The Architecture of Knowledge in Spatial Morphology

[DRAFT]

A. Architecture as a field of knowledge at ABE

A.1. The academic field of ABE

A.1.1. New demands on the academic field of ABE

The field of knowledge within the School of Architecture and the Built Environment (ABE) has in recent years received a central position in public debate. Not least is this due to the establishment of climate change as the most urgent issue on the world agendas, but many other urgent issues facing our societies today have also come to be directly connected with the built environment, for example economic growth and social segregation. This new and urgent demand for knowledge that can contribute to the development of long term sustainable forms for the cities of the world is a great challenge and opportunity for ABE. In the face of this new situation it is deeply problematic that the field does not lend itself easily to description and review. It could be argued that a reason for this simply is an immaturity in large parts of the field due exactly to previous lack of advanced knowledge demand, but also the fields “low tech” character compared to other schools at KTH. But there are two other reasons that probably are more productive to discuss.

First, the field of knowledge within ABE is to a high degree defined by its different professions, especially true when it comes to architecture and planning. This means that the training in application of knowledge through education often gets the overhand of the development of knowledge through research, which is opposite to the rule in the academic world. Professions are to their nature synthesizing in their day to day practice since what professionals do is to bring a wide spectrum of knowledge together in particular products or processes. To train students to be successful in this is always a central issue for all professional education and normally require close
rapport with neighbouring fields since it simply is not possible to harbour all necessary knowledge within a single university department. More problematic in a field where professionals play such a central role is to identify exactly what area of knowledge one has the need and responsibility to cover and develop in one’s own research. Without a clear idea on this there is always the risk of “amateur research” in areas that are handled with greater competence by other fields while knowledge specific to one’s own field is neglected. This does not only damage the own field, but disadvantage related fields where this knowledge could prove essential.

Second, the field of knowledge of ABE is difficult to describe because it has an unusual scientific and even epistemological range, where one can find all the great academic knowledge traditions from natural science over social science to the humanities. ABE therefore more or less is a university in itself. This is an aspect less consciously dealt with even in the different educational programs at the school, where the knowledge taught often is considered homogenous. In reality it is a combination of different forms of knowledge developed by different knowledge traditions with very different epistemological foundations, which therefore are not so easily synthesized. Once again, this is not a great problem for the educational programs offered at ABE, but in PhD-programs and research the issue is critical. Once again there is an obvious risk of amateurism when researchers enter knowledge traditions not trained in. There is also the risk of unproductive competition between knowledge traditions if one does not realise that one are not competing but studying the same thing from fundamentally different points of departure. What defines the different knowledge traditions is not the knowledge object in itself but the genuinely different questions they put to a knowledge object, that is, the nature of the knowledge one is looking for, this being the very reason they have developed so different theoretical and even epistemological points of departure as well as methodological approaches.

A.1.2. The urgent need of “theoretical description” of the academic field of ABE

What is needed against the background of the challenge ABE is facing is an analysis and mapping of its own field of knowledge as support for more efficient research in one’s field. It is important to stress that what is meant by this is not an inventory of current research but a theoretical analysis of its field, where the aim is to capture and describe the field’s theoretical potential – its field of possibility. Preconceptions given by the schools current research profile must rather be avoided since it is most likely that this is an arbitrary result of such things as funding opportunities.

It is here suggested that the procedure for this is to try to identify the core objects of knowledge in the field rather than delineate the field into its subordinated areas. The latter approach will inevitably lead to unproductive debates on where to draw the boundaries. This concurs with a common critique that there are no such boundaries since all areas of knowledge overlap their neighbouring areas, which is true, but that does not mean that such mappings are unnecessary or impossible. The point is that these overlaps are peripheries of different cores, which means that different areas of knowledge will look at these overlaps in different ways, the very reason why such overlaps can be so productive. The issue of knowledge cores therefore are essential for a deeper understanding of a field of knowledge, since they represent perspectives on the larger field defined by the constitution of the cores central knowledge object.
Concerning these central knowledge objects one more thing is important to stress as not to create misunderstandings on what is said here. Such knowledge objects can, as earlier stressed, be studied from the point of view of different knowledge traditions, why it is important to also identify the different kinds of research questions, on an epistemological level, that can be addressed to these knowledge objects. The “map” of the field of knowledge of ABE with its different cores is therefore, according to this model, likely to be constituted by knowledge objects and knowledge traditions.

Even though it might seem self-evident, it is also necessary to stress the fact that such an identification of knowledge cores in the field does not by necessity mean that they are accessible for research. There are two risks present here. On the one hand, there is the risk that one tries to do research on objects of knowledge, not realising that the theoretical and methodological development necessary for this is not yet there. What often happens then is that research becomes driven by methods rather than aims, that is, the research task will be transformed into what is suitable to the methodological techniques at hand while the original aims are deserted. For the very same reasons, there is on the other hand the risk that one does not discover potential areas of research since one does not have the techniques to approach it. Therefore, by making the development of new methodological techniques part of the research endeavour one can develop the knowledge one is looking for but sometimes also open new areas of knowledge for research. The critical issue of methodology must therefore be part of such a mapping of the field.

In any project of the kind discussed here it is understood that it can never give a total or final picture of the field, there will be fuzzy edges to the description and it will to some extent be prejudiced and biased by whoever does it. At the same time, by starting with the cores rather than the boundaries and thereby respecting the overlaps, it is here suggested that there at least is a possibility for a common view of the field, at least concerning these cores and maybe also parts of their internal relations. The issue here is furthermore not perfection or completeness but a pragmatic need for ABE to construct a reasonable picture of its own field of knowledge in an effort to plan and conduct efficient and successful research in the face of great new challenges.

**A.1.3. A tentative description of the academic field of the ABE**

Having said this, it seems reasonable to hint at some kind of structure to a map of the kind proposed above. The point of departure must be that what more or less all departments at ABE are concerned with is the built environment in its many dimensions; economical, social, technical, legal etc, where what distinguishes them from other disciplines is that they all in the end aim at a physical built reality shaped and structured by man. To this can be added that the built dimension of this physical reality to the most part is supportive to its real object, namely space, that is, the built dimension is structured, shaped and technically supported as to create efficient and convenient spaces for human action. Therefore it is not far-fetched to for a moment look upon ABE, not as the School of Architecture and the Built Environment, but as the School of Built Space. This is not saying that for example architecture or environment is not a valuable concept to ABE; what is discussed is not a change of name but a change of frame from which to think the academic endeavours of the school.
To think of ABE as the School of Built Space is of course to push things but such games can be revealing. First, built space does in itself identify a more approachable, albeit vast, academic object of knowledge than the scientifically vague architecture and the built environment, which in itself increases the potential for knowledge development. Second, it presents a common ground for researchers within ABE, not primarily by their recognition that this is what their own work is about but by presenting a knowledge object possible to relate their research to and in extension identify with. Where Architecture and the Built Environment is a “container-title” that you can put things into, Built Space is a “construction-title” that you can add things to. Third, for the very same reasons it creates a more comprehensible interface to other scientific disciplines. Fourth, it can give a better identity to the broader audience. Even though architecture and built environment can seem accessible concepts, the popular understanding of these concepts is often misleading to what actually is going on at ABE.

Establishing built space as the core object of knowledge of ABE is then a way of limiting the map we are looking for in relation to other fields of knowledge, not in any absolute sense, again there are fuzzy boundaries, but as a point of gravitation from which to start. As said earlier, it is not likely that all researchers at ABE would see built space as their field of research but it is likely that they would be able to relate their research to built space, and with greater scientific precision than the vague concepts of architecture and the built environment. Let us take a couple of examples: the field of Real Estate studies obviously relates to built space both when it concerns its planning and its economic dimensions, so the different sub-cores here probably concerns different legal and economic aspects of built space. Similarly the field of Transport studies inherently deals with built space but particularly movement in built space which will generate its own sub-cores. The same could be said about Civil and Architectural Engineering, while the sub-cores here deal with the technical construction of built space, etc. These are tentative proposals in fields better defined by people working in them, but in the following a more developed model concerning the academic field of architecture is presented on the same terms.

A.2. A model of description for the field of possibility in architectural theory

A.2.1. A new start for research at the Department of Architecture

The Department of Architecture (A) is responsible for a part of the larger academic field within ABE that is often regarded as a special case in this field since it carries many of the characteristics making ABE a scientifically vague field, only in a more extreme form. In this case the field of knowledge is to an even greater part defined by the profession and recognising the importance of the artistic dimension of the field one here probably can speak of an even greater range of knowledge engaged in its educational program. As a result the knowledge content is even more a mixture of different knowledge forms, why a likely conclusion is that if an analysis and description of the field of knowledge at ABE is difficult, it is almost impossible for A. There is reason to believe that this is a major reason why one for a long time have not seen it as possible or necessary to construct a long term organisation for research at the school, why we at present see a quantitative recession in research at the department.
Even though recent steps to construct such an organisation (Fig. 1) are most promising, especially since they are not only the result of top-down decisions from the leadership of the school but even more the result of a series of bottom-up reformulations of different areas of architectural research by younger researchers, it does lack a more stringent theoretical framework. Such a framework can prove essential for the sustainability of the new organisation, which otherwise runs several risks. One being a development of the different research areas into isolated islands with problems of communicating with each other since one does not see the common ground. Another risk is ending up in competition for research funding, where in reality is no competition since the different research areas cover, or should cover, different topics. In extension of this there is also the risk of lack of cooperation towards research sponsors since one believes one need to compete of what is there rather than cooperate in the development of the common field, where the amount of funding in this field actually has a great potential to grow.

Fig. 1. New academic structure at the Department of Architecture. Red indicates research areas.

For that reason, as well as to present an example relating to the discussion on similar needs at ABE as a whole, such a theoretical description of the academic field of A will be presented in the following. The principle followed will be to, first, identify core areas in the field with clear knowledge objects, second, show where they relate to the great academic knowledge traditions and, third, relate them both to earlier research areas at A as well as the new organisation and its aims.

A.2.2. A descriptive model for the field of knowledge of architecture

For a long time the discriminating concept for the field of knowledge at A has been *arkitektonisk gestaltning* (architectural formation), which typically defines its field of knowledge from the point of view of the profession. *Gestaltning* (formation) has therefore become the central concept in the department’s formulation of programs of internal development, discussions on the content of its educational program, as well as a signature in the recruitment of new staff members. From a professional point of
view the concept is very apt, since it captures both the synthesising character of architectural work at the same time as it stresses its artistic dimension. It is also easy to see how this concept does not belong to any other profession in society. An objection can be that the concept is very close to the more often used concept of design (design) that both carries more generality and has a richer theoretical base and therefore could be preferable.

In the following we will therefore use the concept design keeping in mind its close relation to the concept of formation. A central issue is what the counterpart of this concept would be for research in the field of knowledge at A, or put differently, how can the concept be translated from a synthesising concept to an analytical concept. The answer must be found in the question what it is that is designed in architecture, which soon leads to the answer that what is designed in architecture, is architectural form. We can then say that we in architectural form have found the central object of knowledge in the field of knowledge within A. From this we can proceed to the question of what fundamental research questions the different knowledge traditions can address to this object of knowledge and thereafter look for the methodologies and research techniques at hand, or necessary to develop, to answer these questions.

Without the ambition of either finality or totality, it can be useful to formulate a proposal, according to the sketch above, for a description of the field of knowledge at A. This presupposes a model that can both handle variations of the concept of architectural form and an epistemological framework of fundamental research questions within the field. What is proposed for such a model is a superposition of the Aristotelian model of the relation between form and matter (Aristoteles, Physics 1269a-1876b) and the Vitruvian conceptual model of architecture: firmitas, utilitas and venustas (Vitruvius, De Architectura III:3). The idea is that since the concept of form is so broad the Aristotelian model can be helpful in identifying sub-categories of form of relevance to the field of architecture. The Vitruvian model, on the other hand, contribute the fundamental knowledge questions of relevance to architectural research. Obviously we are here working with simplified and particular interpretations of both Aristoteles and Vitruvius concepts.

With such a model it is possible to generate a potential field of knowledge for architectural research (Fig. 2). But it also gives rise to intersections between the three Vitruvian concepts and different levels of form in built matter, which can be said to identify the core objects of knowledge in this field. Thus, we have created what we were looking for; a theoretically generated field of potential knowledge with identified core objects of knowledge. A short description of these cores can explain the model further. One thing might be necessary to say before entering this description. In any description of this kind quite broad concepts like technology, function and meaning will be used and talking about architecture these can be made to cover each other, that is, everything can be seen from each of these broad concepts. For example everything in architecture can be described as technologies: functional and expressive technologies for examples, or they can be described as functions, like technical and expressive functions. In the following description this will be avoided since it is bound to create confusion, but this does not imply an understanding where for example function only can be related to use of architecture or technology only to the constructive side of architecture.

The procedure will be as follows, we will specify the cores as general areas of research, then connect them to their particular research and methodological traditions
and finally relate them to both previous research at A as well as its new organisation and aims.

![Fig. 2. A descriptive model for the field of knowledge of architecture, or more specifically architectural theory, generated from the assumption that architectural form is its central object of knowledge.](image)

A.2.3. The core object of knowledge of architectural form as generic properties

First, there is the core object defined by *Firmitas, hållfasthet* (strength) in Swedish, which to a large degree deals with matter in the very direct meaning of building material but also building technology in close relation to the properties of such materials. This leads to a stress to a greater degree on matter and to a lesser on form. A possible definition of architectural form in this area of knowledge is therefore architectural form understood as *generic properties* in both building materials and building technology, which in architecture are intrinsically related to each other. It then follows that one concerning this core of knowledge predominantly has formulated research questions from the point of view of the research traditions of *engineering* and *the natural sciences* and furthermore has tried to answer these using the methodologies and research techniques developed in these traditions.

It is therefore quite clear how the kind of research earlier developed in the local departments at A of *Konstruktionslära* (Building Engineering) och *Husbyggnad* (Basic Building Design) belong to the study of this core. In an updated definition of this core object, where the concept of architectural form plays a more dynamic role, it can be more directly related to architectural design leading to an area of research more specific to the field of architecture. Previously this has been a problem in this area of architectural research since the research conducted often could have taken place at other departments at ABE. Such a new interpretation of this core is exactly the direction now taken under its new name *Arkitekturteknik* (Architectural Technologies), which promise cooperation with departments such as the Department of Civil and Architectural Engineering at ABE.
A.2.4. The core object of knowledge of architectural form as spatial structures

Second, there is the core object defined by *Utilitas*, or *användbarhet* (utility) in Swedish, which essentially deals with the spatial side of architectural form since what primarily is used in architecture is space, that is, we build buildings and cities out of physical materials as to create spaces and relations of spaces for human use. We are then dealing with architectural form of a more articulated kind than in the previous core, where what is addressed is how architectural form is structured to create spaces that fit different uses one is building for. A school is something different from a library, which again is different from a department store, and this is obviously reflected in the spatial structures created for the different purposes. If the earlier core dealt with architectural form as *generic properties* we can then say that we here are dealing with architectural form as *spatial structures*.

The type of research questions put to this object of knowledge primarily originates in the knowledge tradition of the social sciences, especially the side of this tradition inspired by the natural sciences but to some extent also the side inspired by the humanities, and in extension tries to answer these questions using the methodologies and research techniques developed in this tradition. The research question can for example be to what extent a school building creates or hinders social relation between students or teachers or to what degree the spatial structure of a certain building fits a particular use, for example a public library. There are obvious connections here to the research conducted at the division of *Bebyggelseanalys* (Built Environment Analysis), previously located at A, but also to previous research in *Stadsbyggnad* (Urban Design). New methodological as well as theoretical approaches to the analysis of spatial structure in relation to human use have under the last decade been introduced to this area of knowledge by the research group Spatial Analys och Design (Spatial Analysis and Design, SAD), which has led to more precise scientific results as well as a more dynamic relation to architectural and urban design. SAD is in the new organisation of A designated as the research side of Urban Design.

A.2.5. The core object of knowledge of architectural form as communicative signs

The third core of knowledge identified by the model above is *Venustas*, or *skönhet* (beauty) in Swedish, which is a rather problematic concept since it today is not so easy to speak of beauty in architecture or even an aesthetic side of architecture in a simple sense. Not because we are not interested in the aspects of architecture these concepts try to capture, but since they often lead to a very simplified discussion on the matter. A more productive approach is to speak about meaning in architecture, which leads to a discussion on a more general communicative dimension of architecture. If we from this point of view go back to our model and especially the Aristotelian concepts it is easy to see how we are now speaking about a very articulated level of form where matter plays a much lesser part. This area of knowledge deals with how architectural form can create meaning and in extension is communicative. Building materials and building technology as such are here of subordinate importance but can be used, and are often used, as communicative signs in an effort to create meaning. Also the structure and shape of space here plays a subordinate role but can likewise be applied in an architectural effort to create meaning.

It then seems suitable for this core of knowledge to speak of architectural form as *communicative signs*, as separate from the earlier embodiments of architectural
form, generic properties and spatial structures. It then also follows rather naturally that one here formulates research questions in architecture to the dominating part originating in the knowledge tradition of the humanities, that is an hermeneutical tradition, where one tries to interpret the meaning of an architectural object in a particular space-time context, sometimes also extending into the parts of the social sciences inspired by the humanities. It is here easy to see the relation to research in for example Arkitekturhistoria (Architectural History) but also Arkitekturteori (Architectural Theory). This fits very well with the recent development at A for both of these where the latter has developed into the research milieu Kritisk Arkitekturteori (Critical Studies in Architecture) located under the main department of Architecture.

A.2.6. The long term character of the model

The purposes of the model proposed above are several, first, to show that a description of the potential field of research in architecture is in principle possible, second, to show how productive it can be construct such a model from the point of departure of a central object of knowledge, third, to show how one by formulating fundamental research question to this object of knowledge from the point of view of the great knowledge traditions can generate sub-areas of accessible research within the field, fourth, how this underlines the need to find or develop the necessary methodologies or research techniques for such areas, fifth how such a description can create a framework for a new organisation of architectural research at a school of architecture.

Some further comments on the model are needed to avoid unnecessary misunderstandings. The aim of the model is to identify possible and maybe necessary areas of research at A on a fundamental level and in a long term perspective so that it can support a sustainable organisation and division into local departments at A. We then could see how it was fairly easy to sort the new local departments that are developing at A into the model. Architectural Technologies have strong ties to research on the firmitas core, Urban Design to the utilitas core and Architectural History to the venustas core, while the overarching department of Architecture through it sub-divisions could be found in all the cores. What the model then supports is a long-term structure of local departments at A that have the responsibility to be updated with the development within its own area of knowledge as well as develop knowledge in strategic parts of this area by themselves, thereby preserving and developing not only the expertise in their areas of knowledge but the research skill in the epistemological traditions the different areas represent. Finally, these departments have the responsibility to disseminate knowledge from within its own area of knowledge to students in the different educational programs.

These departments then have a long term responsibility that presupposes a sustaining and sustainable organization so that not essential parts of the academic field of A of long term importance for both architectural practice and society as a whole are lost due short term trends in funding or research aims. This does by no means mean that concrete research projects need to be kept within these departments. Rather, the majority of the actual research projects taking place at A will take the form of cooperation between these local departments or other departments at ABE, KTH or other universities. The point is that if such interdisciplinary projects are to be handled professionally and competently a prerequisite is that the different core areas
of knowledge are identified, kept alive and continuously developed, how could one otherwise offer anything to an interdisciplinary research project.

Neither does it imply that research of a more short term kind is not essential or productive. It is true that most research today needs to be interdisciplinary, at least this is the case for architectural research. But there is a risk in this, especially for rather small and undeveloped disciplines such as architecture, namely that the development of knowledge on the core areas are neglected. If this happens no productive interdisciplinary research can take place. As a matter of fact, this has been a major problem in architectural research up until recently, since architectural research easily lends itself to different interdisciplinary projects, while it is less recognised that architecture in itself presents a genuinely difficult field of research. One should therefore beware of research organisations structured around such specific and short term interdisciplinary research areas. An excellent form for such areas of research is either the type of research centres that are becoming increasingly common, at KTH as well as elsewhere or independent research groups.

A.3. A model of description for the field of possibility in design theory

A.3.1. KTH as a university of design

It is obvious that the model presented above is only a sketch and needs development and further description. At the same time it seems surprisingly apt in that it covers the field of knowledge in architecture in an unusually simple way, both by being comprehensive and by putting different research areas in architecture in a logical relation to each other. What it does not cover are research areas in architecture that aim not only at architectural form but architectural formation, that is, the development of knowledge on architecture as a process and not only a product. What is addressed here is the more general area of knowledge concerned with the design process. It is obvious that this is a critical area of knowledge of great importance to A, but it is important to remember that the design process as such is not unique for the academic field of architecture.

What was proposed above was a model that can be described as a model of the field of possibility for architectural theory, but the theoretical foundations for the design process in architecture is not found within this field of knowledge but in the more general field of design theory, but, as earlier stated, design theory is not something specific to A, rather it is an important foundation for many other fields of knowledge both at ABE and KTH as a whole. To apply design theory in architecture in a meaningful way one certainly need architectural theory but architectural theory is not a prerequisite for the study or application of design theory in general, it can just as well be concretised by theory and practice from other fields of knowledge. Therefore, design theory as a field of knowledge is a field of knowledge of general interest to all of ABE as well as KTH. The new Centre for Research and Design (CRD) located at ABE is therefore a great resource for A as well as other departments at ABE and KTH. On the other hand it is obvious how A also is a resource for CRD, especially since the field of architecture can present such an exceptional tradition in both design theory and design practice.

The introduction of the concept of design then should neither be regarded as a specific thing to A or as something dramatically new to KTH as a whole. As a university of technology what is a stake at KTH is never only the generation of new
knowledge through research or the \textit{dissemination} of knowledge in educational programs, but also the innovative \textit{application} of knowledge in new products and processes. Such application of knowledge is exactly what design is about. Thus, if we earlier ventured to say that ABE could be looked upon as the School of Built Space we can know be even more daring and say that KTH could be looked upon, not so much a university of technology, as a university of design.

\textbf{A.3.2. A descriptive model for the field of knowledge in architectural design}

Even though the field of architecture does not cover the field of design, it is still evident how the study of architecture as a process is a central object of knowledge falling within the domains of A. To see the full meaning of such an object of knowledge and its relation to other objects of knowledge in the field of architecture one need a similar model to the earlier one but now concerning the field of possibility in design theory rather than architectural theory. Earlier it was stated that design theory is not a field of knowledge singularly belonging to architecture, which is true, but it was also hinted that for design theory to become meaningful it needs to be embodied or concretised in a particular field of knowledge. There certainly is some epistemological or philosophical level of design theory where such an embodiment is not necessary, but as soon as design theory becomes concrete it has to draw from examples within other fields of knowledge. There simply can never be design in itself, there always needs to be design of something, design of architecture for example.

The model presented below then uses architecture as the example to embody the field of possibility in design theory, thereby keeping the Vitruvian conceptual triad but adding a theoretical model of the design process. The particular model of the design process proposed here is built on the generally agreed upon assumption that what is characteristic for design is the coming together of different epistemological knowledge forms, that is, design knowledge is not a knowledge in itself, like all practice it is the proficient use and interdependency of different forms of knowledge. What we need then is a description of the design process and more specifically the architectural design process.

Architectural design work is about giving shape and structure to architectural artefacts. Such processes comprise different phases. Most commonly recognised is the \textit{creative phase}, where the architect sketches possible solutions to an architectural problem. But just as important is the \textit{predictive phase}, where the architect tries to envisage the effects of the solutions; will it do the work. Such predictions can also be asked from a broader context, such as: how will my proposal be received in contemporary society. In the latter case the predictive phase is not only about \textit{prediction} but \textit{discernment} and can be called the \textit{discernment phase}. To the discernment phase also belongs the need to weigh together and decide on priorities among different predictions on the effects of architectural form, since these often will be in conflict. In real life these phases obviously are interlaced in a continuous process. The important thing is to realise, first, that all of these phases are in need of theoretical support and, second, that theory is of quite different kind and generated in quite different ways in the three different phases.

The bottom-line of the often mystified \textit{creative phase} is to know how to apply experience in new situations. That is not to deny the intuitive dimension of creativity. Rather intuition to a large extent seems to be exactly about that, the ability to let former experience subconsciously lead ones action. As in life in general then, more or
less any experience can be useful in architectural creation, but more specifically it obviously has to do with architectural experience. This can be of architectural artefacts as well as architectural ideas. A creative architect is able to translate these experiences to a set of possible perspectives or approaches, a repertoire, from which it is possible to select a productive approach in relation to a specific architectural problem at hand. Speaking from the point of view of theory in general this is a rather vague landscape of theory. Still in architecture it has a very long history and it can be argued that the majority of architectural theory falls into this category, which we here call generative theory.

It is maybe more obvious how the predictive phase need theoretical support. On what grounds can we predict the performance of architectural artefacts when it comes to things like construction, light and use for example. To a certain extent it is possible to once again go to experience of earlier cases. But characteristic of contemporary architectural work is the uniqueness of each architectural project, which makes it difficult to transfer experiences from one project to another. Instead one needs to turn to some principle, which, if it is to be successful, furthermore needs to be empirically supported. What is needed then is theory of a more familiar sort, that is, scientific theory of a traditional kind, which here will be called analytical theory.

Now, the predictive phase needs to be elaborated a bit, since it is often misunderstood as the direct application of analytical theory, a reason why it is usually not embraced among architects since such a procedure obviously runs the risk of falling into technocracy. Analytical theory concerns what is going on in general. In real life different needs will be in conflict with each other, so that general rules need to be translated to specific situations. This presupposes discernment in the architect, which research can support but never replace.

Fig. 2. A descriptive model for the field of knowledge of design, concretised as architectural design and generated from the assumption that epistemological knowledge forms is its central object of knowledge.

Discernment is also necessary when it comes to “predicting” an architectural project’s performance in a larger context, such as how it will be received in its cultural or social context, what above was called the discernment phase. Such questions can not be answered in the exact and often quantified way typical for analytical theory but needs
support of a different kind, that is, theory as it is developed in the humanities and the parts of the social sciences inspired by the humanities. Such theory will here be called critical theory.

We then more specifically can see the different types of knowledge at work in the process of architectural design. In the creative phase we see the need for something we can call generative knowledge, in the predictive phase something we can call analytical knowledge and in the discernment phase something we can call critical knowledge. It is of course important to remember that these kinds of knowledge interact in different ways and sometimes one kind of knowledge can be put into use in the form of another. For example, critical theory is often supported by analytical theory, just as analytical theory can be put into context by critical theory, while both analytical and critical theory can work as generative theory.

A.3.3. The epistemological origin for the forms of knowledge in the design process

Now, there are two results of this model concerning the academic field of architecture, one concerns knowledge on architecture as process, the other reflects back to our earlier analysis of knowledge on architecture as product. The first is supported by the model in that it makes clear the central elements of knowledge at work in the design process, both generally speaking as well as more specifically concerning architecture. If one is aiming at new knowledge on the design process all of these elements need to be part of such a study. Attempts at establishing an area of knowledge for research concerning architecture as process have already been conducted at A and can be found under the area of knowledge called Design Processes in the new academic structure at A.

The second is that it expands the field of possibility for the previous areas of knowledge identified in the earlier model. For example, where we earlier identified an area of knowledge concerned with architectural form as generative properties, we can now also ask if such research can give rise to a generative, analytical or critical theory or maybe all of them. It is then quite clear how these kinds of theory have rather clear origins in different knowledge traditions.

Analytical theory is clearly what we find in engineering and the natural sciences as well as the parts of the social sciences that are inspired by these knowledge traditions. This means that, at least traditionally, the area of knowledge concerned with architectural form as generic properties in building material and building technology, primarily will produce analytical theory. Similarly, the area of knowledge concerned with architectural form as spatial structures will also produce analytical theory as long it keeps within the part of the social sciences inspired by the natural sciences.

Critical theory, on the other hand, has strong ties to the humanities and the parts of the social sciences that are inspired by the humanities, which means that the area of knowledge concerned with architectural form as communicative signs is likely to primarily produce critical theory and so will the area concerned with spatial structures if it expands it range into the parts of the social sciences inspired by the humanities.

Generative theory, finally, does not fit into these knowledge traditions but rather have its roots in theory as it is understood in art, where the idea of theory is concerned with how things could be rather than how they actually are, the domain of traditional scientific endeavour.
Generative theory being less acknowledged in academia needs some further elaboration, especially since it is a crucial element in the design process and since the field of architecture is extremely rich in such theory and that, furthermore, in two ways. First, most theoretical production in architecture, from Vitruvius to Le Corbusier, falls into this category. Even though it can be disguised as both analytical and critical theory, it most of the time is extremely weak as such theory. The aim of its authors is another, namely to expand the field of possibility in architecture, most of the time with a normative aim – these new possibilities are the ones that should be chosen – but it does not need to be read like that. Rather, such theory serves as inspiration, helping architects to broaden their own experience and repertoire with new possibilities in architecture, thereby finding new possible ways of solving the problem they are working with. Second, the generation of architectural projects and designs are in themselves carriers of generative theory. Realised or not, such projects do the same thing as the architectural theories referred to above, namely presents new possibilities in architecture that help architects to expand their own experience and repertoire. This is the obvious reason the study of real cases has always played such a central role in architectural education.

Apart from the earlier conclusion that both most analytical and critical theory can serve as generative theory, the rather surprising conclusion here is that concerning generative theory it is clear how architectural history can play a critical part, since it is the area of knowledge that records the history of both architectural theory and architectural projects. With some afterthought, this is not so surprising since it is exactly in this way we can learn from history. History does not produce analytical knowledge from which we can predict what will happen, history is the prime science in collecting human experience, thus, history can help us expand our personal experience, as humans in general but also as professional architects.

Apart from this there is also the possibility to develop generative theory more consciously for example in experimental projects or student work. This is exactly what has been going on at A in different forms and this kind of work has in the new academic structure at A been given a more stringent form sorting under Design Processes.

A.3.4. The role of generative theory at KTH

Some further comments concerning the more unusual form of knowledge discussed here, generative knowledge, are necessary. From the above it is clear how generative theory is an extremely important aspect of design theory in general as well as for successful design and how the field of architecture can present a tradition of such theory without comparison in any other design field. Architecture here therefore has an extremely important role to play concerning the development of design theory at KTH. As a matter of fact, if we do what we proposed a while ago and look upon KTH as a university of design for a while, we can see how it is exactly in this aspect of design that KTH is generally weak. Concerning analytical theory and thereby the predictive phase of design, KTH has a most solid base to stand on in the many fields of knowledge the university comprises. Likewise one has many schools and departments that in recent years have expanded its knowledge and awareness when it comes to critical theory and thereby what we have called the discernment phase in the design process. But when it comes to generative theory KTH is generally speaking weak. The prime exception to the rule is the Department of Architecture, where
exactly this aspect and phase of the design process has been consciously studied and even theorised for a long time.

On the other hand, if A has an exceptional record when it comes to generative knowledge, and like the rest of KTH in recent years has expanded its knowledge and awareness concerning critical theory, one is still weak when it comes to analytical theory. This is deeply problematic for the field of knowledge of architecture and especially its practice and that for two reasons. First, it is problematic because it leaves practicing architects without powerful tools to predict the effects of their work. The perpetual criticism of architectural work during the 20th century where the credibility for Swedish architects sunk to an all time low in the seventies, can be seen as an effect of this. Second, even though one have generated both an interest and growing awareness of the importance of critical theory and thereby setting architectural work in a larger social and cultural context, leaving the technocratic tendencies of the fifties and sixties, such theory can be difficult to tie to individual architectural projects without the support of analytical theory.

The model presented above then seems most generative in a series of aspects, relating architectural theory to the more general design process, identifying exactly where and what kind of architectural theory can be useful in the design process, but also relating architecture to other disciplines at KTH where design is central, revealing an interdependency between A and KTH in general.

A.4. Conclusions

What has been attempted here is to answer to the apparent need to strengthen the principal understanding of the field of knowledge of ABE in the face of an urgent world wide need of new knowledge that puts ABE in the forefront of the schools of KTH. This has furthermore been attempted through a theoretical description of the field of knowledge of A as a department of ABE with the idea that such a description, besides giving rise to such a description for A, something lacking for a very long time, also can serve as an example for other departments of ABE.

The attempt has been carried through starting with the idea that large fields of knowledge, such as the one found at ABE, are constituted by a series of cores with central knowledge objects that gives rise to areas of knowledge. These areas of knowledge partly often overlap with other knowledge areas why a distinct description of the field of ABE would be difficult to agree upon, but the knowledge cores in themselves and their interrelations could maybe be easier to agree upon. A central knowledge object for ABE was also proposed in Built Space, to which all the other cores could be related, for example as the economy of built space, the construction of built space and the design of built space.

The idea was then worked out in some detail concerning the field of knowledge of architecture, where, first of all, architectural form was identified as the core object of knowledge, relating to the more general object of knowledge for ABE as a whole, built space, as the material with which built space is shaped and structured. Then, by adding fundamental research questions on an epistemological level to this core object of knowledge, three sub-cores were able to be identified tentatively called architectural form as generic properties, architectural form as spatial structures, and architectural form as communicative signs. These three proved to be possible to relate to both earlier and new organisational models at the school of architecture but adding an internal logic to them.
Finally this description was broadened to also encompass the generative process of architectural form by relating this to the more generally applicable design model, where it was argued that what is characteristic to the design process is the coming together of not only knowledge from different knowledge areas but knowledge of different kinds on a deep epistemological level. This deepened the understanding of different types of architectural theory and their role in the architectural design process, but also emphasised the need to study the architectural design process as such.

In the end it was also argued that the design process could work as general framework for many other departments at both ABE and even KTH as a whole, since what characterises KTH and other technological universities, at least historically, is its stress on, at the side of development and dissemination of knowledge, application of knowledge, which actually can fruitfully be described as a design process and that in such a reinvigorating redefinition ABE could take a leading role.
B. Spatial Morphology as a field of research

A.4. Spatial Morphology as a field of knowledge at A and ABE

A.4.1. A specific field of knowledge called Spatial Morphology

The model of description for the field of knowledge at A presented above had the general aim of showing that it is possible to describe this field in a logical and coherent way but it also had the more specific aim of identifying a particular area of architectural research here proposed to be given the name of Spatial Morphology (SM). This specific aim actually is the central aim of this document as a whole and from hereon it will specifically deal with the internal architecture of this field of knowledge.

First, the fields will be described as a field of architecture, that is, its relation to other fields of knowledge at A and especially its new organisation will be discussed. Second, the field will be given an introductory description as a field of knowledge, that is, its general character including its core object of knowledge, fundamental research questions, epistemological origin and primary research methods will be introduced. Third, the field will be described as a field of research, that is, how its knowledge can be developed. Fourth, the field will be described as a field of education, that is, how its knowledge can be disseminated. Fifth, the field will be described as a field of practice, that is, how its knowledge can be applied.

The particular area of architectural knowledge we are concerned with is the one the model above identified in the intersection between the Vitruvian concept of utilitas and the understanding of form as spatial structure in the Aristotelian model. It is here proposed that the name of this area of knowledge is Spatial Morphology (Spatial morfologi). This area of knowledge was related to new research taking place under the local department of Urban Design, but this connection is not immediately obvious and need some further discussion.

A.4.2. The core object of knowledge in Urban Design at A

Urban design does not immediately fit into the model of architectural knowledge presented above. Partly this is so because we think of urban design as dealing with another scale than what we associate with architecture; we normally associate architecture with the design of buildings rather than the design of cities. Partly this is so because the field has strong ties to Urban and Spatial Planning (Samhällsplanering), both as a field of knowledge and institutionally in a way that architecture does not. Once again, it can be possible to more specifically understand what we mean by urban design at a school of architecture by trying to define its central object of knowledge.

If the central concept at A as a whole is architectural design it is easy to see how urban design is closely related to this and that the Swedish word stadsgröngdning more or less is a translation of the English concept. It then seems natural to see urban form (stadsform), in parallel to architectural form, as the central object of knowledge in the field. Thus, one can say that the field of knowledge of stadsbyggnad, as it is specifically studied and taught at A, is urban design and that its central object of knowledge is urban form (stadsform).
The point here is that this makes it possible to talk about stadsbyggnad also at other departments of ABE, but that the central object of knowledge then is a different one. An example of another central object of knowledge pertaining to stadsbyggnad is the specific and legally manifested planning process in Sweden that urban design is part of. This can then be an object of study within departments where this process is central. Another example could be the parts of stadsbyggnad that to a higher degree has the character of urban planning than urban design and therefore rather can be part of the department of Spatial Planning (SP) than A. One can also see the theories of stadsbyggnad as a specific object of knowledge that constitutes a compartment within the much larger field of urban theory in general, which, once again, does not necessarily belong to A.

Still, stadsbyggnad has traditionally been closely related to the design of cities and has therefore had strong ties to A. There is therefore reason for the field to keep this association but through a discussion on its central object of knowledge present a stronger definition of its specific interpretation at A both to support the own identity and thereby its specific needs for example when it comes to research, but also as a means to open up the field for studies also by other departments at ABE. Given that the core object of knowledge in stadsbyggnad at A is urban form we see the close relation to architectural form and the conclusion that stadsbyggnad at A is interpreted as the architectural design of cities, seems quite close at hand. This should not be interpreted simply as cities as an agglomeration of architecturally designed buildings but rather as a city or large parts of a city as whole as an architectural composition. This conclusion can be made credible simply by looking at the different cities we have, where it is easy to differentiate between the ones that to the larger part have been growing spontaneously, like London, from the ones that have been planned like New York to the ones that have been architecturally designed, like Brasilia. Normally cities are not of one kind though but combine different origins, but the same distinctions can still be made. In Stockholm for example, it is easy to differentiate between the parts that have grown spontaneously, like Gamla Stan, from the ones that have been planned, like the grids on malmarna, and those who have been architecturally designed, like Röda Bergen. At A stadsbyggnad then can be said to add an architectural approach or perspective to cities.

**A.4.3. The relation between Spatial Morphology and Urban Design**

This discussion can help us better understand the relation of urban design to the rest of A and also its particularities when it comes to architectural research. Having earlier defined the central knowledge object in urban design at A as urban form we could then substitute architectural form in the vitruvio-aristotelian model above for urban form and immediately double the amount of research areas in the field of architecture. This would be problematic for many reasons but one would simply be that the field already is very large and it would be unrealistic to generate professional research in all these areas. But if we look a little closer at this it will become obvious how such a doubling is unnecessary and even illogical.

What we are trying to capture with the model above is the potential field of architectural research and in research one is by necessity always studying specific aspects of a field, in the field of architecture for example its construction, use or history. One can simply never make a scientific study of architecture in all its dimensions. What researchers are good at then is the study of a certain aspect of
architecture, for example its technical aspect, and this is so because the study of such aspects have their roots in different knowledge and research traditions with very specific theoretical foundations and research methods. It is therefore difficult for an individual researcher to bridge and master more than his or her specific field and this is why we in such cases rather see collaboration between researchers from different fields. In architecture with its broad knowledge base this will often be necessary also within its own field – there is simply no such thing as a researcher of architecture in general. This means that for a researcher the step from the particular aspect he or she studies to another aspect is a great one, while the step from a particular type of architectural object to another is not so great. That is to say that it is easier for an architectural researcher to go from the study of building use to city use or building history to city history than to go from building use to building history.

In architectural practice it is the other way around. It is in an architectural project simply not possible to leave some aspects of architecture out, for example its construction or use. In architectural practice one strives for a synthesis of all these aspects. With the risk of simplifying things, the architect is a synthesiser and generalist striving for a complete architectural composition, while the architectural researcher is an analyst and specialist striving for deep knowledge of an architectural aspect. At bottom this is quite obvious but it can be rather confusing especially when it comes to the organisation of university departments. Of the four local departments proposed in the new organisation of A, it now is becoming obvious how two of them are defined from the point of view of architectural practice, Architecture and Urban Design, and two from the point of view of architectural research, Architectural Technologies and Architectural History. From the point of view of research it then is quite clear what is studied in the latter two but not so concerning the first two. In Architecture we find subcategories where some are clearly defined from the point of view of research, but what is the research side of Urban Design.

It is here proposed that this is the field of Spatial Morphology, since urban form due to the fact that it normally is of a larger scale than architectural form is naturally embodied on a structural level. Naturally we can speak of spatial structures and thereby spatial morphology also in architecture but given the present organisation the base for Spatial Morphology in Urban Design seems reasonable. When we speak about urban form as communicative signs we are often referring to individual buildings or smaller groups of buildings and this is therefore more logical to designate to the local department of Architecture and more specifically the research group Critical Studies in Architecture. When we speak of urban form as generative properties, on the other hand, we rather end up in the kind of research taking place at Highway, Water and Civil Engineering at ABE or Architectural Technologies at A. The point here is simply that concerning some of the research questions possible to direct at urban form, there are already accomplished research milieus for which the step would not be far to extend their activities also to studies on urban form, while there are not such milieus or departments dedicated to the study of spatial structures, be it on the level of architectural or urban form. Furthermore, urban design has a natural connection to research with a close relation to the social sciences and the social use of the city since the city often is understood as the physical embodiment of society. On the other hand, it is often when we speak about the social use of buildings that we start using the city as a metaphor for buildings, once again hinting of a rather natural connection between Urban Design and what is here called Spatial Morphology. Still, just as the study of for example communicative signs in the research group Critical Studies in Architecture does not need to limit its studies to
architectural form but for good reasons should extend their studies to include urban
form, the study of spatial structures at the local department of Urban Design should
not limit its studies to urban form but also include architectural form.

B.1. Description of Spatial Morphology as a field of research

B.1.1. Summary

Spatial Morphology as an academic field aims at the development of knowledge and
theory that can support architectural design work, both on the scale of buildings and
the scale of cities. Design work needs theoretical support both in its generative phase,
when possible solutions to an architectural problem are formulated, its predictive
phase, when the performance of such solutions are evaluated, and in its assessment
phase, when such solutions are interpreted in relation to a larger cultural and social
context. Research in Spatial Morphology especially aims at the development of
analytical theory, keeping in mind that such theory also can be used as generative
theory and can support critical theory.

More specifically Spatial Morphology aims at the development of such know-
ledge and theory from the point of view of social performativity, that is, how spatial
systems influence social interactions and processes. On the scale of the city this can
cconcern how the structure of urban form integrates or segregates different social
groups or how urban form create good or bad locations for different land-uses. On the
scale of buildings this can concern how office-buildings influence office-work by
setting fundamental spatial relations that either support or hinder the work of an office
organisation. Since the social performativity of architecture is such a fundamental
aspect of architecture in general, such knowledge and theory can also contribute to
other areas of architectural theory such as theories on meaning in architecture.

What is essential to the social performativity of architecture is architectural
space since space is what people use. What gives structure and shape to architectural
space is built form why Spatial Morphology is strongly related to architectural and
urban morphology in general. This makes methods and techniques for the description
and analysis of architectural space and form essential to Spatial Morphology. Such
methods and techniques are not as common in architectural research as one would
think, why Spatial Morphology specifically aims at the development of such
analytical tools.

In summary, Spatial Morphology aims to contribute to the development of pre-
dictive knowledge and architectural theory on the social performativity of architec-
tural artefacts through the analysis of architectural space and form, where such know-
ledge and theory both can support the generation of architecture and urban design as
well as support architecture and urban design to reach its aims. More generally Spatial
Morphology aims at the development of architectural knowledge and theory that is
able, not only to deepen our understanding and critique of architecture, but to deepen
our understanding and critique of society.

B.1.2. Spatial morphology in the field of architectural research

Since contemporary architectural design work to such a high degree deal with unique
and complex situations in almost every project, it is difficult to draw from earlier
experience. This fact implies the step for architectural practice from an *experience based craft* to a *theory based profession* – architects can no longer argue from the point of earlier examples but must argue from the point of principles. Thus, architecture has become an inherently theoretical field of knowledge. This is the reason why contemporary architects need support from research and research along a broad epistemological spectrum. There seems to be two primary sources for such architectural research, *architectural ideas* and *architectural artefacts*. Most architectural research deals with both sources but address them with different methodological approaches in relation to what type of knowledge one is looking for.

To a certain degree one can say that the primary source in the generation of analytical knowledge is architectural artefacts, while the primary source in the generation of critical knowledge is architectural ideas. Certainly, architectural ideas are present in architectural artefacts just as well as architectural artefacts are present in architectural ideas. What is essential for predictive knowledge though, is knowledge on specific architectural properties that are possible to tie to specific architectural performances, which tend to make architectural artefacts the primary object of study. What is essential to critical knowledge on the other hand, is knowledge on the context behind the creation or reception of architecture, which tend to make architectural ideas as the primary object of study. In Spatial Morphology architectural artefacts are the primary objects of study.

**B.1.3. Analysis of architectural artefacts**

While the methods and techniques for the analysis of ideas, architectural or other, are quite developed, albeit often debated, the methods and techniques for the analysis of artefacts, architectural or other, are not as developed. This forces any endeavour of architectural research along the lines of artefact analysis to develop analytical tools and techniques. What is at hand is the for all research necessary task to develop tools whereby one can describe ones knowledge object in a productive way. In research phenomena are not just there by themselves, ready to be studied, but need to be generated. In extreme cases we need to build huge laboratories for such generation, such as CERN. In other cases it is just a matter of developing tools that make it possible to see what earlier was not visible, like the telescope and microscope managed to do.

Similar descriptive and analytical tools and techniques are just as necessary in architectural research, but its development has to a large degree been neglected. Two things are necessary for the development of such techniques. First, one needs a clear idea about the nature of the knowledge object one is about to analyse. That is not to say that one aims at defining the true essence of the knowledge object, but that one formulates a productive understanding of it for the kind of analysis one is aiming at. Second, this presumes a clear idea of from what perspective or to what purpose or end one wants to analyse the knowledge object. In the academic field of Spatial Morphology this perspective is the *social performativity* of architecture, which precisely leads to an understanding of its knowledge object as architectural space as structured and shaped by architectural form.
B.1.4. Methodological approach

Methodologically Spatial Morphology is rooted in the social sciences, especially the parts inspired by the natural sciences, that is to say that it primarily work in the field of statistical analysis. More specifically it concerns correlational research, that is, search for relational patterns between different type of phenomena, primarily relations between spatial and social phenomena. Statistical and quantitative description of social phenomena has a long tradition in the social sciences while similar descriptions in architectural research and its spatial phenomena are not very developed. This is the reason for the central concern of descriptive development in the field. How do we build informative models of architectural and urban form in relation to use and similarly how do we quantify architectural and urban form so that we in a fruitful way can correlate it with different aspects of its social performativity. This also puts Spatial Morphology in the methodological tradition of modelling and simulation.

B.1.5. The relation between physical form and spatial structure

As stated earlier architectural design is about giving shape and structure to architectural artefacts, that is to say that architectural design is about architectural form. Absolutely crucial here is the interplay between built form and spatial structure, where built form is a prerequisite for the structure of space just as space is a prerequisite for the articulation of built form. We need analytical tools both for built form and spatial structure that can generate productive descriptions of architectural form for research, that is, the development of an analytical architectural morphology.

As discussed in part A, depending on our scientific perspective or purpose, such a morphology will be of very different kinds. If our approach is hermeneutical the morphological descriptions will tend towards descriptions of architectural form as signs and even language, while in an analytical approach they will tend towards descriptions of architectural form as geometry and even mathematics. Research in Spatial Morphology is clearly based on geometric descriptions.

B.1.6. The relation between geographical space and architectural space

A geometric morphology of architecture can take any direction if there is not a clear idea of the scientific purpose of it. To start with it is clear that architectural form only presents a sub-set of what is geometrically possible. There are two limiting forces at work here. On the one hand the limitations set by the materials that constitute the physical form of an architectural artefact. On the other the limitations set by human use on the spatial structure of an architectural artefact. While the limitations set by the constructive properties of physical materials is rather well known, the limitations set by the “social properties” of space as an architectural “material” is far less known.

When it comes to architectural use in the social sense of the word, that is how architectural artefacts influence social interactions and processes, it is exactly space that is addressed. This means that what is limiting to the geometrically possible when it comes to architectural space is what is spatially relevant to social use of architecture. Spatial Morphology therefore needs to contribute to an architectural morphology that describes and analyses the form and structure of architectural space from the point of view of social use.
When talking about space here it is important to remember that the dominating field of knowledge when it comes to space is Geography. The relation between architectural space and geographical space is therefore of fundamental importance to the definition of spatial morphology at a school of architecture. This is especially so since one fundamental difference between urban and spatial planning on the one hand and architecture and urban design on the other, is that the first relies primarily on a geographical understanding of space and the latter on an architectural understanding. The differences here are many even though the two often also overlap. First of all, the geographical tradition is fundamentally descriptive in its nature while the architectural is generative, that is, while the first primarily aims at describing how things are and therefore can be said to be concerned with the production of maps, the second primarily aims at creating new situations and is therefore concerned with the production of projects.

Going further, it is possible to say that due to the different scales that is normally dealt with in the geographical and the architectural tradition respectively, there is a bias, using the concepts of Henri Lefebvre, towards conceived space in geography and towards perceived space in architecture, that is, space in geography is often handled without the idea of an experiencing subject, while this is often the very starting point in architectural space. In extension this also often leads to an understanding of space in urban and spatial planning as neutral background where different land-uses are located in space but where space in itself has no shape or structure. Architectural space on the other hand is very concerned with the very shaping and structuring of space in itself. In a simplified way one can therefore speak of a functionalist approach to space in urban and spatial planning and a formalist approach to space in architecture and urban design.

**B.1.7. From firmitas to performativity**

The perspective of social use of architecture is a classic theme in architectural theory and history. We can delineate it back to Vitruvius division of architecture into firmitas, utilitas and venustas, where it clearly belongs to utilitas. Utilitas has been given different status and interpretations through history. In the 20th century it held a prime position within architectural discourse, interpreted through the concept of function. Today the concept of function has become both ideologically and epistemologically problematic, especially when set up as a relation between form and function. Both the definitions of form and function respectively, as they were put forward in architectural discourse during the 20th century, seem to lack a key to how the two concepts actually are related. This is also the reason why scientific knowledge on the subject has proven so difficult to develop. Architectural practice in this regard has also proven most unsuccessful, which in extension has made the discourse on function ideologically difficult.

Therefore it can be productive with a new interpretation of utilitas, substituting the concept of function with the concept of performativity. This concept carries an understanding of architecture, and more specifically architectural space, as not just a background or platform for social processes, but instead as a social material in itself. The other way around it presents the possibility to analyse and understand social processes as inherently spatial. The more specific understanding of architectural space that opens for such a close tie to the social is an understanding of architectural space as a system or a configuration. Since it is quite easy to understand social entities as
systems or configurations, a configurational perspective seems able to tie the spatial to the social in a productive way. Spatial Morphology therefore has a system approach to the analysis of space, rather than for example a typological or genealogical approach.

**B.1.8. The potential of the academic field of Spatial Morphology**

The general aim of Spatial Morphology is to through research on the relation between architectural design and architectural performativity formulate architectural theory, primarily of an analytical kind, but as has been argued, as an offspring of this there is also the possibility of both critical and generative theory. Similarly, the prime aim of this research is to support architectural practice, but there is also an obvious potential to contribute to other academic fields where space plays an important role and finally to through new knowledge contribute to the development of contemporary society, where the issue of space has been increasingly addressed in recent decades. Sorted in another way it carries the potential to develop a most promising field of research and thereby development of new knowledge, contribute to new fields of education through the dissemination of knowledge and enhance fields of practice through the application of its knowledge.

This taken together creates a huge potential for the academic field of Spatial Morphology at KTH. It should be stressed that Spatial Morphology in this way presents itself as a rare thing in the academic world. It is not a field centred round a new topic that is in urgent need of knowledge development due to new demands from society, however important and fruitful that can be. It is the discovery of a huge and so far undeveloped academic field that bear promise of great potential of development that can prove to be of importance in innumeral such knowledge demands, now and in the future. It is important to remind ourselves what the central knowledge object is here, namely the manmade spatial settings that create the reality for our everyday life. The world is not so much given to us by nature anymore as created by ourselves, where the field of Spatial Morphology aims at the study of the knowledge foundations for these creations. In this we can see the ultimate goal of Spatial Morphology, which is to develop architectural theory that can deepen our understanding and sharpen our critique of contemporary society and culture. The original thing here is that, instead of using social and cultural theory to understand and criticise architecture, Spatial Morphology uses architectural theory to understand and criticise society.

**B.1.9. A research strategy for Spatial Morphology**

Apart from a well-founded understanding of its field of knowledge all research need a strategy for how this field is to be developed. Of prime importance here are research programs that open distinct sub-areas of the field for research. Within these programs, that create a scientific framework, including its methodological approach, different concrete research projects can be developed. The general idea is to develop a structure where long-term research, which is needed to develop knowledge of true relevance, can take place in the form of smaller short-term projects, which often is the everyday reality for researchers. To illustrate the meaning of program and project respectively an example currently under hand at A is presented below. It comprises so far four such short-term projects summarised in a fifth short term project. While the
over all aim of the program, described in its title “Urban form and sustainable
development”, is quite ambitious and impossible to keep within the limits of a single
short-term project, it can work as the framework for several such projects. In this case
it has done so for four projects, where the project names are quite revealing about
their position in the overall program: “Urban form and social sustainability”, “Urban
form and economic sustainability”, “Urban form and environmental sustainability”
and finally “Urban form and analytical tools”. The fifth project concerns a theoretical
summary of all the projects, where the title of the project again is telling about its role
in the general program: “Spatial capital – an analytical theory on urban form and
sustainable development”.

Three comments can be important. First, it is obvious how this is an ambitious
program that could comprise many further projects than the ones named here.
Actually, each of the first four projects could be programs in themselves comprising
sub-projects. This rather proves the strength of the strategy. On the one hand, one can
do a summary of the field comprising a limited set of projects, on the other hand, the
program can live on also after such a summary and generate new projects and
summaries. Second, the project “Urban form and analytical tools”, stresses the
importance of development of methodology and research techniques, especially in
new fields of knowledge. Third, the theoretical summaries can either concern
different areas of the programme, in this case for example, an analytical theory on
urban form and social sustainability, or a theoretical summary for the programme as a
whole. In either case it is obvious how new research projects within the program can
contribute to further development of these theoretical summaries. Taken together the
strategy presents a way of dealing with the situation typical for research where high
ambitions and uncertain funding often are in conflict.

B.1.10. Research programs for Spatial Morphology

According to the first model above we understand spatial morphology as the research
area defined by the intersection of architectural form and utilitas, here interpreted as
social performativity. According to the second model we are then able to define three
fundamental research programs for the field, aiming at an analytical, a critical and a
generative theory respectively. This does not imply that there is only space for one
type of each kind here and we therefore speak of a theory and not the theory. These
three research programs might actually not be the most urgent, a guess would be that
the field is more in need of three analytical theories than anything else, but the idea
here is to present the potential of the field rather than an immediate research agenda.

In relation to architectural practice, there is good reason to make a division
between the study of architectural form and urban form, since they support different
practices, architectural design and urban design. In the following outlines of research
programs concerning urban form with examples of concrete research projects are
presented. The first program is already well developed and has repeatedly received
funding for its different projects and can thereby be said to have gone full circle one
time and is ready for a second turn. The others are under development and are
therefore more sketchily presented. Together they present the ambition to create a full
theoretical support for the discipline of urban design in the form of a generative,
analytical and critical theory of urban form.
B.2. Research programme I – towards an analytical theory in Urban Design

B.2.1. General outline of research program I – The theory of spatial capital

Something that could be called a knowledge emergency has developed since our full comprehension of the need to develop our societies into sustainable societies. Since the release of the Rio declaration on environment and development, the agenda 21, there has been a massive redirection of research into the fields of sustainability. The outcome of this tremendous and many faceted work so far is yet to be summarised and fully comprehended.

One of the more important and urgent directions of this research is the field of urban development, where the triple bottom line of social, economic and environmental sustainability has been tackled separately as well as jointly in numerous studies. The urgency of this field is obvious considering that today a majority of the world’s population live in cities or densely populated areas. Still, the sheer complexity of cities in themselves, let alone the interplay of their social, economic and environmental systems, make the generation of applicable knowledge seem an arduous if not impracticable task. This is underlined by the fact that knowledge on one aspect of sustainability often is contra-productive to other aspects of it. For example, less car traffic is a step in the right direction for environmental sustainability but can prove bad for economical sustainability.

In this program it is proposed, following urban designers such as Talen (2003), urban morphologists such as Hillier (1996) and network analysts such as Kwan (2003), that a fundamental reason why we have such difficulties in generating knowledge in this field is that we have underdeveloped theories and methods when it comes to the analysis of what above was called cities in themselves, that is cities as spatial artefacts. The importance of this fundamental aspect of cities in relation to their sustainability is quite obvious. Firstly, the spatial aspect of cities set a framework that support their performance in a certain direction, and thereby their degree of sustainability. Secondly, few urban systems have such longevity as the spatial system, which makes it a prime tool for management of any long-term policy. Thirdly, more or less all urban activity takes place in space, which makes the spatial system strategic in handling the social, economic and environmental systems together and not as isolated issues.

The spatial system of cities then seem to carry the potential to set the framework for sustainability in cities, do this long-term, and be able to handle different aspects of sustainability jointly. But to put this potential to work presupposes a deep understanding of spatial systems in cities. What we are looking for in effect is the spatial logic of social, economic and environmental sustainability respectively, and in the end the spatial logic of sustainable societies.

B.2.2. Research projects in program I – Urban form and social sustainability

In a project called “Urban form and social segregation – from residential segregation to social integration in public space” and funded by Formas, the aim is to analyse social segregation from the point of view of public space rather than residential distribution. This approach mirrors the general approach of all research projects in the program to focus form rather than density, arguing that from the point of view of actually experienced segregation, the measured accessibility to different social groups
is more important than their mere geographical density. This project is well under
hand and a licentiate thesis is due in the beginning of 2009 (Legeby 2009,
forthcoming). Even so, the project has already resulted in an article in a theme issue of
Progress in Planning (Marcus 2007).

In this area the program also draws from extensive international research on
environmental design and crime, where the research group SAD has been member of
the steering committee for “Bo tryggt 05”, a document on crime prevention through
design initiated by the Police authority in Stockholm and widely spread and used
among developers and planning authorities. Joined to this is a research project
formulated called “Urban form and safety – the spatial characteristics of violent crime
and the perception of safety in urban public space”, which is still seeking funding.

B.2.3. Research projects in program I – Urban form and economic sustainability

In a project called “Urban form and economical sustainability – the spatial
prerequisites for the development of local economies”, also funded by Formas, the
aim is to discern, analyse and measure spatial properties in areas that have generated
strong local economies. Local economies are here primarily understood as local retail
and service companies. In the project the concept of market area has come to the
forefront, where it has proven possible to measure and show how urban form takes
part in the creation of both the size and composition of both markets aeas of supply
(customers) and demand (businesses). It has for example been possible to show how
the urban design for different suburban city-districts, independent of their density,
creates different sizes of the local customer market, heavily influencing the
sustainability of local shopping-centres. This project is to be reported in a
forthcoming article by Koch & Marcus, but preliminary theoretical discussions and
empirical results are presented in Elmlund & Marcus (2005).

An extensive study, encompassing large parts of the inner and outer city of
Stockholm, has been undertaken at Building and Real Estate Economics, KTH, with
support from SAD. The aim of the study was to, using space syntax and place syntax
analysis, with precise means describe locations and correlate these with three
economical parameters: floor area rents, real estate values and apartment prices
(Netzell 2007). This is a most promising survey of the relation between urban form
and economical parameters. A similar survey describing locations, using space
syntax, and correlating this with the location of different categories of lines of
businesses, showed a strong logic between urban form and the preferences of location
among different lines of businesses (Marcus, 2001, 2008).

B.2.4. Research projects in program I – Urban form and environmental sustainability

In a collaborative research project with Environmental Strategies Research, KTH,
called “Urban structure, urban life and sustainable energy use”, the intention is to
study the possibilities for three suburban city-districts in Stockholm to change into
more sustainable energy use. The project addresses both the physical structure and
actors in the planning process, such as planners and politicians, to see where and
when such a change could take place. A preliminary study is currently taking place
(Marcus 2008) which will be followed by a more thorough study (Ståhle 2009). In
both studies the physical structure will be analysed, trying to discern the relation between urban form and energy use.

In a project in collaboration with Karolinska institutet, the relation between design of the physical environment, everyday physical activity and health is will be studied in the autumn of 2008. Karolinska institutet has large study groups that have been studied over many years with detailed data on health status. In the new project these data will be correlated with data on physical activity, with the further possibility to also correlate such data with data on the local physical environment in the areas where the individuals in the study groups live, thereby making it possible to draw conclusions on the relation between urban form, physical activity and health.

B.2.5. Research projects in program I – Urban form and Analytical Tools

In a project called “Urban form and urban life – three descriptive models” funded by Formas, the aim was a close investigation of descriptions of three central issues in spatial analysis: density, accessibility and diversity. The result was a deep study of accessibility and its modes of measurement in adjacent fields to urban design in general and in space syntax in particular (Marcus, 2006). The stress on accessibility also proved to open new approaches to the description and measurement of density (Ståhle 2005) as well as diversity (Marcus, 2005). These approaches seem most promising to geographical description in general, since an accessibility approach can do without the in geography deeply problematic issue of area definition.

The project also resulted in a new GIS-application, developed in collaboration with NADA, KTH, called ‘The Place Syntax Tool’ (Ståhle, Marcus & Karlström 2008). The application makes it possible to measure accessibility in three ways: metrically as the bird flies, metrically following the actual network of streets and paths, and in axial steps, drawing from space syntax research, as well as combinations of them. This presents a unique possibility to measure and compare accessibility in different ways and draw conclusions on the performance of different urban designs, something that has proven a great advantage in the particular studies on social, economical and environmental sustainability presented below. The tool has also proven to be of great use in urban design practice.

B.2.6. Conclusions of the program: The theory of spatial capital

In a project funded by Vetenskapsrådet, all these projects are to be summarized and formalised in an analytical theory on urban form and sustainable cities called spatial capital (Marcus 2009). The general lack of analytical theories in the fields of architecture and urban design is a major drawback for an important and necessary generation of knowledge in fields hugely influential in the every-day working of modern cities and societies. The specific aim is to present philosophical foundations for such a theory, a GIS-tool developed for its empirical testing, and empirical results supporting it concerning the relation between urban form and social, economical and environmental sustainability.

B.2.7. A second turn of the program: The theory of compact sprawl
The foundations for a second turn in this research program are currently developed in a dissertation (Ståhle 2008). It concerns a deep analysis of the concept of density and how it is traditionally measured in Urban Geography. The analysis results in the introduction of the concept of compactness as well as ways to measure this, where the originality both lies in measuring density from the point of view of accessibility and measuring not only the accessibility to built space but open urban space as well. The idea is supported by empirical studies on different urban scales. This creates a strong foundation for further research in this direction that can prove to keep the research program alive and thereby contribute with further empirical and theoretical development in this area of knowledge.

**B.3. Research program II – towards a critical theory in Urban Design**

**B.3.1. General outline of research program II – The theory of urban capital**

It is well recognized that a spatial turn has taken place in a lot of social and cultural theory (e.g. Thrift & Crang 2000), but this “spatial variable” is extremely inconsistent and vague (Hillier 2007). Concepts like Castells’ “spaces of flows and spaces of place” and Florida’s “quality of place” refers to spatial phenomena without distinct analytical descriptions. It is certainly true that many of these authors have neither ambition nor interest to develop such descriptions, but it is also possible to argue that these theories could be made more powerful with such descriptions. Florida’s Creative class theory can serve as a case in point, where the concept “quality of space” obviously is a weak point, since its vagueness makes it difficult to make it operational. The aim of this program is then to show taking its point of departure in social theories such as Floridas, could be enhanced by adding more systematic analyses of space, thereby showing how a social theory can be developed if supported with a stronger spatial theory. Ultimately there is of course the possibility of new social theory relying on such analytical spatial theory.

The successful results of the research programme presented above has created the opportunity to use “the theory of spatial capital” in relation to social and economic theory and see how it can enhance such theories, which often lack powerful analytical theories on space. Once again we see here how this also creates the possibility of several different research project in this direction of importance in themselves but also together adding up to the possibility of more general theoretical summary of the field. Below is therefore a first project presented focusing on the relation between spatial capital and social and human capital as interpreted by Richard Florida. Coming projects aims at e.g. the relation between spatial capital and economic capital as interpreted by Krugman. In the end the aim is to in such studies build on spatial capital as an analytical theory on urban form towards a critical theory on urban form and its relation to society, tentatively called “the theory of urban capital”, taking the unusual route of using architectural theory to understand society instead of using social theory to understand architecture and urban design.

**B.3.2. Research projects in program II – Can spatial capital enhance human capital**

The globalization and internationalization of the conditions for trade and industry sets new rules for international economic competition (e.g. Dicken 2007). This means an
increased competition between nation states but particularly and characteristically between regions (e.g. Florida, 2002, 2005, 2008). The ability for regions to develop conditions for innovation in product and service development will determine their position in the global economy. This is achieved through attracting people, capital and technology at the forefront of the knowledge driven economy by offering economically and culturally dynamic cities supported by efficient infrastructure, clean environment and thriving urban cores. What is at stake is economic growth and the connected issue of welfare distribution, that is, economic sustainability for society’s inhabitants.

This project specifically addresses two levels of trans-disciplinary research. First, it aims at an analysis of the relation between the spatial constitution of urban regions and their relative success in the international competition for talent, capital and investments, that is, a collaboration between spatial and economic disciplines. More specifically it aims at spatial analysis both on the macro scale, concerning the relation and accessibility between urban nodes in such a region and on the micro scale, concerning the spatial structure of the nodes in themselves. Such an aim, secondly, also presupposes a trans-disciplinary collaboration within the spatial disciplines, where the macro scale analysis is a typical study for urban geography, while the micro scale analysis rather belongs to the discipline of architecture and urban design.

B.4. Research program III – towards a generative theory in Urban Design

B.4.1. General outline of research program III – A design theory of urban development (yet to be fully developed)


Design har under senare år blivit ett ”catch word” som dyker upp i de mest skilda sammanhang. Det är positivt då det tyder på att vi nu är beredda att ta fasta på Herbert Simon’s (1969) vision om en ”science of the artificial”, vid sidan av en ”natural science”, något som i vår samtid där alltmer är människoskapat snarare än naturgivet förefaller mycket angeläget. Samtidigt är det tydligt hur de teoretiska grunderna för en sådan vetenskap är svaga. Den mest utvecklade teorin inom design och dessutom den med klart längst historia återfinner vi inom området arkitektur och stadsbyggnad. Sedan Alberti på 1400-talet finns här en obruten tradition av teoretiska
modeller och traktat som kan sägas just försöka etablera en "science of the artificial". Av särskilt intresse är här försöken att utveckla en samlad stadsbyggnadsteori eftersom dessa försök har ett så nära förhållande till utvecklingen av mer allmän samhällsteori.

De bidrag till teoretiska modeller om staden som, särskilt sedan upplysningstiden, formulerats har stor inverkan på vårt sätt att förstå och utveckla kunskap om staden och därmed etablera grunderna och ramarna för interventioner i den, det vill säga vår design av den. Denna historia karaktäriseras dock långt ifrån av sammanhållna och konsistenta teorier i traditionell mening utan utgörs i hög grad av enskilda fragment och studier av specifika städer eller stadsdelar där dessutom begreppet teori förstås på skilda sätt. It is obvious how these theories for the most part are deeply normative, arguing for certain ideals, rather than analytical arguing from the point of knowledge. Their role has therefore rather been that of generative theory, that is theory as it is understood in art, where its role rather is to delineate how things could be rather than how the actually are. Even though this in a traditional scientific context more or less is the oppsoite of theory, it is in the context of design theory of great interest and necessity.

B.4.2. Research projects in program III – A critical history of theories in urban design


Avsikten med projektet är därför att skriva en analytisk och kritisk idéhistoria över staden som byggd artefakt för perioden 1789-1989 med utgångspunkt i en serie klassiska stadsbyggnadsteoretiska texter, där syftet både är att skapa en teoretisk ram för detta kunskapsområde men också bidra till en bättre förståelse av denna teoritradition som bidrag till utvecklingen av en designteori. Mer specifikt kan ett sådant ramverk fungera som en analys av generativ teori.
C. Spatial Morphology as a field of education

C.1. Educational programs in Spatial Morphology

C.1.1. The confusing concepts of theory and practice

Educational programs can either aim at academic or professional futures for the student. This is often simplified by saying that the one aims at theoretical study of a field while the other aims at the practical application in a field. But the concepts theory and practice often run the risk of hiding more than they reveal. In real life all action is practice, including the theoretical study of a field of knowledge, and it is actually quite difficult to imagine a pure theoretical activity. It is for example easy to see how research, which is normally considered a theoretical activity, is an unusually sophisticated practice, drawing on knowledge from a multitude of fields outside the one where the actual research is taking place and comprising forms of knowledge, such as intuition and aesthetics, normally not associated with scientific work. What happens in educational programs that aim at that kind of theoretical study of a field is that the students, besides being taught the theoretical content of the field, are trained in the sophisticated practice of theoretical study and research.

Similarly there is no practice without theoretical foundations. On the most fundamental level theories are some kind of coherent idea about the world, in parts or as a whole, and in real life it is impossible to imagine any kind of activity that does not have such an idea as foundation – the theory can have extremely weak foundations but there certainly needs to be one if we are to see any action. Such ideas do not only concern the surface of things but also imply quite deep philosophical assumptions on the workings and constitution of the world. What happens in professional education then, besides the practical training in the field, is that these ideas and theories become stronger, both the ones we are aware of that we have and the ones we are unaware of that we have.

C.1.2. Academic and professional programs in Spatial Morphology

It is then quite easy to imagine an educational program in the field of Spatial Morphology aiming at the theoretical study of the field in the form of research, that is, a PhD-program specialising in Spatial Morphology. It would comprise courses in the theory of the field as well as theory of science in general apart from the practical training in the research methods and techniques used in the field. All the knowledge necessary for such a program would not be possible to harbour within a department of Spatial Morphology but would presuppose collaboration with other departments specialising for example in the philosophy of science. Of course one can also imagine individual courses preparing students, for example in a master course, for further studies in theoretical study and research in Spatial Morphology.

It is more difficult to imagine an educational program in Spatial Morphology aiming at professional practice in the field, since the field then simply seems too narrow. Rather Spatial Morphology must then be part of a wider field of knowledge, since a professional practice never belongs to only one field of knowledge. That is so since practice, be it how we get by our every day lives in general or what we do in our professional lives, always comprises knowledge, not only from different fields, but
knowledge of different kinds, such as theoretical knowledge, skills and judgement. At the same time, educational programs aiming at professional practice are normally developed from a central field of knowledge like for example the Architectural Program or Spatial Planning Program at ABE, with their central fields of knowledge in architecture and spatial planning respectively, even though these programs are supported with courses and knowledge coming from other fields of knowledge. This presents at least in principle that Spatial Morphology could be such a central field of knowledge for an educational program aiming at professional practice.

More obvious is of course how Spatial Morphology could be a supportive field of knowledge in quite a few other educational programs aiming at professional practice, for example the Architectural Program and Spatial Planning Program earlier mentioned. The earlier analysis of the potential field of knowledge in architecture implies exactly that Spatial Morphology is an important field of knowledge in the education of architects both when it comes to architectural and urban design. It is therefore reasonable to see how Spatial Morphology would be an inherent part of the architectural program just as Architectural Technologies or Architectural History.

C.1.3. Possible educational programs in Spatial Morphology

We can then summarise and say that there are at least three potential areas where we can see Spatial Morphology as an important part of educational programs. First, as part of a PhD-program, for example in Architecture, or as a PhD-program in Spatial Morphology in itself, where the latter at the moment seems unrealistic but could be something developed in the future. Second, as supportive field of knowledge in educational programs aiming at professional practice, for example the Architectural or Spatial Planning Programs at ABE. Third, as the central field of knowledge in an educational program aiming at professional practice. Where it is quite easy to imagine the structure of the programs in the first two as well as the specific role of Spatial Morphology in them, it is less so concerning the third. In the following a recently launched master course at ABE, where Spatial Morphology to quite some extent could be said to be the central field of knowledge, will be presented as a means to make it plausible that Spatial Morphology could play that role in an educational program of this kind.

C.2. Background and aims for Urban Planning and Design (UPD)

C.2.1 The commission of the UPD

In 2005 it was decided to launch a new international two-year master course at ABE called Urban Planning and Design (UPD). The course was directed at a professional field located between spatial planning and urban design and has the ambition to combine large parts of these established areas of knowledge as well as identifying a new professional field. The aim with the initiative was two folded, first, to create an attractive course in an area of knowledge where ABE is the leading university school in Sweden and internationally also hold a prominent position, why such a course has the potential to both fill a need and be a success. Second, and more original, to develop and deepen the collaboration between the Department of Architecture (A) and the Department of Urban Planning (UP), recognising their very different
knowledge traditions and pedagogical approaches. The idea was to see if this could work as a spearhead for further collaboration between departments at ABE, especially when it comes to more dynamic and invigorating educational programs, but in extension also when it comes to research. The commission for the development of this new program can then be summarised:

- to create a new and internationally competitive master course
- to develop a synthesis of the two knowledge traditions of A and UP
- to develop a synthesis of the two pedagogical models at A and UP
- to identify a new professional field between urban planning and urban design

These are all quite demanding tasks, where the first one is maybe what you normally work with and is demanding in itself. The development of the program is then not expected to be accomplished overnight but is a long-term effort of great principal interest for ABE. Still quite many steps have been taken towards these aims and in the following the result of this work so far is presented.

C.2.2. The knowledge profile of UPD

There were many options for the profile of the new UPD-course where courses of similar or related nature could work as models. In an international perspective it is possible to speak of at least three possible approaches. First, a course of this kind can be based on a “star faculty”, that is, creating attraction and high quality through the people working in the course, especially if you have prominent and well-known people in your staff. Second, you can give the course a thematic profile concerning some fundamental aspect of urban planning and design where one feels the university has an unusual strength, for example, sustainable development or advanced design. Third, the course can be given an ideological bias, in the sense that it promotes a certain design ideal such as New Urbanism or Modernism. For the new course at ABE, none of these alternatives was considered attractive or feasible. There was no “star faculty” and thematic or ideological biases were considered limiting to the true potential of the course.

The profile chosen was instead a knowledge profile, which at first maybe does not seem to be an attractive label under which to market a new master course. But the idea was to take the more original part of the commission for the new course seriously, that is to develop a synthesis between the two knowledge traditions of A and UP and create a knowledge foundation for a new professional field, thereby also aiming at a long term relevance of the course. What was meant by a knowledge profile will be developed later on, but in short concerns that the course, both in its organisational structure and in the content of the individual units, would emphasise the epistemological and theoretical character of the knowledge taught in the course. Put differently, contrary to normal procedure in courses of this kind, the theoretical foundations for the professional practice in the field would be stressed to the students. That is, not only stressing that there is a lot of theoretical knowledge on different aspects in the field, primarily developed in research, but that professional practice in the field has inherent theoretical foundations. That is, turning the professions of planners and architects from experience based crafts to theory based professions. Certainly, the aim here was not to let this in any way impede on the regular design
training typical for these professions and especially architects, rather to let this theoretical dimension of design support and strengthen the design work.

C.2.3. The central knowledge object in UPD

Such an ambition presupposes a thorough epistemological analysis of the field of knowledge the program comprises. It is then obvious how the field is extremely vast. Today more or less all human activity takes place in cities and thereby formulates their specific demands on their planning and design. This easily leads to an unmanageable list of knowledge necessary to deal with in the program. It is therefore important to identify the core object of knowledge for this particular program, since in actual practice one will rely on the contribution and collaboration with other professionals in related disciplines. Drawing from the practice of the two disciplines that today dominate this field, spatial planning and urban design, it is quite easy to identify urban space as the central object of knowledge in the program. Even though the planning and design of cities touches on an extremely vast field of knowledge, what in the end is the central concern here is to in relation to these other fields professionally structure and shape urban space.

Such a conclusion is important since it limits the ambition in the program, which otherwise both runs the risk of suffocating under its own weight and create a week identity. What primarily is of interest in the program then is knowledge that can support the structuring and shaping of urban space in relation and support of different needs formulated in society. At the same time, this creates new challenges in that our knowledge on how knowledge from related fields, such as economic and social studies on cities, are translated into particular designs of urban space is not very developed. This translation, furthermore, concerns a translation not only from one field of knowledge to another but a translation from one medium to another in that what has to be managed is the translation from texts and numbers into form, which formulates quite deep philosophical question for the full comprehension of this field. This will not be dealt with here but is a task for the full theoretical development of Strategic Urban Design as a field of knowledge.

C.2.4. The central knowledge process in UPD

What is important here is that this makes it clear how this field of knowledge as a practice, is inherently about design knowledge, and here we mean that spatial planning just as well as urban design can fruitfully be understood from the point of view of design theory. Design is a process that is exactly about synthesizing knowledge from many different fields into a complete artefact. Characteristic for this process is the coming together of different forms of knowledge, such as theory, skill and judgment, while it certainly also is about bringing together knowledge from different fields of knowledge. We therefore need two epistemological analyses of the field. First, an analysis of the properties and character of its central object of knowledge, that is, urban space, and second, an analysis of the process of knowledge in which this object is structured and shaped, that is, urban planning and design. We will in a first section discuss urban space as an object of knowledge and in the following section urban planning and design as a knowledge process.
C.3. Epistemological analysis of the field of knowledge of UPD

C.3.1. The different character of urban space in spatial planning and urban design

Even if the two disciplines have a central object of knowledge in common their particular fields of knowledge are not unproblematic to synthesise. This is so since the two disciplines have their roots in quite different knowledge traditions. A short comparison of the two can help clarify this.

The understanding of urban space in spatial planning has its roots in a geographical tradition, while the understanding of urban space in urban design has its roots in architecture as another, albeit scientifically less developed, spatial discipline. This gives the two disciplines quite different fundamental assumptions about the character of urban space. First of all, geography is a descriptive tradition and therefore does not in itself carry any immediate keys to planning which normally implies change of some kind. Rather we here see the prime discipline in “mapping”, that is the development of knowledge on how things are, not how they could be. Architecture on the other hand is in its essence an intervening discipline where the central instrument is not the map but the design, be it for a building or an urban area, that is, an instrument for how things could be rather than how they are. The actual practice of planning was also for a long time primarily conducted by architects and since the rise of special educational programs for planners, these programs have been quite influenced by the training of architects.

This could lead to the conclusion that urban space in planning has a more static character and in architecture a more dynamic character, since the first draws so heavily from a descriptive tradition. This does not seem to be true. Of more importance, and pertaining to this, is what it is that is mapped and designed in the two disciplines respectively. Simplifying a little, what is mapped in geography are different “contents” in space, such as people, institutions or economic activities. All these contents can then give rise to thematic maps of their spatial distributions. In architecture what is designed is not so much the distribution of such contents as the distribution of “space in itself”. The intent of the architect is to structure and shape space, often with an idea of for example its use, but the uses are not part of the architect’s material in the way it is for the planner, rather the material for the architect is space in itself. An important distinction therefore is between geography which primarily deal with the distributions in space and architecture that primarily deal with the distribution of space.

This is of fundamental importance when it comes to the different understandings of urban space in spatial planning and urban design respectively. In architecture urban space quite specifically has to do with the shape and structure of space in itself, not irrespective of its content but always with space as an intermediate to this content, while urban space in spatial planning has more directly to do with the distribution of different contents in space. To be more specific, in geography, there is no such thing as “space in itself”, since there simply is no such thing on the surface of the earth. Space is instead defined by what we here have called the distribution of contents in space, there simply is no intermediate. It is this understanding of urban space that is transmitted into the discipline of spatial planning. As a result what is planned in spatial planning are such contents, that is, different such contents are given a certain location and spatial extension in a plan. We can see this in the fact that what planners predominantly work with is the development of different land-use plans.
In urban design, on the other hand, what is designed is never what we have called contents but spatial containers for such contents, and, furthermore, containers for spatial relations of such containers. That does not mean that these contents, for example in the shape of different land-uses, are irrelevant, but they are not addressed directly in urban design but through the intermediate of what we have called space itself. A conclusion of this is that if the knowledge tradition that underpins urban and spatial planning is geography, the knowledge tradition that underpins architecture and urban design rather is geometry. If we for a while then understand the urban planning and design process as a relation between form and function, we can say that spatial planning starts with functions, that is, all the different contents that have or need to get a location and spatial extension, while architecture starts with form, that is, the adequate and attractive shape and structure to space as to accommodate different contents. This distinction between spatial planning as at bottom a functionalist approach to urban space and urban design as at bottom a formalist approach to urban space is of fundamental importance for the development of the new field of knowledge that UPD represents and in that context needs to find a successful reconciliation.

![Urban Space: In the knowledge tradition of Spatial Planning](image)

Fig. 4 The understanding of urban space in the knowledge tradition of spatial planning.

If this is one fundamental difference in the understanding of urban space in the two disciplines, a second one is the simple fact that they traditionally work on very different scales of cities. Spatial planning work on a comprehensive level dealing with the general distribution of land-uses within a municipality for example, while urban design work on a detailed level, dealing with the design of a housing area for example. This is reflected in the institutionalised planning process in Sweden where the two primary documents are the comprehensive plan and the detailed plan, where one roughly can say that the first primarily is a product of spatial planners and the second the product of architects.

As a result of this we have two professional disciplines that are able to deliver quite competent work in their different areas. We therefore find both well developed comprehensive plans that give different land-uses relevant location, delimit and protect valuable green areas and creates space for new investments in infrastructure
etc, and careful and attractive detailed plans for example housing with well-shaped public spaces and good accessibility to retail and public transport etc. But we also find in a very concrete and visible way gaps between these two levels of urban development. When one leaves the well-planned housing area one enters a strange landscape of highways and green-belts. The two levels of planning simply do not seem to connect with each other and that in two dimensions. On the one hand, there is a gap between the comprehensive scale and the detailed scale where one when moving between them seems to enter different worlds. On the other hand, there is a gap between different areas on the detailed scale since these seem unable to create a continuity of the city but a patchwork. These gaps are problematic since the root to them is the division into different disciplines with different knowledge traditions and as we have seen even different fundamental understandings of urban space. This means that the gap is not so easily bridged.

**Urban Space:**

*In the knowledge tradition of Urban Design*

- Architectural tradition
- Detailed level
- Life world
- Distributions of space

*Fig. 5 The understanding of urban space in the knowledge tradition of urban design.*

It is a truism that how we act upon the world is based on what we know about the world. What is less recognised is that what we know about the world is based on how we describe the world. If we primarily understand urban space as the spatial extension of land-uses, we can develop knowledge on how to deal with these, which then can support professionals in spatial planning. Similarly, if we understand urban space as the shape and structure of urban space in itself, we can develop knowledge on how to design such space, which can support professionals in urban design. As a consequence the very appearance of cities, that is, how we have planned and designed them, is based on our current knowledge and understanding of them. But this means that we also can detect gaps in such knowledge on the very surface of cities. Such knowledge gaps are exactly what we meet when we move around our cities today, for example in the case above when we left the carefully designed housing area and entered a the landscape of highways and green-belts.

To capture more exactly what this gap in knowledge, concerning the different scales the two disciplines primarily are active on, is about, we need to be more precise on what characterises the knowledge on the comprehensive level of urban planning and the detailed level of urban design. The comprehensive scale which dominate the
practice of spatial planning lead to a rather abstract understanding of urban space, that is, as something external and rather distant to oneself. This abstract understanding of space is strengthened by the earlier observation that what is primarily dealt with in spatial planning is urban space as defined by the distribution of certain land-uses in space. Such distributions are most of the time quite difficult to experience in real life. Both since in real life many different land-uses overlap of which many might not be directly visible. Taken together, this leads to a particular understanding of urban space that we can call a system-perspective, drawing on a concept from Jurgen Habermas.

In urban design, on the other hand, which primarily is active on the detailed level, the understanding of urban space becomes more concrete, as something we actually can experience and perceive. This is similarly strengthened by the understanding of urban space in urban design as space in itself, which most of the time is designed exactly from the perspective of an experiencing subject. This, on the other hand, leads to an understanding of urban space that we, once again drawing from Habermas, can call a life world-perspective. What we experience in the example above when moving from a well designed housing area and enter a confusing landscape of highways and green-belts is exactly the movement from urban space designed from a life world-perspective to urban space planned from a system-perspective. So if we earlier were able to identify one fundamental difference in the understanding of the central object of knowledge in the field between the two disciplines, what we called the functionalist approach in spatial planning and the formalist approach in urban design, we can here identify a second one. In spatial planning there seems to be a predominant system-perspective on cities while there in urban design seems to be a life world-perspective.

It is important to stress that this does not imply that the one is better than the other, for example that a life world-perspective is better or more relevant than a system-perspective. The conclusion is rather that they have proven successful on their individual arenas and that cities are fruitful to understand both as systems and life worlds. The problem is rather that we have two quite isolated disciplines with very different understandings on what cities are which do not collaborate much and that that is something that leads to an unsatisfactory planning and design of our cities, something we quite often can experience in real life. What we need then is a deeper collaboration between the two disciplines both in the development of new knowledge in research, where it is likely that they have a lot to learn from each other, not least if their fundamentally different understandings of cities are made clear, but also in the application of knowledge in professional practice. It is then clear how a possible further step of this is a merge between the two disciplines into one or the development of a new intermediating discipline between the two. It is exactly these possibilities that the UPD-program explores.

C.3.2. The character of urban space in UPD

The investigation so far can be seen as a contribution to one of the main tasks in the development of this program, that is, to create a new professional field between urban planning and urban design, where we here have identified quite precisely where such a field is located and what kind of fundamental knowledge questions it needs to answer. But it is also a contribution to the task of to developing a synthesis of the two knowledge traditions of A and UP, where we here quite specifically have been able to describe some fundamental aspects of these two traditions. In summary, if we believe
that how we act upon the world relies on what we know about the world and that this in turn relies on our fundamental descriptions and understandings of the world, we can at the moment see a unreconciled conflict in the development of our cities between a functionalist system world approach in spatial planning and a formalist life world approach in urban design.

The problem here is not that one discipline for example tends to start with function and the other with form. What is implied in the epithet formalist or functionalist is that one's action has become ideology based rather than knowledge based, that is, that we for example believe that it is only function that matters or only form, or that we are so stuck in a way of thinking where for example function is so central that we neglect the development of knowledge in its relation to form. The same discussion can of course be made concerning the system or life world perspectives. To say that one's action has become ideology based is then not saying that one has chosen to adhere to a certain ideology but rather that one is not aware of the fact that one's knowledge has become limited and need further development. This is not something dramatic but a quite natural situation in the continuous development of knowledge.

What is argued above then is that we have reached a point where the two disciplines are coming close to being ideology based, at least on issues that relate to both of them, where, for example, both researchers and professionals in urban design have great difficulties to even imagine that space can be defined as something else than space in itself, and researchers and professionals in spatial planning have great difficulties exactly in imagining such a thing as space in itself. The truth rather seem to be that space can be understood in both ways and that an acknowledgment of this can lead to a true reconciliation and deeper understanding of the relation between form and function in urban development. Similarly, it seems like urban designers have come close to being ideology based in their practice in that they have great difficulties in handling the city as a system and rather wants to deal with in small isolated units, and that spatial planners have great difficulties in understanding cities as life worlds.

Now, this more or less in itself then defines both the field of knowledge to which the masters course UPD aspires and what needs to characterise its understanding of its central object of knowledge, urban space. First, it needs to reconcile the geographical and architectural knowledge traditions into a new combined tradition, where it can be said that what is characteristic for this new tradition is the emphasis of the geometric level of geographic description. That is, that both when we analyse cities in our efforts to develop new knowledge on them and when we plan and design cities in our efforts to apply such knowledge in real cases, need to acknowledge and critically handle the geometric aspect of urban space and how this relates to different uses of urban space. In our discussion we have seen how this concerns the reconciliation of distributions in space of what we have called different “contents in space” and distributions of space, that is, what we have called “space in itself”. What we aim at is making these connect with each other and the development of knowledge on their interplay so that we can develop true knowledge on what we can call the relation between form and function in urban space, thereby making urban planning and design more powerful and precise. We can say that what we are looking for is knowledge that can help us make the planning and design of the distribution of space support the distribution in space, that is, make them distributions through space.
Second, it needs to develop both knowledge and methods on how to reconcile the different scales of cities and here it quite obviously is necessary to develop this concerning the intermediary level in-between what today is understood as the comprehensive scale and the detailed scale. Put differently, we need to reconcile the understanding of the city as system and life world, where neither have preference but rather we need to acknowledge that the system to a high degree is generated and especially sustained by the life world and the life world generated and sustained by the system. Just as there is a risk in becoming a functionalist or a formalist not acknowledging the interplay between form and function, there is a risk of becoming a localist or a globalist without acknowledging the interplay between the global system and the local actions. Once again the aim must be to try to make these two levels connect and develop knowledge on their interplay. In this case it, furthermore, is likely that if we do not develop this knowledge we will probably not be able to develop knowledge on the form function-relation either. What we are looking for here then is planning of the system that can support the design of the life world, as well as the other way around, that is, system sustained life worlds and life world sustained systems.

If this can be successfully realised we have truly developed a new field of both knowledge and professional practice that to at least some extent merge the two now dominating disciplines in the field spatial planning and urban design. It is here proposed that this field of knowledge is called Strategic Urban Design (SUD).

C.4. Epistemological analysis of the knowledge process in UPD

C.4.1. KTH as a university of design

If the central knowledge object in the field of knowledge we here call Strategic Urban Design is urban space, we have already hinted at that the knowledge process behind
the professional shaping and structuring of urban space is design. Design is then normally more often connected to the field of Architecture than Spatial Planning, but that is not what is intended here. Rather it is important to remember that the design process as such is far from unique for the academic field of Architecture and that for example the activity of planning quite easily can be comprised under the concept. As a matter of fact, it is an important foundation for many fields of knowledge both at ABE and KTH as a whole. The introduction of the concept of design then should neither be regarded as a specific thing to Architecture or as something dramatically new to KTH as a whole. As a university of technology what is a stake at KTH is never only the generation of new knowledge through research or the dissemination of knowledge in educational programs, but also the innovative application of knowledge in new products and processes. Such application of knowledge is exactly what design is about. Thus, KTH could be looked upon, not so much a university of technology, as a university of design.

C.4.2. A descriptive model for the field of knowledge in strategic urban design

Strategic urban design work is about giving shape and structure to urban artefacts. Such processes comprise different phases. Most commonly recognised is the creative phase, where the designer sketches possible solutions to an urban space problem. But just as important is the predictive phase, where the designer tries to envisage the effects of the solutions; will it do the work. Such predictions can also be asked from a broader context, such as: how will my proposal be received in contemporary society. In the latter case the predictive phase is not so much about prediction as discernment and can therefore be called the assessment phase. In real life these phases obviously are interlaced in a continuous process. The important thing is to realise, first, that all of these phases are in need of theoretical support but, second, that this theory is of epistemologically different kinds and therefore generated in quite different ways.

Fig. 7. Generative theory as the theoretical support needed in the creative phase of the design process.
The bottom-line of the often mystified creative phase is to know how to apply experience in new situations. That is not to deny the intuitive dimension of creativity. Rather intuition to a large extent seems to be exactly about that, the ability to let former experience subconsciously lead ones action. As in life in general then, more or less any experience can be useful in strategic urban design, but more specifically it obviously has to do with experience in professional urban planning and design. This can concern experiences of urban artefacts as well as ideas on the urban. A creative designer is able to translate these experiences to a set of possible perspectives or approaches, a repertoire, from which it is possible to select a productive approach in relation to future specific architectural problems. Speaking from the point of view of theory in general this is a rather vague landscape of theory. Still, in architecture it has a very long history and it can be argued that the majority of architectural theory falls into this category, which we here call generative theory.

Fig. 8. Analytical theory as the theoretical support needed in the predictive phase of the design process.

It is maybe more obvious how the predictive phase need theoretical support. On what grounds can we predict the performance of urban artefacts when it comes to things like social segregation, retail attraction and energy consumption, for example. To a certain extent it is possible to once again go to experience of earlier cases. But characteristic of contemporary urban development is the complexity and uniqueness of each architectural project, which makes it difficult to transfer experiences from one project to another. Instead one needs to turn to some principle, which, if it is to be successful, furthermore needs to be empirically supported. What is needed then is theory of a more familiar sort, that is, scientific theory of a traditional kind, which here will be called analytical theory.

Now, the predictive phase needs to be elaborated a bit, since it is often misunderstood as the direct application of analytical theory, a reason why it has been so heavily criticised, not least as a tool in urban planning and design, since such an understanding obviously runs the risk of falling into technocracy. Analytical theory concerns what is going on in general. In real life different needs will be in conflict with each other, so that general rules need to be translated to specific situations. This
presupposes discernment in the architect, which research can support but never replace. Discernment is also necessary when it comes to “predicting” an architectural project’s performance in a larger context, such as how it will be received in its cultural or social context, what above was called the assessment phase. Such questions cannot be answered in the exact and often quantified way typical for analytical theory but needs support of a different kind, that is, theory as it is developed in the humanities and the parts of the social sciences inspired by the humanities. Such theory will here be called critical theory.

We then more specifically can see the different types of knowledge at work in the process of strategic urban design. In the creative phase we see the need for something we can call generative knowledge, in the predictive phase something we can call analytical knowledge and in the assessment phase something we can call critical knowledge. It is of course important to remember that these kinds of knowledge interact in different ways and sometimes one kind of knowledge can be put into use in the form of another. For example, critical theory is often supported by analytical theory, just as analytical theory can be put into context by critical theory, while both analytical and critical theory can work as generative theory.

C.4.3. The epistemological origins of the forms of knowledge in the design process

Now, there are two results of this description of the process of strategic urban design. First, it makes clear the central elements of knowledge at work in the design process and therefore that if one is aiming at new knowledge on the design process, all of these elements need to be acknowledged. Second, it is quite clear how the different kinds of theory referred to have rather clear origins in different knowledge traditions and therefore new knowledge within each of these will be generated in quite different ways drawing from different knowledge traditions. The conclusion is that since they
all are necessary for the development of new design knowledge each and everyone need to be respected for their different integral needs and traditions.

Analytical theory is clearly what we find in engineering and the natural sciences as well as the parts of the social sciences that are inspired by these knowledge traditions. Critical theory, on the other hand, has strong ties to the humanities and the parts of the social sciences that are inspired by the humanities. Generative theory, finally, does not fit into these knowledge traditions but rather have its roots in theory as it is understood in art, where the idea of theory is concerned with how things could be rather than how they actually are, the domain of traditional scientific endeavour. Generative theory being less acknowledged in academia needs some further elaboration, especially since it is a crucial element in the design process and since the field of urban design is extremely rich in such theory and that, furthermore, in two ways.

First, most theoretical production in urban design, from Camillo Sitte to New Urbanism, falls into this category. Even though it can be disguised as both analytical and critical theory, it most of the time is extremely weak as such theory. The aim of its authors is another, namely to expand the field of possibility in architecture, most of the time with a normative aim – the new possibilities the author is presenting are the ones that should be chosen – but it does not need to be read like that. Rather, such theory more often serves as inspiration, helping urban designers to broaden their own experience and repertoire with new possibilities in urban design. Second, the generation of architectural projects and designs are in themselves carriers of generative theory. Realised or not, such projects do the same thing as the architectural theories referred to above, namely presents new possibilities in urban design that help architects to expand their own experience and repertoire. The construction of Seaside is more likely to have promoted the ideas of New Urbanism than the writings of Andres Duany. This is the obvious reason the study of real cases has always played such a central role in urban design education.

Apart from the earlier conclusion that both most analytical and critical theory can serve as generative theory, the rather surprising conclusion here is that concerning generative theory it is clear how architectural history can play a critical part, since it is the area of knowledge that records the history of both architectural theory and architectural projects. With some afterthought, this is not so surprising since it is exactly in this way we can learn from history. History does not produce analytical knowledge from which we can predict what will happen, history is the prime science in collecting human experience, thus, history can help us expand our personal experience, as humans in general but also as professional designers. Apart from this less obvious source, there is a great range of possibilities develop generative theory, for example in experimental projects or student work.

C.4.4. The potential of generative theory at ABE and KTH

Some further comments concerning the more unusual form of knowledge discussed here, generative knowledge, are necessary. From the above it is clear how generative theory is an extremely important aspect of design theory in general and how the field of architecture can present a tradition of such theory without comparison in any other design field. Architecture here therefore has an extremely important role to play concerning the development of design theory at ABE or even KTH. As a matter of fact, if we look upon KTH as a university of design for a while, we can see how it is
exactly in this aspect of design that KTH generally is weak. Concerning analytical theory and thereby the predictive phase in the design process KTH has a most solid base to stand on in the many fields of knowledge the university comprises, not least Spatial Planning. Likewise one has many schools and departments that in recent years have expanded its knowledge and awareness when it comes to critical theory and thereby what we have called the assessment phase in the design process, including Spatial Planning and Architecture. But when it comes to generative theory KTH is generally speaking weak. The prime exception to the rule is the Department of Architecture, where exactly this aspect and phase of the design process has been consciously studied and even theorised for a long time.

On the other hand, if Architecture has an exceptional record when it comes to generative knowledge, and like the rest of KTH in recent years has expanded its knowledge and awareness concerning critical theory one is weak when it comes to analytical theory. This is deeply problematic for the field of knowledge of architecture and especially its practice for two reasons. First, it is problematic because it leaves practicing architects without powerful tools to predict the effects of their work. The perpetual criticism of architectural work during the 20th century where the credibility for Swedish architects finally sunk to an all time low can be seen as an effect of this. Second, even though one have generated both an interest and growing awareness of the importance of critical theory and thereby setting architectural work in a larger social and cultural context, leaving its technocratic tendencies, such theory can be difficult to tie to individual architectural projects without the support of analytical theory.

The master program here discussed then seems most fruitful in joining the specific strengths in the two departments of Architecture and Spatial Planning into something that can be called Performance Based Design. But this can also be seen as spearheading a more conscious design approach in professional training and professional knowledge application that can prove a interesting also for other educational programs at ABE and KTH, both when it comes to attracting new students and in achieving professional success for finished students.

C.5. UPD Masters - Förslag till struktur och generellt schema

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<td>40% Transport Planning</td>
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<td>Karin Bradley (S)</td>
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### UPD 2009: Course Schedule

#### Third semester

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Jjerker Söderlind (S)

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Tigran Haas (S)
Bojan Boric (A)

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Reza Kazemian (S)

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Chosen supervisor (AS)

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Chosen supervisor (AS)

### UPD 2009: Course Schedule

#### Fourth semester

| Thesis in Urban Theory |

Chosen supervisor (AS)

| Thesis in Urban Design |

Chosen supervisor (AS)
D. Spatial Morphology as a field of practice

News from nowhere

Kunskapsfältet


Kanske kan man tolka detta som ett tecken på att även byggbranschen är på väg in i kunskapsamhället och att arkitekterna faktiskt spelar en viktig roll i detta. Byggnadsbranschen är i mångt och mycket low-tech men det innebär inte att det kunskapsområde den representerar är simpelt. Byggnader och städer som fysiska artefakter är i grunden ytterst sammansatta system och svåra att utveckla djup kunskap om. Det är förmodligen just denna kombination av enkellhet på ytan och komplexitet i grunden som fördröjt branschen. Å ena sidan har man inte sett behovet av en djupare kunskapsutveckling, å den andra har det helt enkelt varit svårt.


Den funktionella sidan har på samma sätt en oerhörd utvecklingspotential. Det är fortfarande mycket rita-gissa-spring över det hela med ombyggnader av kontorshus före första inflyttning och stadsäkta stadsdelar utan stadsliv som följd. Här finns ju fantastiska utsikter att genom bättre kunskap med en helt ny precision kunna leverera hållbara stadsdelar som verkligen är hållbara, bostäder som verkligen svarar mot människors behov och kontorslokaler som verkligen spelar en aktiv och stödjande roll i ett företags verksamhet. En arkitektkompetens med en utvecklad precision i dessa saker skulle öppna för att arkitekterna återtag och leda en ledande roll i byggprocessen. Arkitekters uppgift har alltid varit att inskriva det unika värdet i varje

1 Artikel i Tidskriften Arkitektur nr 8, 2008.
nytt projekt men i dagens komplexa situationer krävs en mer förankrad förmåga att artikulera och träffa rätt när det gäller detta.


Kunskapsutveckling

Det kan i detta sammanhang vara intressant att titta närmare på företaget Spacescapes verksamhet. Vad Spacescape erbjuder kan just beskrivas som en mer kunskapsintensiv arkitekttjänst som artikulerar och kvalitetssäkrar byggbranschens slutprodukter, eller som bevakar och garanterar samhällsnyttan utifrån offentligt uppstatta mål - om man föredrar det. Kunskapsintensiv handlar här inte om att kunna mer om arkitektur i allmänhet utan om att på allvar låta arkitekturforskningens resultat bli en naturlig del av arkitektkompetensen. I just detta fall handlar det om forskning som utvecklar vår kunskap om egenskaperna hos de fysiska artefakter som arkitektarbete genererar.

En orsak till att det varit svårt att se den grundläggande komplexiteten i byggnader och städer är att vi haft så få verktyg som artikulerar den, gör den synlig för oss. Inom forskningen är en grundregel att de fenomen man vill studera inte bara finns där färdiga att studera. Istället är en central uppgift att producera dessa fenomen. Tänk till exempel på teleskopet och mikroskopet och hur de gjorde det möjligt att lyfta fram fenomen som före deras tillkomst stod utanför kunskapsutvecklingen. Inom
arkitekturforskningen har man dock i allmänhet nöjt sig med att studera sina studieobjekt så som de oförmedlat presenterar sig för våra ögon.

Om man istället utvecklar verktyg som beskriver aspekter av de arkitekttoniska artefakternas genom att ställa enkla frågor till dem som till exempel, vilket rum i denna byggnad är närmast alla andra rum, eller vilken punkt är mest överblickad från alla andra punkter, produceras beskrivningar som fångar egenskaper i dessa artefakter som inte är möjliga att direkt uppfatta med ögat - inte ens ett tränat arkitektöga. Liksom datorer i dag kan hjälpa oss att generera och bygga nya arkitekttoniska former kan datorer även hjälpa oss avtäcka egenskaper hos arkitekttonisk form som varit dolda för tidigare teknologier. Ett annat enkelt sätt att åstadkomma liknande beskrivningar är att göra systematiska observationer av hur människor använder platser och byggnader.

![Diagram](image)

Fig 2. Södermalm – fenomen avlockade en urban artefakt genom att ställa enkla frågor till den: hur många människor när jag inom en radie på 3 gator från varje fastighet om jag följer gatusystemet. Rött står för höga värden och blått för låga.

Den forskning Spacescapes verksamhet stödjer sig på handlar framför allt om analyser där avsikten är att producera fenomen med betydelse just för hur byggnader och städer används, till exempel hur människor rör sig eller hur man väljer att använda olika platser. Här har just sådana analyser där rums inbördes samband eller olika platsers överblickbarhet visat sig vara av grundläggande betydelse. Det visar sig att det finns systematiska samband exempelvis mellan gators närhet till varandra och vilka som används mer än andra när man rör sig genom en stad eller att vem man har mer utbyte med på jobbet kan ha att göra med var denne sitter i ett kontorslandskap.

Mycket av denna forskning har rötterna i *space syntax*-forskningen men på KTH:s arkitekturskola arbetar forskargruppen Spatial Analys och Design (SAD) med att bredda denna forskningsinriktning till något mer generellt som kan kallas *rumsmorfologi* (*spatial morphology*). I detta arbete har man utvecklat flera egna analysmetoder och mått. Det handlar framför allt om hur byggd form på olika sätt inverkar på *tillgänglighet*, *täthet* och *diversitet*, något som bland annat sammanfattats

![Image](image.png)

*Fig 3. Odenplan – fenomen avlockade en urban artefakt genom att göra enkla observationer av människors användning av den: Mängden människor som passerar olika gåtnät vid Odenplan (till vänster); människors vägval över Odenplan fångat genom att följa ett stort antal personers väg över Odenplan (till höger).*

Det kan också handla om att mäta täthet på nya sätt och som bättre svarar mot hur människor faktiskt upplever den och där tillgängligheten till grönområden vägs in, något som kallas *kompakthet*. Dessa täthetssätt visar sig ofta fångsaker av större betydelse i planeringen än gängse täthetssätt. Eller så kan det handla om att beskriva rummets differentierande förmåga, det vill säga dess förmåga att skilja det ena från det andra, och därmed skapa grundläggande förutsättningar för diversitet.

Det Spacescape arbetar med kan därför kallas forskningsbaserad design, vilket också skulle kunna kallas en mer kunskapsintensiv design. Det betyder inte att man är bättre när det gäller den *generativa* sidan av design, den sida vi talade om i inledningen och där det handlar om att ta fram möjliga lösningar på arkitektoniska problem. Det Spacescape försöker vara bättre på är den *prediktiva* sidan av design, det vill säga kunskap om huruvida dessa lösningar verkligen kommer att fungera och leverera det de är avsedda att leverera.

Med lite perspektiv kan man säga att detta är och har varit det stora kunskapsproblemet inom arkitekturen. Det är svårt att påstå annat än att vi kontinuerligt under 1900-talet såg en rikedom av uppslag och koncept som genererade ny och intressant arkitektonisk form. Problemet har varit att denna form alltför ofta inte hållit vad den lovat när det kommer till sådant som användningen av stadsrum och funktionaliteten i mer komplexa byggnader, det vill säga den prediktiva sidan. Det är framför allt här det finns utrymme för en avsevärd utveckling av arkitektkompetensen, bland annat genom att ta tillvara de framsteg som görs inom arkitekturforskningen på detta område.

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Kunskapstillämpning


Ett exempel där ett sådant samarbete varit mer fördjupat och skett över en längre period är arbetet med Västra City för Jernhusen tillsammans med Rosenbergs och Paju Landskap. Där har en genomgripande bearbetning gjorts av ett tidigare förslag i nära samarbete mellan de olika arkitektföretagen som lett till ett förslag där den stora om- och tillbyggnaden av Centralstationen på ett helt annat sätt än det tidigare förslaget kopplas upp med den omgivande staden och därmed kan bidra till att både läka samman denna illa behandlade del av staden och bli en del av det offentliga rummet.
Fig 5. Överlagring av ett flertal rumsanalyser och observationer för att fånga vistelsevärden i nuvarande Centralhallen på Stockholms centralstation. Blå-grä skala visar graden av överblickbarhet, röda prickar människor som står, vita prickar människor som sitter, ljusblå områden förekomst av sitplatser, lila områden var informationstavlor är synliga och vita linjer hur människor väljer att röra sig i hallen.

Alla uppdrag har dock inte offentliga beställare och handlar om stadsbyggnad. Ett intressant exempel som visar hur en kunskapsutförrättning av det här slaget kan bidra till inte bara nya projekt utan artikulera egenskaper och kvaliteter på redan befintliga byggnader har varit uppdrag att utvärdera fastighetsbestånd, uppdrag som kan sägas resultera i att fastighetsutförrättare fått en klarare och mer distinkt bild av karaktären och därmed potentialen hos sina fastigheter. Lite annorlunda uttryckt så fick de en bättre bild av den vara de erbjöd sina kunder och kunde med det som utgångspunkt med större precision både förstå vilken fastighet som passade vilken hyresgäst och ta
fram ett fastighetsutvecklingsprogram som överensstämde med de enskilda fastigheternas möjligheter.


Förklaringen kom i en serie rumsanalysyer gjorda för hela innerstaden. Där andra platser trädde fram som viktiga noder även för sina närmaste näromgivningar en till två gator bort, var det först vid avstånd på över tio gator som Slussen började framträda som en knutpunkt. Slutsatsen var att Slussen har den för Stockholms innerstad närmast unika egenskapen att vara en viktig plats när man rör sig långa sträckor genom innerstaden som helhet men att platsen i princip saknar kontakt med sitt närmaste omland, dels därför att det helt enkelt inte finns mycket omland till detta näs, dels därför att Slussens nuvarande utformning snarare ökar än minskar avståndet till det omland som finns och dels därför att där finns så lite bebyggelse. Den enda plats i innerstaden som liknade Slussen i detta avseende var talande nog Tegelbacken.

Studien bidrog därmed till den principiellt intressanta iakttagelsen att det finns platser i staden som karaktäriseras av en mer renodlad relation till staden som helhet utan lokal förankring, ofta typisk just för stora kommunikationspunkter som järnvägsstationer och liknande, vilka skiljer sig från det vi oftare tänker på som stadsdelar huvudsakligen färgade av sitt närmaste grannskap eller den typ av stadsdelar som Jane Jacobs talar om där det lokala grannskapet och den stora staden möts på samma gator och platser.

Sergels Torg är ett annat klassiskt diskussionsobjekt och trots att det kanske är enklare att förstå hur platsen rent rumsligt hänger ihop är det frågan om en rumsbildning uppbyggd med subtilare medel än Slussen. Här var det observationen att den plats människor helst uppehöll sig vid nere på Plattan var zonen där det övre planet i en båge skår över det nedre som bidrog till insikten att denna zon är mycket viktig för människors vistelse på Plattan. Här kan man stanna upp vid en pelare, ha utmärkt överblick över de många människor som rör sig över torget och vid solsken få skugga och vid regn skydd, allt på det för Segels Torg så karakteristiska sätt där sådana kvaliteter inte är direkt uppenbara.
Fig 7. Observation av var människor befinner sig som vistas på Sergels Torg (vita prickar) och graden av överblickbarhet (regnbågskala). Observera den tydliga segmentbåge som människorna beskriver längs takets kant.


News from nowhere