232	589,1	13	202	391	230	2	72	302	279	20	73	186	16	81
12 Reinickendorf	8931	8141	2614	111	138	22	450	461	33	593	789,2	1907	157	106	429	4	111	285	46	1	5	40	24	651
Total	89996	79464	23333	776	2838	475	5568	7140	628	2753	9631,6	15437	1136	2251	4468	66	1147	3369	3181	102	1184	1895	319	5397

The calculations are based on the area measurement information of the ISU. The block areas were calculated from the GIS. The total of area used for roads is obtained from the difference between the total of all block areas and the total area of Berlin. 1633 1633 areas have been assigned both to a land use category of built-up areas (nos. 10 through 90) and to a category of non-built-up areas (nos. 100 through 200). In this assessment, priority has been assigned to construction in case of dual use (construction priority).
 As of Dec. 31, 2010

Table 3: Area shares of different uses of the total area of Berlin
 Area sizes based on the block segment map ISU5, construction priority

A presentation of the distribution of use types among the boroughs in absolute terms in ha, and a relative terms in % of the area of the borough, is shown in Figures 3 and 4.

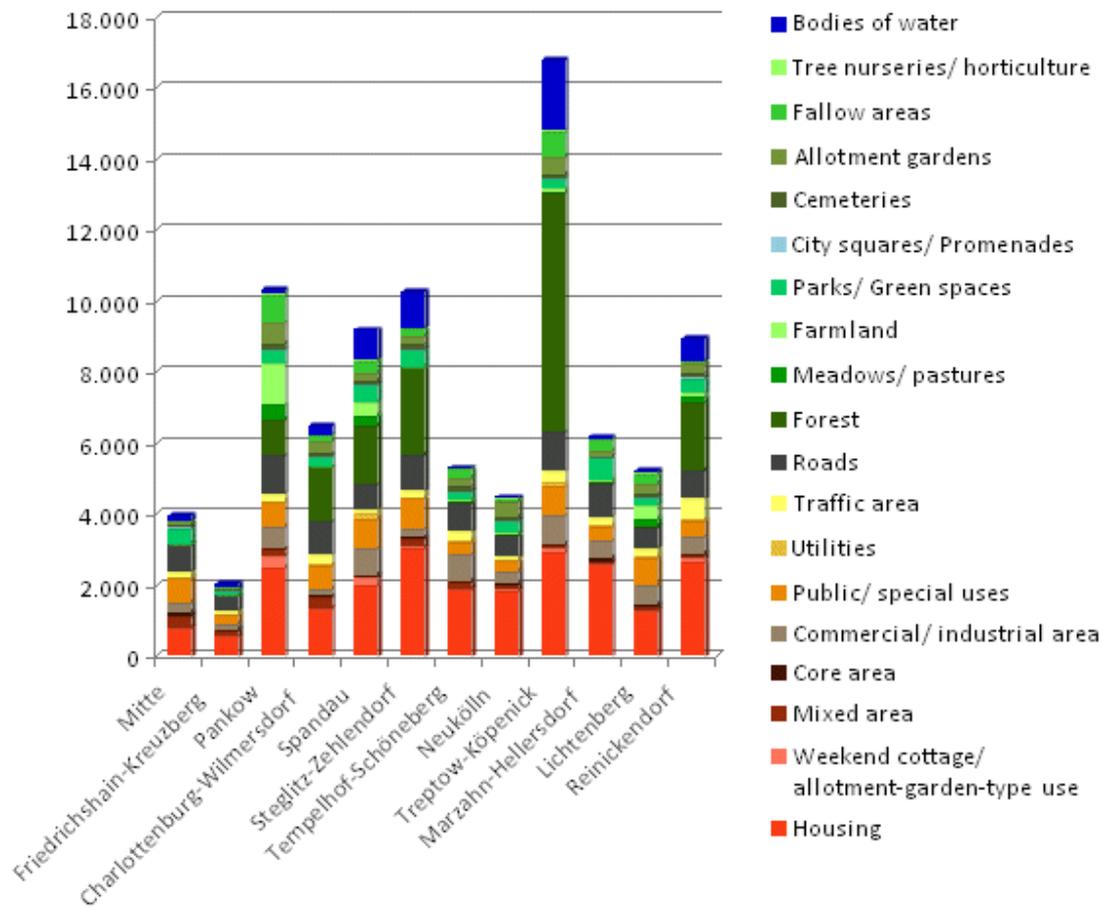


Fig. 3: Shares of the various use categories of the total built-up area of Berlin, height of areas based on ISU5, segment block map, construction priority

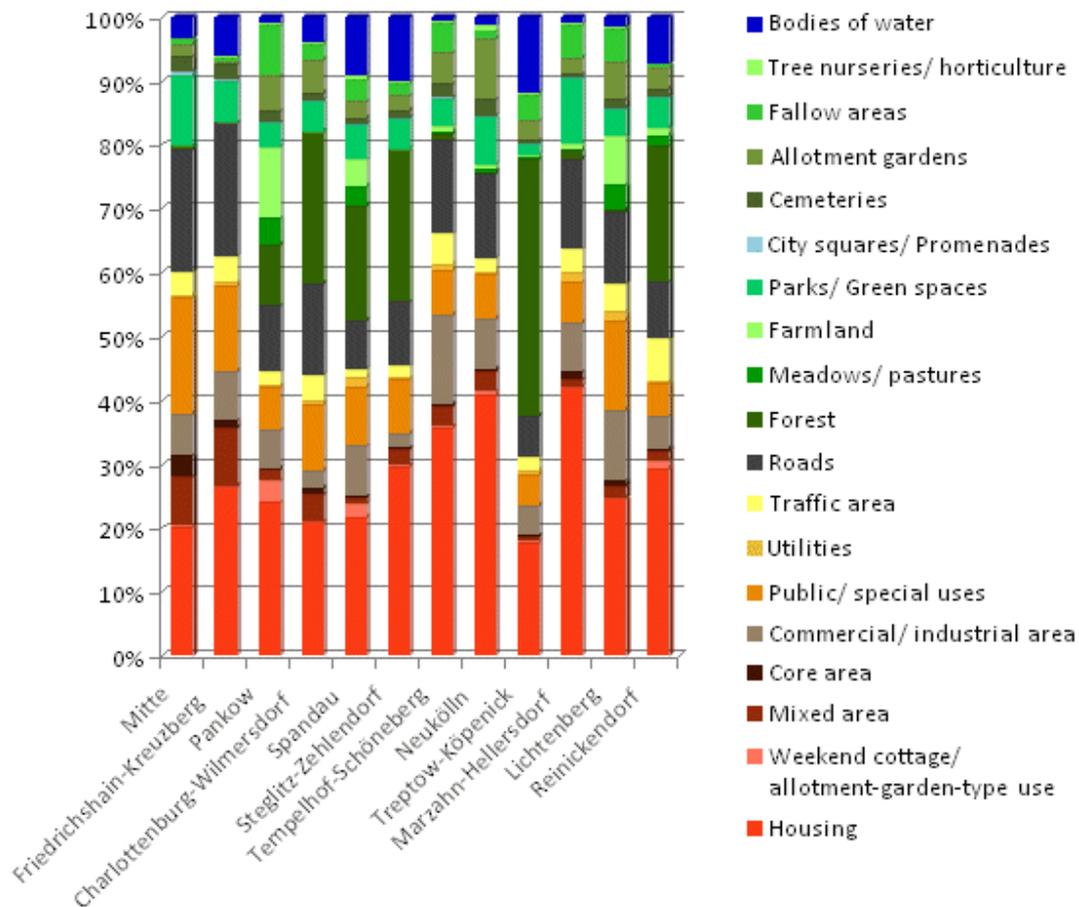


Fig. 4: Shares of the various use categories of the total built-up area of Berlin in %, area sizes based on segment block map ISU5 , construction priority

Description of Map 06.01 Actual Use of Built-Up Areas

Map 06.01 Actual Use of Built-up Areas shows the different use categories by their shares of the built-up area of Berlin and their distribution throughout the city area (as of December 31, 2005-12-). Figure 5 elucidates the distribution of the use shares further.

More than the half of the built-up area of Berlin is used for **Housing**. **Small-Business and Industrial Areas and Public Facilities** account for 12% and 16%, respectively – still a relatively large share of the built-up area of Berlin. The **Traffic Areas** are next, without the roadways not shown as traffic areas, with 6%, and then the **Mixed Use Areas**, with approx. 5%. Very little space is taken up by the Core Areas, Utilities Areas, Traffic Areas, Weekend Cottage Areas and Allotment Garden Type Use. The current map contains no block areas mapped as Construction Sites.

In the distribution of the use categories of built-up areas within the urban area, characteristic structures can be recognized. Thus, purely residential or commercial areas exist in the **outskirts** areas much more frequently than within the City Rail Circle Line; the Mixed and Core Area use categories are more heavily represented in the latter. Commercial Areas are particularly concentrated along waterways and railroad lines, due to the more favourable transport conditions. One often finds Mixed Areas and scattered Core Areas in the **old village centres** in various parts of the city. Particularly characteristic is the concentration of the Core Areas in both the western city centre around Kurfürstendamm/ Tauentzienstraße, and in the eastern city centre area of Alexanderplatz/ Friedrichstraße. Public Use Areas are distributed throughout the entire urban area relatively evenly. Utilities Areas occur mainly in the outskirts, frequently in the vicinity of commercial areas.

The described structures are also reflected in a comparison of the distribution of the land use categories within the boroughs (cf. Fig. 5).

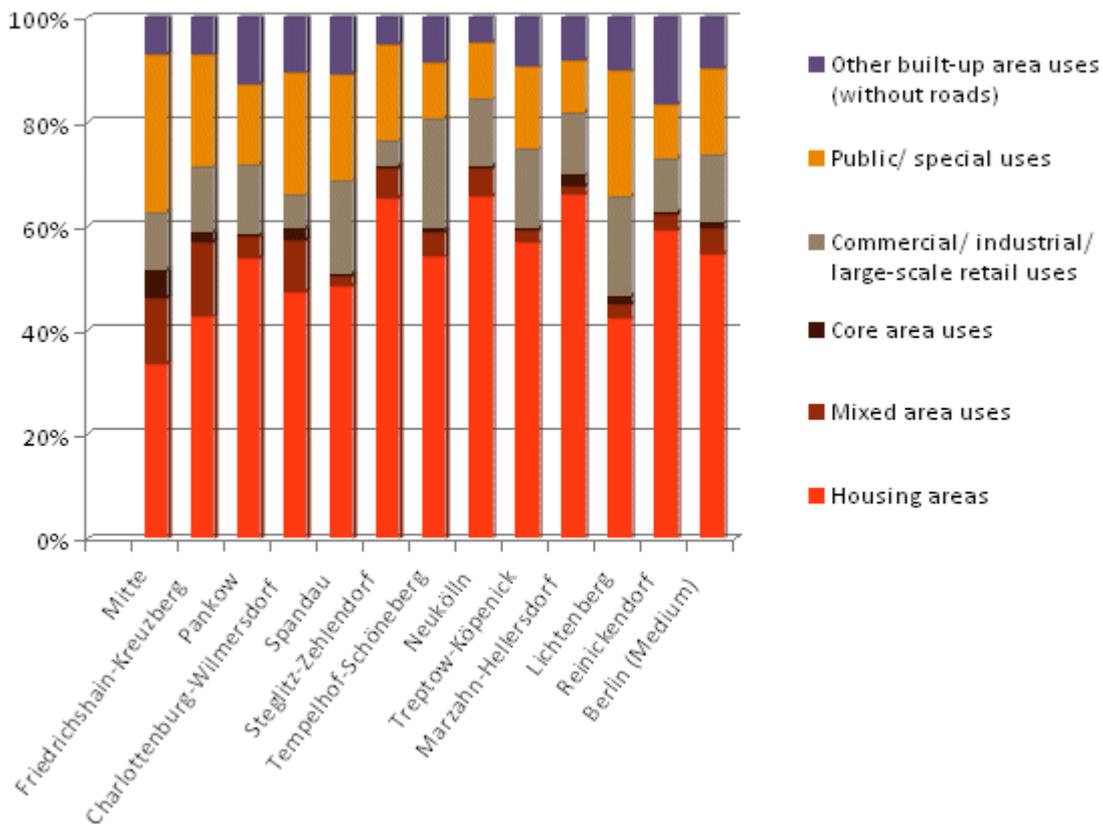


Fig. 5: Shares of selected use categories in the built-up areas of all Berlin boroughs, with area sizes based on the block segment map ISU5, construction priority

Examples for the characteristic use distribution in the **outskirts** areas are the boroughs of Marzahn-Hellersdorf and Reinickendorf, with 63 % and 60 % residential use and 13 % and 10 % industrial use, respectively, while in the borough of **Mitte**, the borough's central functions are reflected by its shares of only 33 % Housing Areas, but more than 5 % Core Area use and approx. 13 % Mixed Area use, as well as a high share of Public Use Facilities (30 %).

This function is not shown so clearly for the western city centre around Kurfürstendamm/ Tauentzienstraße, with Core Area shares of only 2 % or less, since that core area is distributed among the three boroughs of Charlottenburg-Wilmersdorf, Mitte and Schöneberg-Tempelhof.

The **inner city boroughs** of Friedrichshain-Kreuzberg and Charlottenburg-Wilmersdorf have relatively low shares of residential area, with 42 % and 47 % respectively; correspondingly, the share of public use facilities is very high, with 22 % and 23 %, respectively. Friedrichshain-Kreuzberg and Mitte are the boroughs in which the largest shares of the original **mix of uses** are most clearly apparent. They are the boroughs with by far the largest Mixed Use shares (15 % and 13 %).

Zehlendorf-Steglitz (65 % residential use) stands out as a **residential borough** with a low share of commercial use (5 %).

Changes compared with the previous edition

A **direct comparison** with the figures of the 2008 Edition is **only partially possible**, since on the one hand, the descriptions of the mapping unit have undergone extensive examination, and have in many cases been adapted to the changed data bases. In this context, e.g., the three previous categories of mixed-use in the actual use mapping process have been merged. For another, the rules on the admissibility of dual use, as well as to the admissibility of combinations of various land uses and land types have been analysed, and the data base checked for plausibility and consistency on the bases of these rules. To what extent changes in the area shares of the respective uses are due to methodological reasons, and not to actual use changes, cannot be precisely quantified. It is likely, however, that the area share due to actual use changes is considerably less than the methodologically related changes.

For example, one determination was that all sports related uses on the Green and Open Space map were also to be assigned to the **Public/ Special Use category** of the actual use map, which was previously not consistently the case. Much of the increase in Public / Special Use areas is very likely due to this methodological change.

The increase in **Commercial and Industrial Areas** too is at least partially due to a methodological change: All areas that in the 2008 Edition been assigned to the Public / Special Use category and at the same time to the area type Postal have in the 2011 Edition been assigned to the Commercial and Industrial Use category. In addition, the central market halls and port facilities that were previously mapped as utility facilities, also are now assigned to that category.

Another example of a methodologically caused change in the area shares where the increase is the **Weekend Cottage Areas**. In the course of the review, it was established that only those areas were to be included in the Allotment Gardens category of the map of Green and Open Space use which are included in the Senate Department for Urban Development Berlin's Inventory of Allotment Gardens. All other areas the visual appearance of which in the aerial image was similar to that of allotment gardens, but which were not listed in the inventory of allotment gardens of Berlin, were now to be transferred to the category "Weekend Cottages and Allotment-garden-type Uses". This change of relatively large areas – based on the two use categories concerned – of the map of Green and Open Space Uses to a category of built-up areas moreover caused the share of built-up area to increase slightly, without an actual change of use having taken place.

The significant decrease in traffic areas in the borough of Tempelhof-Schöneberg, which also involves a decrease in traffic areas of the city as a whole, was however due mainly to the closure of Tempelhof Airport – i.e., to an actual change in use. As a result, the fallow land between the runways, etc., is now no longer assigned to dual use as a traffic area. The share of road surfaces has thus been reduced here, with no reduction of imperviousness or other modification of the land having taken place.

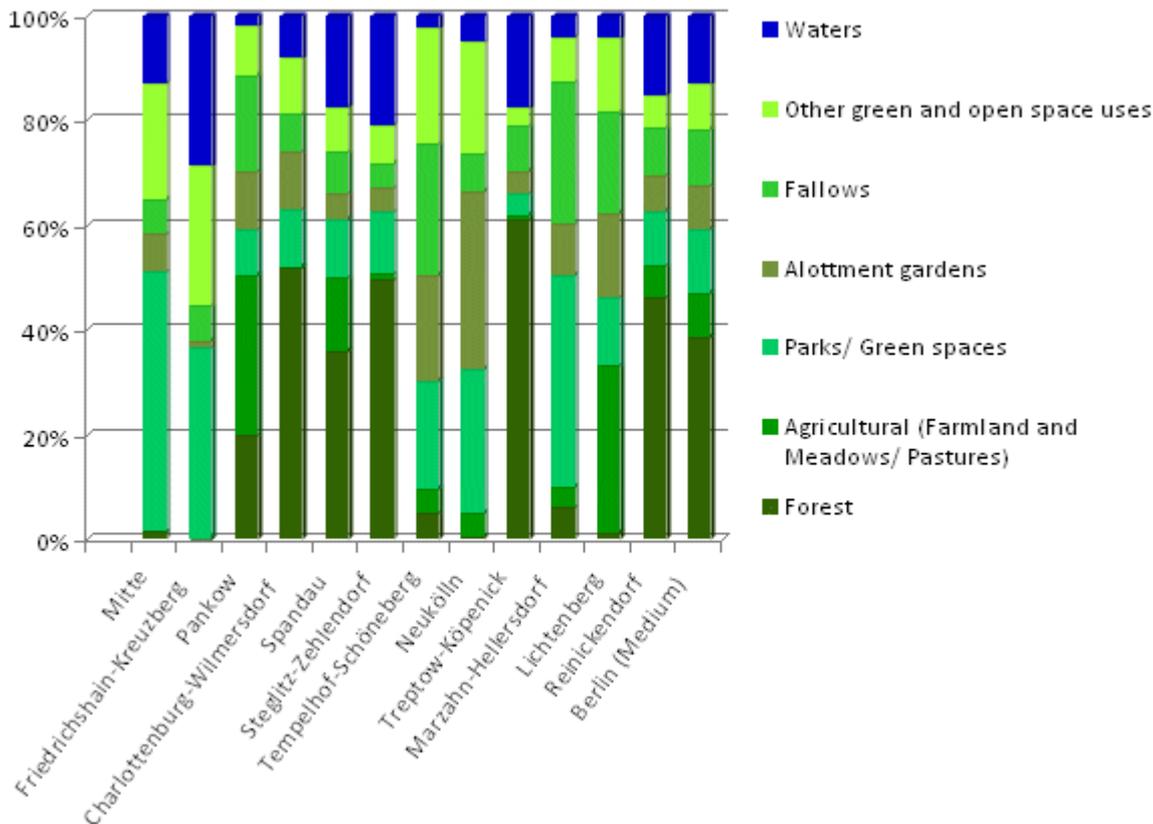
Description of Map 06.02, Inventory of Green and Open Spaces

Map 06.02, Inventory of Green and Open Spaces, shows the different use categories and their shares of the non-built-up areas of Berlin, as well as their distribution throughout the city.

The largest share of the Inventory of Green and Open Spaces is located in the **outskirts** of the city, including particularly the large wooded areas of the Grunewald and Düppel forests in the southwest, the Spandau and Tegel forests in the northwest, and the large forest areas in the borough of Köpenick in the southeast of Berlin. Forests account for 39% of all Green and Open Spaces. Bodies of water account for 13% (cf. Fig. 6).

Agriculturally-used areas, which account for almost 9% of the inventory of open space, are found particularly in the north-eastern area (Pankow and Weißensee). Other agricultural areas are located in the eastern, southern and western outskirts. **Allotment Gardens**, which account for some 12% of the open space inventory, are found almost exclusively outside the City Rail Circle Line, in the outer boroughs. Often, they are located near canals, rivers and railroad lines. The currently unused **Vacant Areas** are distributed throughout the entire urban area, particularly along railroad lines and bodies of water, as well as current and former airports; they account for some 11% of the total open space. **Tree Nurseries** and **Horticultural areas** are found only in the outskirts, while **Sports Facilities**, **Cemeteries**, and **Parks and Green Spaces** are located throughout the entire urban area.

The area sizes of the open spaces increases as one moves from the inner city area toward the **outskirts**. Moreover, in the outer areas of the city, the various categories of open space are often located adjacent to one another, and thus form larger contiguous open systems, while the various open areas in the inner city usually occur in isolation, and are surrounded by built-up areas. In the **inner-city boroughs**, the inventory of open space is dominated by parks.



*Fig. 6: Shares of selected use types of green and open areas in the Berlin boroughs
Area sizes based on the block segment map ISU 5, green priority*

Changes compared to previous issue

As mentioned in the previous chapter, a **direct comparison** with the figures of the 2008 Edition is **only possible to a limited degree**. In the map of the Green and Open Spaces, too, the mapping units have undergone a revision. For example the three previous allotment garden categories, as well as the two forest categories were each combined into one category. The use category Camping Sites was abolished completely in the context of the current revision.

As mentioned in the description of the Actual-Use Map of Built-Up Areas, the decrease in the category **Allotment Gardens** is an example of changes in area shares due to methodological reasons. All areas the visual appearance of which in the aerial photography was similar to that of allotment gardens, but which were not listed in the Inventory of Allotment Gardens of the State of Berlin, have now been transferred to the category Weekend Cottages and Allotment-Garden-Type Uses of the Actual-Use Map of Built-Up Areas.

The relatively sharp increase in the category **Parks/ Green Spaces** is probably also due to methodological changes: the targeted evaluation of the directory of green spaces maintained by the Senate Department for Urban Development resulted in a number of areas which had previously been mapped as forest or fallow land, were now assigned to the category of Parks/ Green Spaces.

Overall, we cannot reliably determine the extent to which changes in the area shares of the respective uses have been due to methodological factors and not due to actual use changes, so that a quantified evaluation makes no sense in this regard.

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