Physical planning for economic growth -

a study of urban areas

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0 Abstract

The growth of smaller and the establishment of new enterprises are pointed out as key questions to develop new jobs. Enterprises rely on the built environment in two ways: it contains the potential market for buying and selling, which put public, or continuous, space in focus; it contains other businesses with potential as suppliers, co-operators and customers, which put private, or discontinuous, space in focus. In analysing private space we have by an understanding of the city through a paradigm of acts come to see the plot or the property as the important spatial unit. To describe the frequency of plots in an area we use the measurement capacity. By combining the variables integration and capacity it is possible to discern four urban types: — urban, pseudo-urban, sub-urban and non-urban — with different spatial properties appropriate to different kinds of businesses. In a study in Stockholm our preliminary conclusions say that there is a correlation between capacity and the amount of workplaces and that the four urban types appear to be a useful model for further studies of the relation between space and economic life.
1 Introduction

1.1 General Background
There is a bias within modern tradition to look upon the city as a place to dwell. This has of course a lot to do with the social needs for better housing that since the beginning has been a major topic in the history of modern architecture. However it is our belief that this presupposes a specific conceptual understanding of the city that might debar us from fundamental knowledge. Working within the tradition of Work Space Design it comes natural to have a somewhat different perspective, where the city primarily is a place for work. We feel that it is rewarding to put these perspectives in contrast, since such a procedure puts many central questions concerning our cities in their most crucial form. While a city for dwelling, for example makes us look for strong meaning, stable conditions and specificity – that is reproductive qualities, as the term is used within Space Syntax tradition (Hillier, Hanson, 1984: 20) – a city for work makes us look for good function, possibilities for change and generality – that is productive qualities.

It is further quite obvious how the emphasis on dwelling has implied certain priorities in the practice of urban planning and design since World War II. While these priorities — or maybe we should call them preconceptions — have shown to be quite problematic even within the area of housing, as for example with the housing estate (Hillier, 1996: pp. 175-79), our experience tells us that such preconceptions are even more problematic when it comes to working life. While these preconceptions when it comes to housing might cause social malaise (Hillier, 1996: 183-214), bad as it is, we believe that they in the field of work might cause economic stagnation.

1.2 Background to this paper
If we shall be able to plan in an adequate way for working life in the future, it is quite clear to us that a presupposition will be a better understanding of the spatial logic of our cities. We are also convinced of the central role of syntactic theory in such a development. In our studies in this direction we have focused on two spatial interfaces of great importance. One is the spatial relation between different kinds of businesses and their customers, the other being the spatial relation in between businesses themselves. It is quite obvious though that for many enterprises both of these relations are aspatial. But it is also obvious that there are many other businesses for which it is absolutely essential to have a very specific spatial relation to customers, or which need a very precise mixture of businesses in their neighbourhood for support in different ways; businesses which therefore rely heavily on their spatial location.

What this tells us is that the city needs to provide a wide range of spatial situations, from the rather isolated situation for the more or less self-supportive company, to the very specifically mixed situation for the spatially dependent enterprise. Now, what we believe and what our preliminary studies seem to show, is that as the planning of working areas to a growing extent become part of general urban planning, that is as they become part of architectural practice, certain spatial situations are ceasing to be produced (Marcus, Steen, et al, 1997: passim). It seems to us that there is an inherent preference in architectural practice for solutions with
reproductive qualities — or at least that it has been so for large parts of this century — which might be relevant in the area of housing but which often, we are not saying always, are deeply problematic when it comes to working areas.

Above we described these reproductive spatial qualities in very general terms as being for example strong meaning, stable conditions and specificity. These are all qualities that for example might apply well to many large and independent companies, companies that make long-time investments and have developed company policies. Our concern though is directed towards another kind of enterprise, that of the smaller and newly started firm, the firm with a future difficult to plan and with small means for investments. These businesses also come to focus because they in many political proclamations are said to be the companies of the future, which will save us from our situation of high unemployment that has developed throughout large parts of the world. Whatever the truth is in these prophecies, what we know is that most companies have started out from humble beginnings. For businesses in this early phase of development the reproductive qualities described above in many cases are quite devastating, since this normally implies high rents, resistance to change and a low degree of innovative input. It is here we see the big difficulties with a situation where the city as a whole is becoming the subject of architectural care with a bias towards the reproductive.

1.3 Object of this paper

In this paper we want to do two things. First present some of the theoretical preliminaries that we have found necessary to be able to study the two interfaces mentioned above. Secondly present some empirical studies in this direction, using the syntactic method of the axial map. The later studies are currently worked on, so we are only able to present them in a preliminary form.

As for the theoretical discussion we have identified a rather obvious difference in the two interfaces of our interest. The spatial relation between businesses and customers obviously has to do with the function of movement, the movement of potential customers and the variations of the intensity of such movement in relation to the location of businesses. But when it comes to the spatial relation in between businesses, it is a relation that rather has to do with the function of occupation, and occupation on a long term. This has led us to a rather extensive theoretical discussion where the plot, understood as a space for the act of building, has emerged as a primary space for occupation in the city. Such a view we have gathered from an understanding of the city through a paradigm of acts, rather than the traditional paradigm of things (Ramírez, 1995: passim). This does not in our mind change the possibility to use syntactic method in our analysis; it is just a way of clarifying how to apply it for our specific purposes.

For the empirical studies we are working with a large area in central Stockholm called Södermalm, where we in different ways correlate our syntactic values with the whole population of workplaces with at least one employee. The object being twofold. First to identify what the spatial preferences are for different types of businesses. Secondly to identify and to develop ways to describe urban types relevant to different kinds of work places.
In this we believe that our ideas about the plot are productive. For one thing it gives us the opportunity to work with two kinds of space, one being space for movement, that is generally speaking the streets, the other being space for occupation, that is the plots. If integration has shown to be a most rewarding way of describing space for movement, we are here trying to develop a way of also describing space for occupation. We do so by a measurement we call capacity that simply tells how many plots that are possible to reach directly from each space of movement. We will return to the theoretical background for this measurement.

2 The case of Södermalm

2.1 Introductory spatial analysis of Södermalm
For our empirical studies we chose Södermalm because it is varied both when it comes to its spatial structure, as well as when it comes to the use of space, since there are not very strong land-use regulations. This makes it possible for businesses to rather freely choose from a wide range of spatial locations.

1. Södermalm, global integration

First of all though, it needs to be said that Stockholm is a quite hilly city with a lot of water, which makes it reasonable to speak of it as a series of islands, both in the sense of land surrounded by water and in the sense of hills surrounded by lower land. Secondly, when it comes to the actual urban fabric, it should be pointed out
that Stockholm has a long tradition of strong spatial regulations. This makes Stockholm far from an organic city, but rather a city made up by strong individual parts with their own spatial identities. This makes Stockholm at first hand seem to be a somewhat problematic city for a syntactic analysis.

These concerns seemed to show themselves true when we made some preliminary investigations of the area. The axial map of Södermalm (Pict. 1) has a quite low correlation between global integration and connectivity, that is a low degree of intelligibility (Hillier, 1996: pp. 124-32). It also seemed to be true when we made some preliminary observations of moving people, where the correlation between these and the integration-values, whether local or global, did not reach over a correlation-value of 0.6 (Pict. 2). When we analysed the results in detail though, looking at different areas one by one rather than taking it all in one, we found many cases of very good correlations.

2. Correlation: global integration and pedestrians.

For the focus of our concern, the spatial preferences of work places, our study has been more extensive and we have worked with the whole population of work places situated on Södermalm with at least one employee. That is to say that what is in our interest is not the amount of people at work, but the amount of economic actors, that we can find in different locations. If we correlate these amounts with the integration values of Södermalm, there was not much of a pattern, which was neither to expect. Of more interest was to correlate our new measurement of capacity to that of work places. For clarity we need to say that the capacity-value is a value calculated for each axial line in a regular axial map simply by counting the amount of plots it borders to. When this value was correlated with that of the amount of work places that was found within the very same plots, we did get a rather strong correlation with a R2-value of 0.66 (Pict. 3). Now this was for the whole population; when looked upon in more detail, taking smaller areas one by one, the correlation in many cases rose far over 0.8.

So it seemed that this was a measurement that could capture long-term occupation in an area. On second thought this was maybe not so surprising, since a line that borders to many plots usually also is a long line. What we had captured was perhaps only the fact that there, for obvious reasons, are more work places along long streets than along short ones. Correlating the metric length for the lines in question with the work places, showed this to be true (Pict. 4). Still the correlation value was a little better for capacity (R2-value: 0.66) than for length (R2-value: 0.62). What we especially thought to be of interest though, was that a
measurement of space without metric scale, that is a topological measurement, could capture a functional outcome related to occupation, saying the more plots the more occupants.

3. Correlation: line capacity and work places. 4. Correlation: line length and work places.

2.2 The real estate company as an actor

However there might be some questions, relating to the fact that we have a fairly new type of occupant in the city, that is the real estate company. If we earlier had a situation where the commissioner of a building was someone involved in some business such as for example printing or manufacturing, the commissioner today most of the time is a real estate company, which is in the business of buildings themselves. Such companies seem to contradict a strong relation between the amount of plots and the amount of work places, since it is obvious that such a company, as a primary occupant, might let to many as well as few secondary occupants.

Now, the above study seems to show that such a relation is still valid. Earlier studies of ours might give an explanation (Steen, 1998: passim). First of all it is important to see that the primary occupants in an area with low capacity, still are very few, which has direct implications on the spatial qualities of an area, as well as it has major implications on how an area might change over time. But some of our studies also show that there is an inner logic to the actions of real estate companies that work against the potential differentiality of large plots. We call this the strategies of upgrading — in order to raise rent — and upscaling — in order to lower costs by gaining advantages of large scale. We can see then how these strategies lead to homogenisation, opposing the potential diversity within single plots.

2.3 A spatial analysis of Södermalm encompassing its spatial capacity

We further realized how it would be rather easy to encompass the measurement of capacity in a regular axial map. It would all come down to an addition to such a map of a line connecting each and every plot to its neighbouring line, or lines, of movement. This would of course change the integration-values for the area, but maybe for the better we thought.

In Space is the machine there is a passage discussing the change of the integration-values for corridors depending on how many cell-offices that are connected to them (Hillier, 1996: pp. 321-23). This seemed to be a situation close to ours. After all, the city can be understood as a system of corridors, the streets, and connected cell-offices, the plots. When creating such an axial map with lines connecting the plots to the lines
of movement for Södermalm (Pict. 5), we saw that the integration-values, even though they had changed, correlated to pedestrian movement just about as well as the former integration-values (R2-value: 0.58) (Pict. 6). So even though this axial map did not seem to predict movement better than the other one, it neither seemed to predict it worse.

5. Södermalm, global integration with lines for plots.

What we had gained with the axial map encompassing the plots, was that its connectivity-value measured something that was close to what we called capacity, the difference being that it not only counted the amount of plots, but also the amount of crossing lines of movement. This turned out to be an advantage since when correlated with the amount of work places, its correlation-value showed to be even better than that for our straight capacity-value (R2-value: 0.68) (Pict. 7). So with the axial map encompassing the plots we had a map that still had a strong correlation to movement, while also adding a strong correlation to the amount of work places, which could be said to be a correlation to occupation of a certain kind.

2.4 Conclusions concerning the case of Södermalm

Now, by combining the two measurements of integration and capacity, we could produce a diagram where we possibly could discern clusters relating to these spatial measurements (Pict. 8). The important thing here is of course that these are measurements with strong relations to functional outcome. As far as integration goes, its relation to movement is well established. Our measurement of capacity on the other hand, is rather uncertain and obviously needs further studies. At this stage though, it is still our belief that there is a relation between the capacity in an area and the amount of work places, which is the same as saying that there is a relation to the amount of actors in an area. This could in general terms further be said to be a measurement of the homogeneity in an area, where a low capacity would tend to a homogenous occupational mix, that is few actors or work places, while a high capacity has the potential of a heterogeneous outcome. The point being that we then would have a measurement relevant for the study of the spatial relation inbetween businesses, and not only the relation between businesses and customers, since it is a description of occupation in an area.


Even though our diagram did not show clear clusters, which could be identified as obvious types, we distinguished four ideal types and gave them preliminary names and properties related to the two interfaces of our interest.

- First we have spatial situations with high integration and high capacity. These are simply named **urban** and we believe them to have a functional outcome that tends towards high movement flows of
potential customers, and heterogeneity when it comes to neighbouring businesses. This in our opinion is the spatial type we generally refer to when thinking of traditional cities.

- Secondly there is the opposite spatial situation, with low integration as well as capacity. This one we named *non-urban*, and we believe it to have a potential for low flows of customers, and a homogenous neighbourhood content. This type has in our opinion very little to do with cities in a traditional sense.

- Third there is the type with high integration and low capacity that we call *pseudo-urban*. This is a type we find most interesting since it has the potential of high customer flows at the same time as it presents a homogenous content; this captures to us many of our contemporary additions to the traditional city.

- Finally we have a type with low integration but high capacity, which we call *sub-urban*, that accordingly has a potential for low movement flows, but a heterogeneous occupational content. This is something we find in many suburban situations, if land-use regulations do not prevent such a heterogeneous content to develop.

![Image](scattergram.jpg)


When these types were identified in the actual map of *Södermalm*, they seemed very well to fit with our ideas of the different areas, except maybe for the sub-urban type (Pict. 9). Now, one thing that one can detect from this is that the type we call urban, has not at all been produced during this century, while the non-urban is quite common and the pseudo-urban is typical for recent years. To us this is a sign of how certain urban types, vital for large parts of our working life, seem to have ceased to be produced.

3 Theoretical background to the concept of capacity

3.1 The city of acts

We started out this paper stating the difference between an understanding of the city as a place to dwell and a place to work. On a deeper level however, we believe this not only to be a different perspective, but a
difference that rather is of a paradigmatic kind. In modern tradition we tend to understand the city as a physical phenomenon that is as a built object, which has certain physical and spatial properties. We can call this the paradigm of things, which can be said to be the established paradigm within general scientific thought. Without any ambition to challenge this fundamentally robust paradigm, we suggest that it can be productive to also look upon the city through a different paradigm, where it is not regarded as a physical phenomenon, but a phenomenon of human action, that is through a paradigm of acts (Ramirez: 1995 passim).

To understand the world through a paradigm of acts turns many familiar ideas upside down, but it also helps us to discover many preconceptions that we have. If we take such familiar things as tables and chairs, we have an immediate understanding of what they are and how to use them. We look upon them as if meaning was inherent in them. Now through human action it is possible to show how this is not necessarily true. If we simply sit down on a table, it seems quite reasonable to look upon it as a chair and if we sit down on the floor, it is more convenient to use a chair as table than a table in itself. We could say that we are ‘chairing’ the table and ‘tableing’ the chair, thereby giving meaning to things through action, instead of thinking of meaning as inherent in the things themselves.

What this tells us is how important it is to keep the fundamental difference between things and actions in mind, so that we do not start to take relations between them for granted. When it comes down to buildings and the use of their different spaces for example, such preconceptions can cause a lot of trouble. We believe that many of the problems in resolving the relation between form and function has to do with such preconceptions. When Bill Hillier resolves this relation, it is of no little importance that he does so by the help of an extra-terrestrial, that is someone who lacks all of our preconceptions (Hillier, 1996: 316).

3.2 The plot as a spatial unit
Another way of expressing this bias towards things rather than acts, is to say that there is a bias towards the result of acts rather than the acts themselves (Ramirez, 1995: passim). Hillier points to this difference when discussing the difference between architecture as a thing and an activity (Hillier, 1996: pp. 17-20). In a somewhat different way we now want to ask, is the city a thing or an activity? We know that we can understand it as a thing that is as a series of buildings, but what if we focus the act of building instead of its product?

We believe that this is a view that captures something fundamental, that is rather obvious from the perspective of working life. What is of importance in that sphere is not so much buildings in themselves, as the act of building as an intrinsic part of running a business. Put differently, in the sphere of working life it is quite obvious that buildings are means rather than ends, in a way that they are not when it comes to dwellings. That is not to say that dwellings are not means for something else, it is saying that the means and the ends are easier to confuse when it comes to dwellings, which once again has to do with the reproductive quality of dwellings. In working life changes are common and rapid, and in these it is absolutely necessary for buildings as means to change to accommodate new ends. In the area of dwellings changes are most of the
time neither common nor rapid, which make buildings closer to ends in themselves. This also makes it clear how the perspective of dwelling favours things and the perspective of work favours actions.

To widen the perspective some, we can see how it in the vernacular often is not a strong difference between buildings and other spatial manifestations. What is stressed when it comes to medieval building regulations in Sweden for example is the occupation of land in general, turning the erection of buildings into just one of many spatial manifestations that are necessary to regulate. This does in no way deny that there was a strong spatial order; it just puts buildings side by side with other spatial manifestations such as fencing, ditching and cultivation of the land in general. What emerges, as the more fundamental and stable spatial unit is the plot or the property. Within the plot the spatial manifestations changed over time according to the general needs of occupation, the plot itself though, remained a strong and permanent spatial unit.

3.3 A spatial order preceding buildings

The plot as a spatial unit that delimits spatial manifestations of different kinds seems to us to be most interesting in the perspective of the difference between things and acts. Normally we think of buildings as spatial things that accommodate different kinds of action, such as dwelling and work. Accordingly the plot seems to be a spatial ‘thing’ that houses the very act of building! What we have is a spatial order that precedes the act of building and which gives order to that activity. This seems to show us a way to spatially distinguish the act of building instead of the buildings themselves.

If we return to the city, the ordering of building activities of different kinds is exactly what the planning of cities used to be all about. To regulate the use of space in the city into different plots, where the different acts of building could take place. Inside a plot there could be one building, or many buildings, or no buildings, and this could furthermore vary over time; this was not a problem. What was important was to keep the different building activities within the limits of different plots. Basically this is still so, even though it has become more unclear because of our inclination to focus things rather than acts. What building regulations in cities dictate is not buildings in space but the use of space, where to build is only one use among many; or rather, it is an intrinsic part of the use of space.

3.4 The continuous and discontinuous spaces of cities

One most productive distinction accomplished within the tradition of syntactic theory, is that of generic function. In distinguishing the generic functions of occupation and movement, Hillier is able to establish a strong relation between built form and function (Hillier, 1996: pp. 313-27). He furthers this by showing how different configurational forms can order the functional outcome of movement. In doing so, what is analysed is the continuous space of streets and squares in our cities or what we usually call public space. This has of course to do with the intrinsic property of this space, being continuous, and its thereby strong relation to the demands of the function of movement. Still this leaves large parts of urban space unanalysed that is the discontinuous space of plots and properties, which we as a parallel can call private space. Now, there seems to us to be just as strong a relation between the intrinsic properties of private space, in being discontinuous,
and the function of occupation. The two spaces, streets and plots, come close to the two extremes, when the types of space available to meet the requirements of generic function are discerned in *Space is the machine* (Hillier, 1996: pp. 318-20).

The problem here seems to be that if we understand the city through a paradigm of things, private space dissolves into a myriad of spaces within buildings, which furthermore are in the state of constant change. This deters us from venturing into such studies. But if we understand the city through a paradigm of acts, what comes into focus are the spaces that give order to the acts of building, that is the plots. This on the other hand gives us quite an intelligible picture of private space in our cities. It also helps us to see how our cities consist of two fundamentally different types of space, both with a strong relation to function. On the one hand continuous space, which is primarily related to the generic function of movement and on the other hand discontinuous space, primarily related to the generic function of occupation.

### 3.5 Conclusions concerning the theoretical background to the concept of capacity

We think that focusing the act of building instead of the buildings themselves in this way, not only can help us to find spatial order in the private space of cities, but also help us to a better understanding of the generic function of occupation. We believe it in many cases to be productive and relevant, to understand occupation as the act of building. In a wider interpretation of the word ‘build’ – as in the one we found in Swedish medieval law, where the act of building could signify a wide range of spatial manifestations – we can say that ‘to build’ is what we do, not only when we erect new buildings, but also when we rebuild them or add to them, as well as when we make small alterations, or even just rearrange the furniture within them. All these are spatial manifestations related to different specific occupational needs, which all can be called ‘to build’. This also implies how buildings seldom are the kind of static entities we tend to take them for, but rather are ongoing spatial processes. It is in this way we think it to be rewarding to say that all occupational functions imply the act of building in one way or another, and that it is this aspect of the different occupational functions that we believe is relevant when it comes to many spatial analyses of occupation.

Finally it is quite obvious how the amount of plots in an area, or related to a space for movement, can be called the capacity for such an area or space; the capacity for different acts of building, or if we prefer, the capacity for actors. Such actors can further be identified as primary occupants that, even though there might be many secondary occupants, in the long run are the important factors when it comes to the character of the occupational content in an area. A high capacity then seems to have a relation to the potentiality of a heterogeneous content, while a low to a homogenous, which is a most important distinction when it comes to the spatial preferences of businesses. Further studies in this direction are currently under hand in a thesis work hopefully completed within this year (Marcus, L. 1998: passim).
Bibliography


