

Urban qualities for dense mixed-use spaces. Theses, case studies and a toolbox for integrated tangible urban planning.

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Abstract. The built environment is under pressure. Climate change, migration and social inequalities challenge previous urban planning concepts and will change our cities. The task is to transform the sustainable city of the future into a climate-friendly and socially just living space. Solving these challenges requires an integrated quality discourse with all actors based on tangible structural-spatial situations. In the BBSR research project “Qualities of Urban Zones”, contributions for an early in-depth quality discourse were developed based on the new building zone category “urban zones”. Urban zones are regarded as a future-oriented concept for sustainable densified districts and a diverse, ever-changing mix of uses. This paper presents the specific context and main findings as “theses of urban quality” as well as potential applications for MU. The authors propose guidelines to improve process quality and illustrate exemplary tangible structural-spatial as well as process-related “design elements”. A toolbox with instructions and templates to design and implement scenario-based workshops supports an integrated quality discourse in urban development.

Keywords: Urbanism, densification, urban development, urban zoning, hybrid use, quality discourse, integrated planning approach, tangible urban design elements.

1. Urbanisation. Context and initial situation

Climate change, migration and social inequalities challenge urban planning concepts and will change our cities. The task is to transform the sustainable city of the future into a climate-friendly and socially just living space which can adapt to dynamic change and provide a meaningful home to its inhabitants.

1.1. European Approach: “Leipzig Charter”

The values of the Leipzig Charter [1] describe approaches and strategies for the development of sustainable European cities to achieve environmental stewardship, resource efficiency and quality building development. The charter formulates socio-spatial goals such as a high-level *Baukultur*³ as an overall quality of planning, building and the promotion of instruments for integrated urban development.

³ Integrated building, planning and construction culture [1].

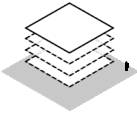
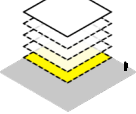
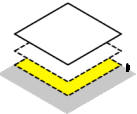
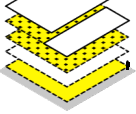
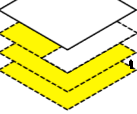
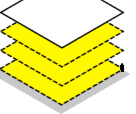
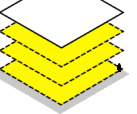


Taking the “transformative power of cities for the common good” [2] into account and complementing socio-economic diversity as well as integrated planning and design processes, the new Leipzig Charter [2] explicitly mentions the need for flexible, adaptable urban systems and robust cities. Integrated urban development “with a place-based, multi-level and participatory approach” [2] is seen as the key factor of transformation and for “reducing and preventing new forms of social, economic, environmental and territorial inequalities” [2]. With the rise of new directives for urban transformation (e.g. the just city, the green city, the productive city), quickly-changing global phenomena and the demand for compact, dense and multi-functional settlement structures [2], the complexity and pace of change call for new forms of participation, planning and practical implementation.

1.2. Effective changes in German building law “Urban Zoning”

In 2017, “urban zones” were introduced in the German *Baunutzungsverordnung* (BauNVO) to support new ways of coexistence and to strengthen mixed-use in a compact urban structure. These urban zones (MU) give investors, developers and planners a new planning instrument in urban land use planning. MU can be used in new development areas as well as rezoning. They also can help to reduce resource and land consumption by increasing building density (compared to residential and mixed-use zones) and helps to facilitate a short-distance city. MU also helps municipalities to develop building land in urban areas (e.g. due to lower noise policies). In comparison with the most common building zone categories, MU can be classified regarding the type and measure of building use [3]:

Table 1. Classification of MU in comparison to the most common building area categories according to the German *Baunutzungsverordnung* [3]. Measure of building use (GRZ, GFZ, BMZ) and specifications for the mix of uses. Non-residential uses coloured yellow, exemplary change of use dotted.

						
Common residential zone (WA)	Special residential zone (WB)	Mixed-use zone (MI)	Urban zone (MU)	Central zone (MK)	Commercial zone (GE)	Industrial zone (GI)
GRZ 0,4 GFZ 1,2 <u>Residential</u> with supply, social, cultural, ecclesiastical, sports, health facilities.	GRZ 0,4 GFZ 1,6 <u>Residential</u> , commercial use optional (only in case of existing functional mix).	GRZ 0,6 GFZ 1,2 <u>Balanced mix of residential and commercial use</u> (according to character of the area).	GRZ 0,8 GFZ 3,0 <u>Mixed-use of residential and other uses without necessary balance, dynamically changeable.</u>	GRZ 1,0 GFZ 3,0 <u>Trade and commercial use</u> , limited residential use possible (according to character of the area).	GRZ 0,8 GFZ 2,4 BMZ 10,0 <u>Residential use only as an exception</u> (e.g. possible for supervisors or owners).	GRZ 0,8 GFZ 2,4 BMZ 10,0 <u>Residential use only as an exception</u> (e.g. possible for supervisors or owners).

GRZ = building coverage ratio; GFZ = floor area ratio; BMZ = cubic index value.

The measure of building use in MU defines a building coverage ratio (GRZ) of 0.8 and a floor area ratio (GFZ) of 3.0 as maximum limits. These limits may be exceeded if compensation is provided and requirements for healthy living and working situations are not compromised [3].

The type of building use in MU includes residential as well as commercial use, administrative facilities and social, cultural and other facilities (e.g. for ecclesiastical, health and sports purposes) that do not significantly interfere with residential use. The mix of residential and other uses does not have to be equally weighted and can thus change over time (according to the current legal situation in 2020). As an exception, places of entertainment or gas stations may be permitted. In MU or their parts, the location

of residential use can be further defined (e.g. not on the first floor on the street side or only above a certain floor). For residential use as well as for commercial use, a certain proportion or size of floor area can also be specified in the development plan. [3]

Noise immission values outside of buildings must not exceed 63 dB(A) during daytime (exceeding the maximum values for mixed zones and core zones by 3db(A)). At night-time, maximum immission values are 45 dB(A) for mixed zones, core zones and MU. [4]

2. Motivation and research approach

2.1. *Striving for urban resilience*

MU give developers, investors and planners a tool in urban land use planning that breaks new ground in terms of building density, mix of uses and noise regulations. The challenge is now to integrate today's needs as well as unknown future demands into the planning process. If use and mix are to remain versatile over a long period of time, robust urban planning is essential and must include buildings, infrastructure and free spaces that are and will be capable of development – holistic “urban resilience”.

The BBSR⁴ research project aimed to identify the potential as well as advantages and consequences for utilisation phases of MU in the context of urban renewal and development – with focus on planned interspaces and structural-spatial design of buildings as well as future development of MU.

Urban resilience describes the ability of an urban system and its population to respond well in the face of extreme events, ongoing crises, or elemental changes, while adapting and transforming itself towards sustainable urban development. “Resilience is the measure of a system's vulnerability, robustness and ability to act. The system overcomes stressors, can self-renew and evolve and therefore emerges strengthened” from the situation [5]. “Urban resilience is always manifested in spatial contexts” [6]. It describes building capabilities to actively shape ongoing adaptations and strategic transformations and is not to be confused with resistance [5].

Following N. J. Habraken, it is referred to the corresponding architectural concept as “open architecture” [7]. In the past, “the focus used to be on durability. The present emphasis is on the versatility and rapid responsiveness of the built environment to new challenges” [5]. “Hybridisation strategies” can make an important contribution to promote those resilient characteristics that are required in times of uncertain developments [8].

2.2. *Presentation of findings*

The findings presented in this paper address aspects of cross-level learning in urban development in the sense of a multi-level, multi-stakeholder learning *Baukultur*. Results cover examples for an integrated approach, co-creation of manifold actors and stakeholders, place-based analysis, site-specific intervention and (public) free space as identity-giving element of the urban fabric. All these aspects relate strongly to the new Leipzig Charter [2].

Drawing on the progression of insights, findings will be presented in sequential order. Building on systematic literature research and an evaluation of nine European best practice examples, seven theses of urban qualities were derived. The theses served as basis to develop spatial visions for five case studies of different project developments that implement MU. In interviews and scenario-based workshops, it was possible to gain initial in-depth insight into the current practice on MU and to have engaged discussions with involved actors. This paper also proposes a “project toolbox” as means to implement the gained understanding in discussion and negotiation processes in MU planning practice. It contains instructions and templates to design and implement “scenario workshops” with engaged actors for the benefit of the quality debate in early stages of project development.

3. Urban qualities / Theses derived from literature and best practice analysis

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The selection of literature and best practice examples as well as the collection of relevant statements was carried out along observation levels (building / structure including use, urban space pattern / building volumes, interspace / free space / environment, interfaces to neighbouring areas, energy concept / mobility concept, process characteristics / instruments, stakeholders / actors, motives).

3.1. Literature analysis

The respective body of literature consists of numerous catalogues of characteristics and criteria for reasonable planning and urban design of densified spaces. With regard to MU, publications highlighting measures and characteristics of increased dense and mixed quarters were most relevant, as was information about the consideration of a future change and emerging conflicts (e.g. noise) and statements on functional, structural-spatial and process-related qualities. Around 30 international publications were evaluated (e.g. certification systems, standard works, research publications) and about 350 factors were identified (incl. some duplicates), assigned to levels of examination, thematically coded and clustered.




It is repeatedly emphasised that no finite checklist should be formulated for urban qualities [9]. Specific local frameworks and (unpredictable) future change are substantial reasons for not defining a general ideal model of mixed-use either [10,11]. It is also mentioned that concepts and reality often develop in opposite directions. This contradiction arises from the fact that urban development and planning instruments are persistently used but cannot provide an answer to this discrepancy [12].

A key challenge is to break from existing patterns of action in favour of a resilient built environment capable of change.

3.2. Best practice analysis

To bridge the gap between vision and reality, nine development areas were selected for best practice analysis. The development areas are recognised by experts as being of high quality, some of which have won awards. They illustrate examples how mixed-use and densification can become reality in urban development while offering a high quality of life for the population. The examples were selected on the basis of the availability of information and with the aim of capturing as wide a spectrum of variation as possible (e.g. site size, MU percentage, degree of mixed-use, geographical distribution).

Table 2. Figure-ground plan, data and exemplary “highlight” characteristics of best practice areas (selection). Scale approx. 16,000, north-oriented, water areas coloured blue. Created based on OpenStreetMap. (© OpenStreetMap contributors, 2020. Accessible under Open-Database-Licence, www.openstreetmap.org/copyright).

		
Kalkbreite, Zürich (CH)	Stadtreial, Ulm (DE)	Seestadt Aspern, Wien (AT)
Area size: 6,725 m ²	Area size: 35,000 m ²	Area size: 2,400,000 m ²
Floor space: 23,000 m ²	Floor space: 38,800 m ²	Floor space: 2,600,000 m ²
72 % residential use,	50 % residential use	80 % residential use
28 % commercial use	50 % office use	20 % other uses
GRZ = 1,0	GRZ = 0,6 to 0,8	GRZ = 0,5 / GFZ = 2,6 to 3,5
GFZ = 2,82	GFZ = 3,0	(GFZ partially up to 5,0)
Start in self-organisation with 50 people and more than 100 events,	Conversion of commercial area, construction stages increased	Attractive landscape sequence, ring road as recreational space and

lobbying with politics & authorities, acceptance (= proof of demand), cooperative (shares & participation), residential property, commercial low floor area consumption per person (31 m ²) plus common areas, simple building standard, compact volume, energy efficient standard.	rental space, room heights for flexible use, renaturation of river-bed, federal/state funding, energy efficient standard.	horizontal connection, room heights for flexible use, climate-neutral with 40 % of pedestrian / bicycle traffic, 50 % of the area for lake / park / green areas / development, property mix (building groups / cooperatives).
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3.3. *Theses of urban quality*

It became apparent that many factors for urban quality found in the literature support the values of both Leipzig Charters and are also used in the evaluated best practice examples. The following seven theses of urban quality were derived from literature and best practice analysis [*in italic*]. They compose a series of focus topics and are subject to contextual overlapping.

Thesis 1 / People + open space = living space. People are at the heart of the built environment. Buildings and open spaces equally define private and public living space. Buildings and open spaces are functional and create space for appropriation and use. The structural design considers human perception and comfort requirements. [13-16] [*Richti-Areal, Zürich-Wallisellen. Seestadt Aspern, Wien. Im Lenz, Lenzburg*]

Thesis 2 / Diversity + Use + adaptability. A city consists of the diversity of its inhabitants as well as the mix of its urban functions (living, working, education, utilities and recreation, etc.). Buildings and open spaces with the capacity for multiple uses allow for shorter distances and simplify everyday situations. [8,12,15,17-20] [*Richti-Areal, Zürich-Wallisellen. Seestadt Aspern, Wien, Stadtreial, Ulm*]

Thesis 3 / Scaling of functions + atmosphere. Use, functions and atmosphere can be controlled and scaled at different levels of scale. The urban fabric ranges from region to city, from neighbourhood to settlement and from single building complex to individual building up to a specific unit of use and an individual room. [10,15-17, 21-26] [*Kalkbreite, Zürich. Bo01, Malmö*]

Thesis 4 / Appropriation + identity. Buildings, interspaces and free spaces offer options for appropriation. Residents and users can and may leave recognisable traces through their use and create their own identity. This identity may change over time and may be overlaid by new layers or lead to (temporary) changes in built structures. [13,25] [*Vulkan, Oslo*]

Thesis 5 / Open architecture + open architects. An adaptable, open architecture of buildings and open spaces, together with an open mindset of architects and stakeholders is the basis for meaningful participation and suitable appropriation of a resilient built environment. To cope with the increasing complexity of urban developments and multiple overlapping demands from activities, functions, or meanings and to make synergies usable, transdisciplinary processes⁵ are needed to analyse causal systems, challenges and conflicting goals in an integrated planning practice. [22,26]

Thesis 6 / Navigation in the network of actors. The development of dense urban areas results in a complex variety of uses, actors and framework conditions. For successful navigation in the network of actors, administrations and legal frameworks, an overview of the causal system is important. In the sense of the actor-network theory, buildings, open spaces, city squares and streets are among the actors of the city, in addition to known actors who are already very diverse⁶ [27]. [22,28,29] [*Seestadt Aspern, Wien*]

⁵ A transdisciplinary approach includes conscious crossing of disciplinary boundaries as integrated participation of all actors and creates a much greater overlap, often resulting in better understanding and more innovative ideas.

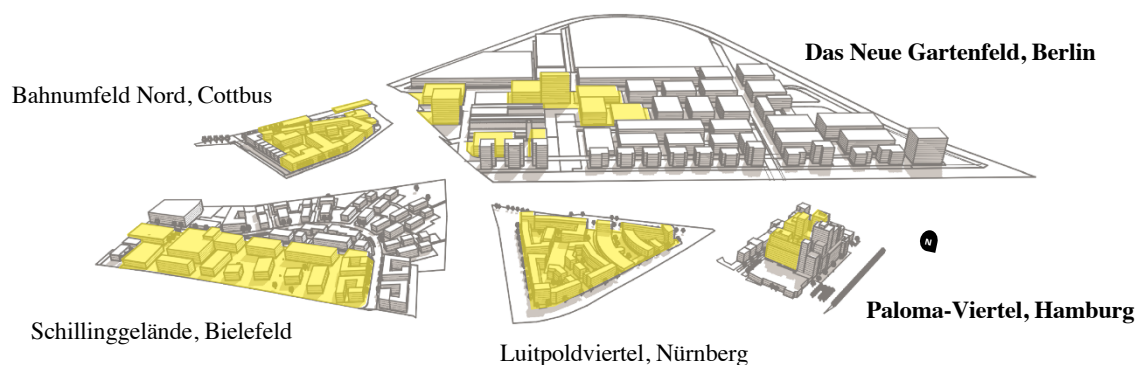
⁶ E.g. neighbourhood managers, users, investors, developers, owners, planners, authorities, city councils, citizens' advisory boards, cultural institutions, housing cooperatives, foundations, social entrepreneurs, interim use operators, building groups, design advisory boards and many more. Funding programs might also be among such actors, as they sometimes provide an impetus for development.

Thesis 7 / Dealing with uncertainty + ambivalence. The future can only be planned to a limited extent. The higher the complexity of the initial setting and the longer the intended life span, the more important it becomes to deal with uncertainty and incompleteness. The unknown is to be accepted as a given basis [30] and should rather serve as a catalyst for developments that are open to the future. [8,22,31]

4. Case studies. Scenario-based discussion of new urban zoning practice

In the research project, the theses of urban quality served as a benchmark for a qualitative evaluation of five current project developments in Germany with MU as case studies. The selection was made based on geographical distribution and to capture diverse intentions and proportions of space in the use of MU. The following table shows a size comparison of the approximate maximum building utilisation as well as the corresponding data and facts of two exemplary case studies.

Table 3. Case Studies. Sketch of the maximum utilisation possible under building law in size comparison, MU areas coloured yellow. Comparison of the type of development, size of the site, distribution of use, purpose of the MU and the measure of building use (example of two areas).



Das Neue Gartenfeld, Berlin. Conversion of a commercial and industrial area in a peripheral location while preserving listed buildings. Use of MU for increased variability of use of areas (previously planned as MI). 19 % GE, 18 % WA, 6 % MU, 5 % GEe, 3 % MK, 12 % existing water areas and harbour, 6 % areas for public use (campus, children, youth), 9 % public road traffic areas, 7 % public green areas, 5 % private green areas, 4 % private traffic areas for special purposes, 2 % public traffic areas for special purposes, 2 % rainwater retention basin (canal), 1 % private road traffic areas for special purposes. Area size 586,000 m². Building density in MU: GRZ = 0,5 to 0,8 / GFZ = 1,6 to 5,5 (in area with high-rise building up to 9,7).

Paloma Viertel, Hamburg. New development of a commercial area in the city centre on existing underground car parking garage. Use of MU for increased variability of use of areas (previously planned as MK) and realization of a high building density. 42 % MU, 34 % public traffic areas, 24 % MK, area size 6,000 m². Building density in MU: GRZ = 1,0 / GFZ = 5,0.

MU = urban zone; MK = central zone; MI = mixed-use zone; WA = common residential zone; GE = commercial zone; GEe = limited commercial zone

After analyses and interviews with actors involved, the research team developed local spatial scenarios based on fictitious implementation of the derived theses of urban quality. In subsequent scenario-based workshops with the actors, motivation, roles and qualities of MU were explored and spatial consequences were discussed – gaining valuable insight into the “first practice” of MU. The following figure gives an insight of the digitally-held scenario-based workshops. The scenario-based workshops first included a preparation assignment for the participation actors (please give an associative title for the urban situation, please describe the change / development between 2020 and 2040, please characterise the role of MU in the specific area in 2020 and 2040) and feedback on the theses of urban

quality. As part of the actual workshop, the answers were discussed as well as the scenarios developed by the research team. Potential use and alternative roles of MU with corresponding spatial qualities were the main results of the workshops for every case study.

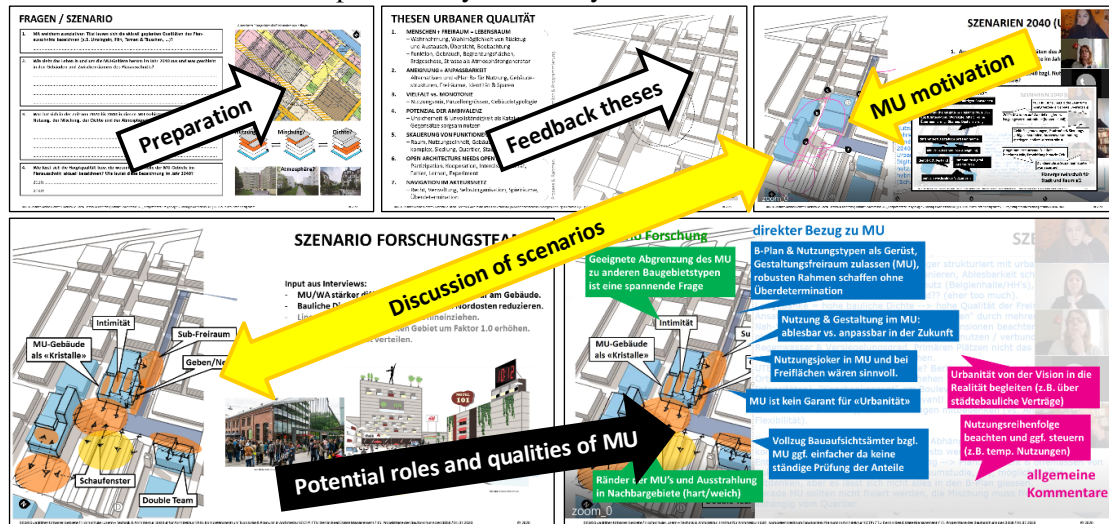


Figure 1. Case Studies. Elements of scenario-based workshops with stakeholders from *Das Neue Gartenfeld Berlin*. Top row: preparation assignment for stakeholders and feedback on theses of urban quality. Bottom row: collage from digital workshop session.

On one hand, the theses of urban quality and their relevance in the dialogue concerning qualities were verified during the case studies. On the other hand, the need was confirmed to discuss tangible qualities with various actors or stakeholders early on and to ensure implementation of defined goals.

Upon completion of the research project (confirmed by several interview partners) there were no legal rulings yet that could develop a significant influence on MU or determine specific use ratios in the future. The evaluated case studies were or will be realised after the completion of the research project. Therefore, the knowledge gained on constructional-spatial qualities of MU was limited to (partly binding or contractually secured) planning goals and procedures for negotiation and quality control.

5. Conclusion and toolbox

Due to the recent introduction of MU in 2017, development areas with MU are still mostly in the phase of urban land use planning. The evaluation of predicted qualities of yet to be realised buildings, open spaces and atmospheres indicated that design discussions are directly linked to the quality discourse of the actors – although an early definition of qualities rarely takes place.

While the effects of the introduction of the MU mainly concern quantitative planning law about the type and extent of building use, institutions, planners and the population need “tangible” visions in the sense of integrated urban development and the desired urban resilience. Illustrations of building and spaces can be very useful as carriers of visions and for negotiation. With their help, consequences and conflicting goals of this new structural, social density and mixed-use can be recognised earlier and negotiated in a more targeted manner. A mere labelling of quality goals is only helpful if there is a common understanding of the underlying (structural-spatial) characteristics.

During scenario-based workshops, the research team successfully used sketches of structural-spatial proposals to explore consequences of alternative design and additional application options for MU. It was found that an early discussion is useful, even without detailed architectural planning, when it defines key quality ideas. Examples include ground floor use programming, urban figure layout, height levels and the specific role of MU among other building zones in the development area. Such elements set the course for subsequent quality decisions and must be secured by means of suitable procedures. Since the decision for (or against) MU is made already in the urban land use planning phase, desired qualities

must also be defined by then. As structural-spatial aspects can have a direct influence on the mix of uses and the degree of mutability entails the question of future development, these decisions cannot be postponed or delegated to a later planning phase without obligation.

5.1. *Application potential of MU and process qualities*

The main findings from the evaluation of the case studies are summarised below. They cover the application potential of MU and the quality of process design as part of a holistic building culture and can be understood as an MU-specific supplement to strategic planning aids, framework conditions and higher-level goal formulations. The results can also be used in quality discussions on urban situations with other types of building areas that aim for increased density, mixed-use and adaptability.

Table 4. Potential application of MU and areas with increased density, mixed-use and adaptability.

MU offer a greater freedom of mixed-use than dedicated mixed-use or central zones. At the same time, the greater freedom implies a greater responsibility to incorporate mix and change into planning.
MU serve as a robust framework and precursor or catalyst for diverse uses and mixes in their urban design contexts. They allow sufficient design flexibility for future change by balancing structural-spatial design and future adaptability in favour of optimal resilience.
The increased building density of MU and the resulting density of use and occupancy increase the pressure of use and quality on adjacent free spaces.
Buildings and open spaces in the MU are hybrid spaces over time. The organisation and effect of the dynamics of change should be preserved in the long term in the operational phase
In the planning and implementation of MU, the area of impact and the effect on neighbouring areas must be considered. The use and structural-spatial design of interfaces and boundaries are of particular importance.
Urbanity is created through concentrated diversity and multi-coded uses. This is well possible with MU.
MU in itself is not a guarantee for urban quality. Not all conflicts of use can be solved with MU – be it within the same MU development area or towards neighbouring (different) development area types.

In addition to the use-related, building law freedoms and accompanying responsibilities, as well as the potential for diversity and spatial quality, other quality aspects for process design were identified.

Table 5. Process qualities for MU and areas with increased density, mixed-use and adaptability.

The desired urban quality is to be accompanied from vision to reality. This takes place via formal and informal instruments, whereby the desired structural-spatial qualities need to be fixed in a binding manner and must be secured until implementation.
Abstract qualities and scopes are to be agreed upon as consensus goals between the actors involved. This requires a fundamental quality discourse and concrete illustrations to develop a common position and a common understanding of terms.
Architectural-spatial qualities depend on ownership structures, investors, planners, architects and municipal requirements. They only emerge through dialog as part of a quality <i>Baukultur</i> .
Municipal quality requirements or those drawn up by project developers need not be an obstacle for market-oriented investors. Attractive, vibrant neighbourhoods serve urban life and are valued in the long term.
The planning and (especially) use sequence of a new neighbourhood set the standard for initial development. Sound planning can help to create a successful starting position. Managing can be achieved, for example, through temporary interim uses or "joker building areas" (if necessary, with MU).
In the built city, urban quality is also created by its users. If places are newly planned or rededicated, the challenge arises to "take along" the existing identity and transform it into a form of revitalisation and encounter.

A participatory “wish production” with the population manifests an active urban development that meets its residents at eye level. Through the knowledge of local “experts” relevant qualities can be incorporated into new programming. A suitably designed format ensures the “fun factor” for all actors during the years of planning.

5.2. Toolbox for a scenario-based quality discourse

To support the transition from an abstract discussion of values to a differentiated integrated quality discourse [2], a toolbox was proposed as supplementary product of the research project. It includes a workshop canvas⁷ and design elements in the form of typological proposals for structural-spatial situations and process-related elements to open the discussion between actors during early development phases of urban neighbourhoods with high density, mixed-use and changeability.

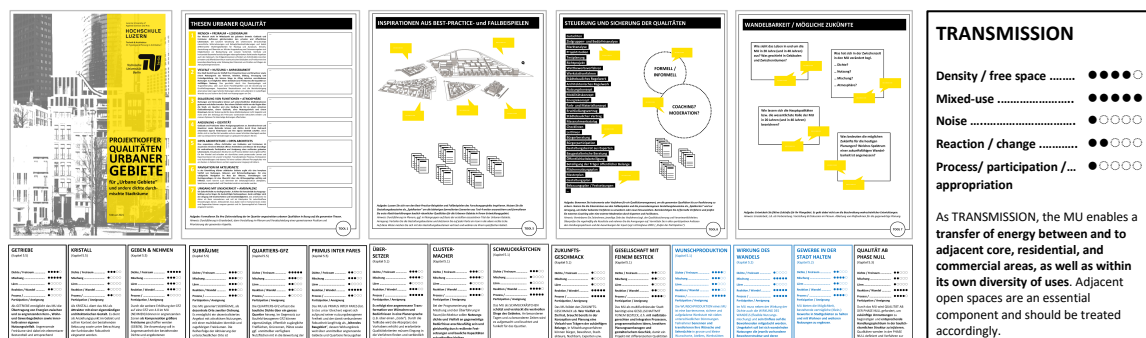
Table 6. Workshop Canvas and design elements as a toolbox for a scenario-based quality discourse of MU and other dense, mixed-use urban development projects with a high future transformability.

Workshop canvas “qualities of MU”. Eight tools in the form of posters for preparing, conducting and evaluating scenario workshops in order to negotiate, plan, implement and in the future adapt structurally-spatially qualities for MU. In this way, a playful (accompanying) quality discourse is established beyond technical-functional quantities. The tools include several tasks for application in a specific development area:

1. Formulation of objectives and discussion of theses of urban quality for a common understanding of the terms.
2. Creation of a mood board from pictures of successful urban situations with proposal for transfer.
3. Target group definition, (spatial) needs, local context and management of the mix.
4. Collection of associative titles as a variant starting point for scenario building.
5. Inspiration by mentioned best practice examples, case studies and after-mentioned design elements.
6. Sketches for localisation of qualities for buildings, urban figure, open space, interfaces to neighbouring areas.
7. Visionary descriptions of possible futures to capture changeability in the future.
8. Definition to control and secure the developed qualities from concept to operation.

Design elements for space and process with typological propositions for increasing constructional-spatial and process-related qualities when using MU. 60 playing card-like measures with descriptions serve as a tangible basis for discussion in the dialogue of the actors and for the negotiation of qualities in dense mixed-use urban areas and provide the opportunity for own additions. A scale gives an approximate potential of an influence on the aspects *density/free space, mixed-use, noise, reaction/change* and *process/participation/appropriation*.

Cover, instructions and poster templates of workshop canvas with playing-card-like design elements for space and progress (one element magnified) as parts of the toolbox for an integrated tangible planning process.



In principle, all stakeholders can moderate or conduct scenario workshops with the help of these tools. Contributions beyond a given role are encouraged to promote understanding and communication in an appreciative framework. It is not mandatory that all actors take every step together, but it is useful

⁷ A workshop canvas consists of poster templates with questions and action items based on which a workshop concept can be specified, implemented and evaluated.

to regularly share the state of development to check for feedback and include it in further discussions. To fully engage in the dialogue, it is recommended that workshops are conducted by external parties.

5.3. Outlook and further research potential

The presented results can be used by investors, developers, planners, authorities and other actors who are concerned with the realisation of “urban quality”, especially those who would like to use the novel building zone MU. This paper provides suitable methods and examples to create constructional-spatial and process qualities to include MU with versatile, future-oriented qualities into the urban fabric.

Due to the recent introduction of MU in the zoning ordinance, no built examples could be recorded and their effectively realised qualities in MU analysed. *This results in the research potential to evaluate the impact of the new type of building area category on the built habitat.* The developed toolbox concentrates the findings for a practice-oriented monitoring and quality discussion in the development of areas with MU. As a supplementary product, the toolbox could not be used or verified in the context of the given research project. *To test the effectiveness of the project suitcase, it would be interesting to use in a planning stage where the results are still open for discussion.*

References

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