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Larsson, Stefan; Åström, Karsten

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PO Box 117  
221 00 Lund  
+46 46-222 00 00



## **SPATIAL PLANNING AND SOCIOLOGY OF LAW: Sustainable development issues in constructing infrastructure for the third generation mobile telephone system in Sweden.**

**Draft paper** by Stefan Larsson, LL.M, MSoSc, Ph D student  
and Karsten Åström, Ph D, Professor in Sociology of Law  
Lund University  
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Abstract

The infrastructure for the third generation of mobile telephony, UMTS, is under construction in Sweden. Within three years four operators were to build competing systems to cover 99,98 % of the population.

The case of the 3G infrastructure illustrates how sustainability issues are handled in planning and environmental management, with conflicting goals between institutional levels and contradictory legislation. At the national level economic and technological optimism and regional policy is in conflict with environmental and sustainability goals. No comprehensive assessment was made of the entire system; the infrastructure is assessed through one permit for each mast, at the local level, giving the administrative system an extreme challenge, and giving unexpected environmental and social outcomes as a result from the lack of comprehensive assessment.

Based on surveys of all local planning authorities, a regional sample of permit processes and examination of legal cases the paper examines the outcomes of the fragmented assessment of the local permit process level, from a sustainability perspective. What are the emerging effects and conflicts? The role of law in central planning with local outcomes in the case of regulating and controlling spatial planning in the case of 3G, will be analysed in this paper.

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## PART ONE

### 1.0 Introducing the paper: three levels of thought

The long title of the paper holds three main elements or levels of thought beginning with the a) *theoretical agenda* of Spatial Planning and Sociology of Law, suggesting an interdisciplinary approach on planning issues, followed by what here is referred to as b) *the problem*, meaning the sustainable development issues, all of which addressed to the empirical basis of c) *the case*, the construction of the third generation mobile telephone system, the 3G, in Sweden. In the latter, the empirical base of the study is formed out of surveys of all local planning authorities, a regional sample (the Blekinge County) of permit processes and examination of legal cases telling the outcomes of the fragmented assessment of the local permit process level, from a sustainable development perspective, with its emerging effects and conflicts. This data is used to both depict the implementation story of the infrastructure construction as well as to analyze the legal provisions forming or controlling for the actors in the case, and the design of the processes. This legal design is criticized from certain aspects related to sustainable development and concluded from planning theory aspects as well as from a Sociology of Law point of view.

In conclusion, this means that the construction of 3G infrastructure in Sweden holds many questions closely related to sustainable development issues, being such a spatially located activity, with clear planning aspects. Both the planning of this case, and the implementation of it, is however depending on the legal framework, both to its prerequisites and its outcomes. The important legal framework for the environmental management and planning in Sweden is formed by the Environmental Code (1998:808), EC, and the Planning and Building Act (1987:10), PBA - two sets of regulation that holds complexities between them, elaborated below from an empirical base. The interplay of the law and the planning and implementation of the technological infrastructure is addressed in this paper. Which all fall under the broad umbrella of governing technology, although with a particular specification of Spatial Planning. The paper is based on the findings of an ongoing study within the MiSt programme to be presented in Stefan Larsson's licentiate thesis in Spatial Planning at the Blekinge Institute of Technology late 2007.<sup>1</sup>

### 2.0 Depicting the problem: Sustainable development issues

The case of the 3G infrastructure illustrates how sustainability issues are handled in planning and environmental management, with conflicting goals between institutional levels and contradictory legislation. No comprehensive assessment was made of the entire system; the infrastructure is assessed through the permit process of each and every mast, at the local level, giving the administrative system an extreme challenge, and giving unexpected environmental and social outcomes as a result from the lack of comprehensive assessment. The base stations

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<sup>1</sup> MiSt is an interdisciplinary research programme on tools for environmental assessment in strategic decision making funded by the Swedish Environmental Protection Agency. The programme is co-ordinated from the Spatial Planning Programme of Blekinge Institute of Technology. See [http://www.bth.se/ths/mist\\_eng.nsf](http://www.bth.se/ths/mist_eng.nsf)  
The working title of the thesis is *Infrastructure for the third generation mobile telephone system as a sustainability issue in planning and environmental administration in Sweden.*



that do not require a mast, being put up in buildings, on facades or rooftops, do not need a building permit either, and hence no assessment is being done at all for these. Since one eagerly discussed issue of the infrastructure construction has been the electromagnetic radiation and fear for that this radiation should be dangerous in some way, the fact that only the mast needing base stations are assessed raises the question how this fear is being dealt with legally.

Based on surveys of all local planning authorities, a regional sample of permit processes and examination of legal cases and documents the paper examines the outcomes of the fragmented assessment of the local permit process level, from a sustainable development perspective. The role of law in central planning with local outcomes in the case of regulating and controlling spatial planning in the case of 3G, is analysed in this paper.

### 2.1 *Research questions of the paper*

- 1 What characterises the legal design used for the 3G infrastructure development? Which are the deficiencies? Can inconsistencies be seen? Can the decision making of the environmental and spatial management in Sweden be divided into two paradigms?
- 2 What are the outcomes of the fragmented assessment of the local permit process level, from a sustainable development perspective?
- 3 How is the electromagnetic radiation and public fear for it handled in the construction?

These research questions will to a great extent be view through two “paradigms” of environmental management and spatial planning presented below, following on a post war history of planning theory.

### 3.0 **Introducing the case: Infrastructure for 3G in Sweden**

Sustainable development is a main goal for the politics of the Swedish government.<sup>2</sup> The infrastructure for the third generation of mobile telephony is since the year of 2000 under construction in Sweden. After the initial allocation of spectrum by proposed criteria in a selection process, the so called beauty contest, four operators were given licenses to build the infrastructure for 3G. Within three years the four operators were to build competing systems to cover 99,98 % of the population giving the administrative system an extreme challenge. The licence conditions stated that each operator had to have 30 % of own infrastructure and up to 70 % collaborative, of the coverage. An estimation conducted for the national Swedish Post and Telecommunications Agency, PTS, stated that a reasonable area coverage would be around 170 000 km<sup>2</sup>, about 41 % of the total Swedish surface area.<sup>3</sup> Parts of the licence conditions, such as the 70 % collaborative infrastructure condition, is following set values that were decided before the so called beauty contest, and some conditions emanates from the contest itself, such as the degree of coverage and the roll-out speed.

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<sup>2</sup> Regeringens skrivelse 2005/06:126, p 1.

<sup>3</sup> Björkdahl & Bohlin (2003) *3G Network Investments in Sweden*, PTS-ER-2003:9, by IMIT & Chalmers conducted for the PTS.

The coverage by the end of the period was however lacking by between 34% and 26% compared to the licence conditions (which stated a coverage of 99,98 % of populated areas), with only three operators still participating in the construction. On 1 December 2006, three years later, Telia Sonera and Tele2 (SULAB) reported to the Post and Tele Agency that their common net had reached the coverage of 8.860.000 inhabitants of Sweden, which was required to fulfil the licence terms. The coverage, by this operator was reached three years too late, and the other operators had still to fulfill the coverage of the licence conditions.<sup>4</sup>

The 3G infrastructure in Sweden has been studied from an environmental planning perspective by Emmelin and Söderblom, and Larsson, within a on-going project in the MiSt research programme.<sup>5</sup> The case of the construction of the third generation of mobile telecommunications system is chosen because it offers a unique possibility for studying how the planning and environment protection administrations at local and regional level in practice handle a sustainable development issue; on the one hand a national technological growth system and on the other environment protection, resource use, public concern over radiation etc. The permit process within the municipalities holds many of the keys regarding planning administration and the implementation of the decision of the 3G infrastructure construction in relation to legal provisions.

The third generation of mobile systems, UMTS, uses radio frequencies around 2000 MHz. The frequency used has implications on how far the information can travel and how much information the signal can contain. The UMTS use a higher frequency than the GSM system, and can therefore contain larger amounts of information, but will on the other hand require more base stations since the signals travel a shorter distance.<sup>6</sup> The higher the frequency, the shorter the distance and ability to penetrate material. This, naturally, requires more base stations for the same coverage.

NMT – around 450 MHz  
GSM – between 900 and 1800 MHz  
3G – around 2,1 GHz

The net consists of *cells*. The cell is the basic geographic unit of a cellular communications system. Service coverage of a given area is based on a network of cells, each with a radio base station (transmitters/receivers) at its centre. The size of each cell is determined by the terrain, the antenna height and power. According to estimates a site in an urban area covers approximately 3.5 km<sup>2</sup> and a site in a rural area covers approximately 29 km<sup>2</sup>.<sup>7</sup>

The base station is the radio equipment located at the centre of each cell in a cellular telephone network. The base station communicates with all the active mobile telephones in the cell and provides them with a connection to the switched telephone network.

<sup>4</sup> <http://www.pts.se/Nyheter/nyhet.asp?Itemid=6243> The differences between the licence conditions and the actual outcome of the development has been further analyzed in Larsson, Stefan & Emmelin, Lars (2007) *Sustainable development in practice: infrastructure for the third generation mobile telephone system in Sweden*, published in the conference proceedings of IAIA07 conference in Seoul, Korea, 4-9 June 2007.

<sup>5</sup> Emmelin, Lars & Söderblom, Ingmarie (research report no 2002:07) *Spelet om 3G – en förstudie av masfrågan*, Blekinge Institute of Technology and Larsson, Stefan (2006) *3G of Sweden – Technological growth and sustainability issues*, article in Emmelin, L. (2006) [ed.] *Effective Environmental Assessment Tools - critical reflections on concepts and practice*. [Blekinge Institute of Technology Research Report 2006:3].

<sup>6</sup> [http://www.ssi.se/ickejoniserande\\_stralning/Mobiltele/Mobiltele.html?Menu2=Mobiltelefoni](http://www.ssi.se/ickejoniserande_stralning/Mobiltele/Mobiltele.html?Menu2=Mobiltelefoni)

<sup>7</sup> Björkdahl & Bohlin (2003) *3G Network Investments in Sweden*, PTS-ER-2003:9, p 7.

A phone call to a mobile phone is transferred through cables or radio link and switchboard on the same way as other phone calls to a co called base station. From the base station to the mobile phone the information is transmitted through radio signals. In the base station there are one or more transmitters and receivers that are connected to one or more antennas. These antennas can be mounted on a mast or for instance on a roof or a façade of a building.

The licence conditions are to some extent derived from the fact that the licences were allocated through a beauty contest and not, which was common throughout Europe, through auctioning and given to the highest bidders.

### 3.1 *The beauty contest*

The beauty contest as a method for selecting 3G licence holders in Sweden has been discussed by Emmelin & Söderblom from a spatial planning perspective and investigated in an economic context by Andersson, Hultén and Valiente.<sup>8</sup> A beauty contest consists of allocation of spectrum by governmental agencies that propose criteria to be followed in the selection process. The lack of transparency of this way of allocating licences has been criticized.<sup>9</sup> On 12<sup>th</sup> May 2000, the Post and Telecommunications Agency issued an invitation to all parties wanting to provide network capacity for the third generation of mobile telecommunications system in Sweden.<sup>10</sup> Four licences were to be issued, valid until 31 December 2015. The selection was divided into two steps where the contestants were reviewed using certain criteria.

The initial evaluation of the contestants was made to review if the operators had fulfilled the preconditions for the establishment of a 3G network. This included financial capacity, technical as well as commercial feasibility, and appropriate expertise and experience.<sup>11</sup> If a contestant passed this initial consideration the second stage of the evaluation regarded coverage in relation to surface area and population, and the roll-out speed for the networks.<sup>12</sup>

PTS decided that Europolitan (later Vodafone, now Telenor), HI3G (3), Orange and Tele2 should each get a licence. All four undertook to cover at least 8 860 000 people by the end of 2003. These licences apply up to and including 31 December 2015. Telia, Telenordia and Reach Out Mobile, which did not get any 3G licences, appealed the PTS decision to the County Administrative Court. The County Administrative Court confirmed the PTS decision on 27 June 2001, without further appeal. The fact that Telia did not get a licence surprised many, but Telia became a part of the construction via a collaboration with Tele2, who did get a licence.

Sweden could not avoid constructing the infrastructure for 3G, being an EU member, but how fast and the degree of coverage could to a large extent be decided in each country. The beauty contest took place in a time when the belief in the 3G technology as well as the commercial

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<sup>8</sup> Emmelin & Söderblom (2002). Andersson, Per, Hulthén, Staffan & Valiente, Pablo (2005) Telecommunications Policy 29, pp 577-593, *Beauty contest licensing lessons from the 3G process in Sweden*, Stockholm School of Economics, Sweden..

<sup>9</sup> Andersson, Hulthén & Valiente (2005), p 579.

<sup>10</sup> PTS (12 May 2000).

<sup>11</sup> See PTS (12 May 2000), p 8-9 and Andersson, Hulthén & Valiente (2005), p 583.

<sup>12</sup> See PTS (12 May 2000), p 9 and Andersson, Hulthén & Valiente (2005), p 583.

viability of the technology was strong. The design of the beauty contest rendered the long going promises of the operators to complete an infrastructure with a full coverage of the populated areas of Sweden as soon as within three years. Since the belief in the technology was strong the operators promising a less coverage or to a lower roll-out speed would not have received a licence.

### 3.2 *The licence conditions*

Within three years the four operators were to build competing systems to cover 99,98 % of the population giving the administrative system an extreme challenge. An estimation conducted for the PTS stated that a reasonable area coverage would be around 170 000 km<sup>2</sup>, about 41 % of the total Swedish surface area.<sup>13</sup> The licence conditions stated that each operator had to have 30 % of own infrastructure and up to 70 % collaborative, of the coverage. Parts of the licence conditions, such as the latter, is following set values that was decided before the so called beauty contest, and some conditions emanates from the contest itself, such as the degree of coverage and the roll-out speed.

### 3.3 *From a sustainable development perspective*

The case of the 3G infrastructure illustrates how sustainability issues are handled in planning and environmental management, with conflicting goals between institutional levels and contradictory legislation. At the national level economic and technological optimism and regional policy is in conflict with environmental and sustainability goals. No comprehensive assessment was made of the entire system; the infrastructure is assessed through one permit for each mast, at the local level, giving the administrative system an extreme challenge, and giving unexpected environmental and social outcomes as a result from the lack of comprehensive assessment.

When setting up the conditions for the construction of four separate infrastructures for a telecommunications systems with a maximum of 70 % common infrastructure, but most likely much less, the emphasis is on competitive aspects, in favour to the consumer. This can be questioned from the perspective of ecological sustainability, which had a little emphasis in the initial discussion. Several thousands of extra 3G antennas were to be put up for the sake of competition between the operators. Although the existing possibility to share an antenna or telecommunications tower between operators, with the result of lower number of antennas and no lack of coverage or competition between operators, the premises for the construction was criticized for the impact on the environment.

The coverage conditions of the licences demanded coverage also in the sparsely populated areas, where the forces of the market based on profitability would not reach. In this sense, the setting of the 3G infrastructure construction much looked like a plan economic decision rhetorically defended with reasons such as that everyone shall have 3G access (whether or not they want it), regional growth (not just big city areas) and that competition amongst several operators will benefit the consumers.

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<sup>13</sup> Björkdahl & Bohlin (2003) *3G Network Investments in Sweden*, PTS-ER-2003:9, by IMIT & Chalmers conducted for the PTS.

## PART TWO

### **4.0 Introducing theory: The interface between planning theory and Sociology of Law**

The governing of technological development in a spatial environment cuts through the fields of both the socio-legal sciences as well as planning theory. To be able to assess the legal design of the 3G decision when handing out licences to operators but more importantly the environmental management and spatial planning as far as it concerns the 3G case a review of planning theory is necessary. This will give a theoretical basis combined with the perspective on norms of Sociology of Law.

#### *4.1 Spatial Planning – how to approach decision making*

The view on what ideal spatial planning is, has changed through the years, and naturally has been advocated differently by different theorists. Spatial planning is however a wide term encompassing a range of activities at different levels, from having a connection to “societal planning” (which is a even wider term), and to include a practical activity, the planner profession that is found in for instance the local authorities’ housing or construction offices.<sup>14</sup> Added to this profession is an academic discipline more or less well defined or eclectic containing theories or attitudes regarding how spatial planning is done or should be done.

That the social sciences could influence planning was realized early, but it was in the 1950’s and 1960’s the impact became clear. Economists contributed ideas about equity and public interest and about decision-making and analysis. Psychological knowledge as well as sociology and political science has influenced planning as well as architectural and aesthetic ideals. These disciplines, naturally, with their own classic thinkers influencing their discipline. This may suggest the disparate collection of influences within spatial planning. Spatial planning, it seems, is a lot, although probably not everything, to comment on Wildavsky.<sup>15</sup>

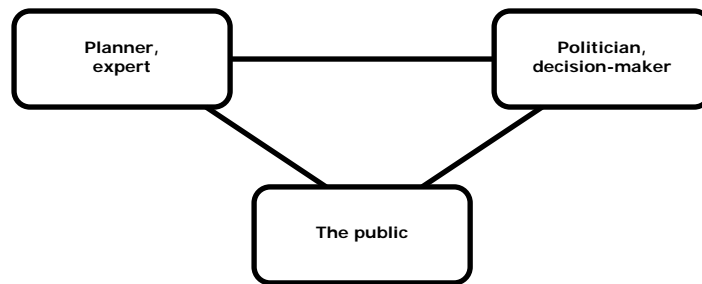
The approaches to spatial planning can be seen as a help to classify specific (empirical) decisions of a strategic character. The decision-making can be more or less legally regulated, and imply a type of approach with elements of another. It is shown that the public participation plays different roles in the approaches. The figures below are meant to show different levels of participation and a few fixed conceivable versions of the planning process, of which real processes can be more or less alike. The roles in spatial planning can generally be divided in three.

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<sup>14</sup> The term “societal planning” occurs at least in Nordic planning literature and is wider than ‘spatial planning’. See Amdam & Veggeland 1998, Henecke 2006, p 60 and discussion in Emmelin/Lerman 2006.

<sup>15</sup> See Wildavsky (1973) *If planning is everything, maybe it’s nothing*.

*The roles of public planning<sup>16</sup>*



The theories of spatial planning – the activity of presenting a possible future – focus to a great extent strategies of decision-making: What is, and how do we reach the best decision? Following the suggested view of Emmelin that is elaborated below the reader can keep in mind that the answer to this question may differ with the thinking of the two different paradigms. The shifting attitude towards this question can however be tied to a chronology as well. Early conceptions of both the 19<sup>th</sup> and the 20<sup>th</sup> century connected to planning regards utopian ideals; the idea that you can design an ideal end state. Idealistic political influences used planning as a tool for large scale societal development, at the same time as ambitious architects and planners like Le Corbusier widened the limits of architecture.<sup>17</sup>

**Development trends in planning theory**

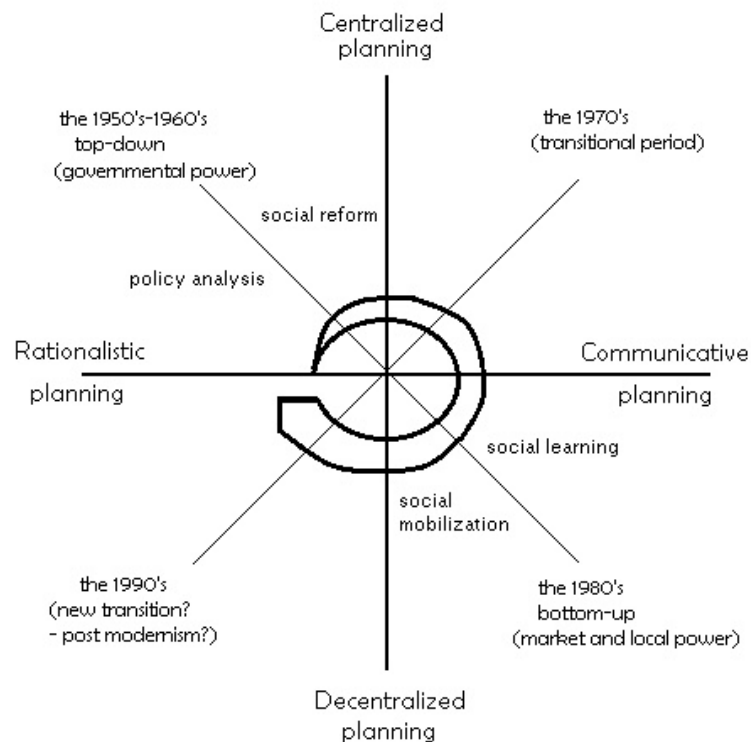


Figure: Translated from Amdam & Veggeland (1998), p 33.

<sup>16</sup> Amdam/Veggeland, p 71.

<sup>17</sup> Linn (1998) p 136 – 143.

The picture suggests a renaissance for instrumental rationalistic theories, which Amdam and Veggeland develops and exemplifies with the construction of Gardemoen Airport, although with the note that the tendencies are not as strong as in the 1950-1960's. An example of instrumental and centralistic contemporary planning can in Sweden be illustrated by the construction of 3G infrastructure which was a decision with strongly fixed variables regarding coverage and quantity of operators with partly an own physical infrastructure.<sup>18</sup>

Friedmann focuses on "Guidance" counter "Transformation".<sup>19</sup> Guidance means in this definition a top down approach, that the powerful impose changes, assume control, try to grow stronger. This is where planning is an instrument to those who have power. The changes will probably firstly suit the powerful. Transformation means a bottom up approach, where societal change is undertaken through communication at grass root level. The planning traditions offer a sliding transition between the two models.<sup>20</sup> The difference can be seen as between instrumental action based on causal thinking and communicative action based on social rationality. Social rationality in a societal context is reached through unbound communication between many participants. A polarity can be seen in the approach toward the decision making of environmental management and spatial planning, namely, a polarity that will be elaborated below of the mind-sets that may follow on two different approaches towards decision-making, here called two "paradigms". Before this view is summed up, another element will be added to this analytical instrument, which is the concept of norms of Sociology of Law.

#### 4.2 *Sociology of Law – the critical perspective on (environmental and planning) law*

Sociology of Law offers a set of perspective-giving tools in relation to law and legal institutions. Sociology of Law offers a way to question legal matters from a social scientific perspective, with social scientific method and theory. In the governance and control over the spatial environment the legal frame plays a significant role. How the legal provisions are manifested in a factual sense, showing the empirical side of law, is one of the important fields of study in Sociology of Law. The method of collecting permit process documents to find the sustainable development *in practice* is a social scientific method. The documents are legal and are corresponding to a set of rules and regulations which are analyzed along with relevant cases. The method of finding existing law is a legal dogmatic, but when questioning these findings from a socio-legal perspective the perspective of Sociology of Law is taken, which offers an analytical depth to the Spatial Planning context.

Methodologically the Sociology of Law goes backwards from the legal dogmatic method, which starts with the specific regulation and draws conclusions on what to be done from how this regulation is constructed. The Sociology of Law analysis starts with the action, the behaviour, the empirical side, and asks what the normative premises are behind that action or behaviour. This is what is suggested in the analysis of the two paradigms of land and water

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<sup>18</sup> See Larsson, Stefan (2006).

<sup>19</sup> From Friedmann (1987) *Planning in the public domain*. "Guidance" and "transformation" Amdam and Veggeland translates to Norwegian as "samfunnsstyring" and "samfunnsomdanning".

<sup>20</sup> Amdam/Veggeland, p 39.

administration below. The sociologist of law reconstructs the normative content against the background of the actual behaviour and its motives.<sup>21</sup>

In Sociology of Law the concept of ‘the norm’ can be operate as an analytical tool. “The norm” is in this context something controlling or steering action or behaviour. “A norm is a directive for action that under similar circumstances gives rise to repeated actions” as Hydén puts it.<sup>22</sup> “The norm” is in this case not understood as synonymous to a legal norm, nor a fixed standard of the natural sciences. The norms in the norm scientific sense are recognized by the spontaneous observance of the norm.<sup>23</sup> The norm is in this context understood as something governing or assigning action, the inherent entity that is expressed through the action. Some norms do equal the legal norm, many do not, and the most behavioural norms are simply not the object of legislation.<sup>24</sup> There are several examples of study of norms in this specific approach in an individual, institutional or structural sense, for instance the Baier (2003) study of the construction of a tunnel through the ridge of Halland, or the Wickenberg (1999) study of environmental awareness reaching the compulsory school.<sup>25</sup> The concept of norms can be used to explain actions and patterns of action among individuals, groups or on a more structural level. The concept of norms as a directive for human action indicate that human actions are not random or can be completely explained for instance out of a rational choice perspective.

The “norm” or when something is “normative” is in this sense not understood strictly as the legal norm, meaning the “law” or the specific legal regulation. The legal norm, the law, is in this perspective simply one of many values or reasons for action. It is also important to divide the “norm” in the norm science from the technical norms that emanate from natural scientific non negotiable laws of nature. Also, it is not to be mistaken for the specific environmental quality standard of the Environmental Code of Swedish law.

The legal system has a purpose to control action. The legal system aims however only to control certain types of actions, which generally means that the legal system is not “activated“, other than in exceptional cases. Different legal bodies can represent different norms, having emerged in different contexts with different purposes. This means that laws can be in conflict, especially when regulating areas closely related to each other. In a legal dogmatic point of view this does not have to be seen as a problem, since the legal bodies define what law that complement the other, either explicitly or following legal principles. From a social point of view, an external perspective, such as the one of Sociology of Law, this can be problematic. In the interface between law and the individuals a too complex legal system will render a less direct connection to the norms that control the actions of the individual or other actors. If a legal provision slides away from the societal norm, the purpose of law may fail.

The land use and environmental management has gathered a rather complex set of rules mainly consisting of the two most important legal corpuses, the Environmental Code and the

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<sup>21</sup> Hydén, Håkan (2002) *Rättssociologi som rättsvetenskap*, Lund: Studentlitteratur, p 35 – 36.

<sup>22</sup> Hydén 2004, *Om relationer mellan normer och regler. Kompendium i rättssociologi*, p 6.

<sup>23</sup> Hydén, Håkan (2002) *Rättssociologi som rättsvetenskap*, Lund: Studentlitteratur, p 30 ff.

<sup>24</sup> Hydén 2001, 2002

<sup>25</sup> Baier, Matthias (2003). *Norm och rättsregel. En undersökning av tunnelbygget genom Hallandsåsen*. Lund: Sociologiska institutionen, Wickenberg P (1999) *Normstödjande strukturer – miljötematiken börjar slå rot i skolan*. Lund Studies in Sociology of Law.

Planning and Building Act. On an implementation level these two legal corpuses may conflict each other. This will be shown below in the case of the 3G construction.

#### 4.3 *Two normative paradigms in the land and water administration*

Thomas Kuhn, who coined the expression of paradigms, and others following him emphasize that scientific paradigms are constructed around certain unspoken, axiomatic presuppositions and that the questioning tendencies are not welcome within these paradigms.<sup>26</sup> The Swedish system for environmental governance can roughly be said to contain two principal elements: environmental management and spatial planning with their respective sets of legislation – the Environmental Code and the Planning and Building Act – and administrations and the constituent professions and professional cultures. It is useful to analytically distinguish between two paradigms governing the respective elements. Emmelin/Lerman suggests a view of two leading paradigms behind the regulation and controlling of land use and the environment, two “philosophies of government”. The paradigms are named *Environment* and *Plan*.<sup>27</sup> With these paradigms follow a mind-set, a way of approaching and viewing the world, affecting the issues of land use and environment in different, specific ways. “Normative” is here used in a particular sense outlined above, in chapter 4.2. The view of the paradigms of Emmelin/Lerman is here added with the norm concepts outlined above, focusing the “normativity” of the paradigms.

##### 4.3.1 The environmentalist paradigm

The “*environmentalist paradigm*” springs out of the natural sciences. A decision is legitimate if it rests on sound scientific evidence. Expert knowledge and central overview is critical to “correct” decisions; indeed the notion of “correct decisions” in cases of conflicts of interest is one important figure of thought in the paradigm. Nature serves as a reference base, in the sense of such figures of thought as “natural” and “natural conditions”. These figures of thought reach into the pollution and environmental health discourses and are not confined to nature conservation. The paradigm leads to regulation taking its point of departure in nature and “natural states”. The limits to what nature can tolerate is an important concept in the Swedish environmental quality objectives. The need for sound scientific knowledge means that scientific expertise holds a key position in environmental policy. Legitimacy in the environmental paradigm is seen as stemming from scientific quality of the underlying information and the principles. The good and legitimate decision can be defined, and perhaps explained to the public, but not retrieved from it. It rests upon the best possible scientific judgement. In this view the health or status of the environment is something measurable. Which leads to a calculating rationality with expert groups representing knowledge, as opposing a communicative rationality.

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<sup>26</sup> See Hydén, Håkan (2002) *Rättsociologi som rättsvetenskap*, Lund: Studentlitteratur, p 18-19 and Thomas Brante (1980), *Vetenskapens struktur och förändring*, Lund, p 76 ff.

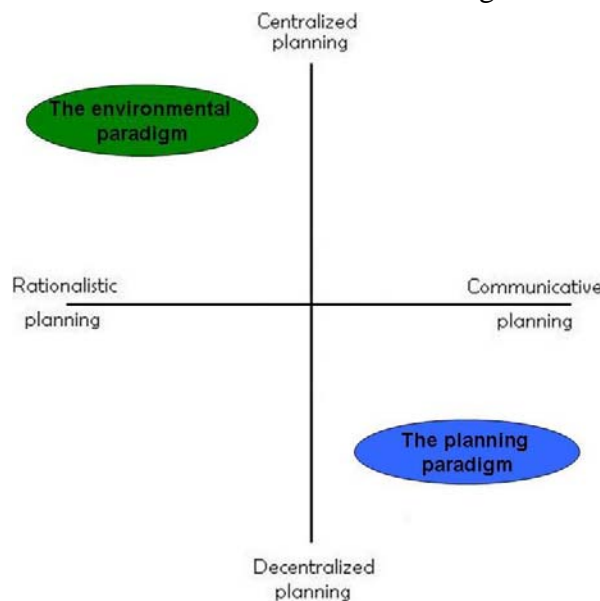
<sup>27</sup> Emmelin & Lerman 2006, p 21ff.

#### 4.3.2 The plan paradigm

The “*plan paradigm*”, on the other hand, leads to the view that the government and control of transformation of land use rests upon the balancing of legitimate but not necessarily compatible interests. A decision is good and legitimate if it is reached through a process where the interests have been heard and that the balancing rests upon the decision of a representative and democratic assembly. Whether you lean on the one or the other paradigm will result in different answers for different matters. Emmelin & Lerman give a few examples: How power should be divided between different societal organs, how expert knowledge will be balanced against local self-determination, the relation between politicians and the civil servants.<sup>28</sup> A central conflict of interest is thus the one between public and private interests in land use. Although methods may vary over a wide scale from strictly rationalist to deliberative the ultimate decisions in spatial planning are political. Their proximate legitimacy is a claim to “fairness” and their ultimate legitimacy is democratic decision making.

#### 4.3.3 Summing up with a picture

These two paradigms can be illustrated as a function of two dimensions. One is the central versus local. The other is the poles of decision rationality as between “calculating”/rationalistic and “communicative”, as used by Amdam and Veggeland above in a slightly modified way. The paradigms are basic to respectively the Environmental Code and the Planning and Building Act. According to Emmelin, many of the problems and complexities of Scandinavian planning and environmental management can be analysed in terms of the tensions between the two paradigms.<sup>29</sup> The two paradigms are also of use in understanding differences in perceptions of the role of environmental assessment and how this in turn influences implementation of directives and national legislation.



<sup>28</sup> The delicate borderline between the politician and the planner in the municipality has been studied by Isaksson and Storbjörk 2005.

<sup>29</sup> Emmelin & Lerman 2006.

## PART THREE

### **5.0 3G empirically: Inconsistencies in the system of environmental management and spatial planning in the 3G case**

It is in the empirical study of the 3G construction that the real side of the 3G decision of Sweden and the environmental and planning legislation can be seen. When focusing the outcomes, the actual conflicts and the emerging, the sustainable development is studied in its practice, and the possible legal deficiencies or systematic inconsistencies of the construction is revealed.

The permit processes for each 3G mast of the five municipalities of Blekinge are collected from the initial application of 11 Oct 2001 in Karlshamn, and updated to the autumn of 2005 and early 2006. The permit processes are all in all 248 although there are a few from the region within the time span that the collector of the documents had problems in retrieving. These building permits allow scanning for main issues and conflicts of interest for how the planning and environmental administration functions from a sustainable development perspective. A selection of the permits has been further analyzed according to the research questions. Three national PTS surveys from 2003, two quantitative, of 2 April and 4 December, and one qualitative, of 2 April, will serve as both data of the nation wide development of the construction, and as a comparative element to the detailed Blekinge data.

#### *5.1 The Environmental Code*

At regional level the ecological perspective receives a focus due to the legislated demand for the operators to a consultation with the public in addition to the local permit process for the mast. This consultation takes part in the County Administration at a regional level (ch. 12 section 6, Environmental Code) and can regard conservation of landscape, aesthetic and amenity values.

*The precautionary principle* can in Swedish environmental law be seen in the provisions for someone performing activities applicable to the Environmental Code, 2 ch. sect 3:

*Persons who pursue an activity or take a measure, or intend to do so, shall implement protective measures, comply with restrictions and take any other precautions that are necessary in order to prevent, hinder or combat damage or detriment to human health or the environment as a result of the activity or measure.*

Which is continued with:

*Such precautions shall be taken as soon as there is cause to assume that an activity or measure may cause damage or detriment to human health or the environment.*<sup>30</sup>

According to matters concerning the Environmental Code the radiation of the masts was long not considered to be within the scope of the law, since the radiation was defined as not

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<sup>30</sup> The Environmental Code, as published by the Ministry of the Environment in 2000.

hazardous to human health or to the environment. A further definition of what environmentally hazardous activity is found in chapter 9, sect 1 of the EC, and a definition of the term "*damage or detriment to human health*" is found in chap 9 sect 3.

The Environmental Court of Växjö 13 Sep 2004 ruled out the possibility of 3G antennas being regarded as an activity causing damage or detriment to the environment.<sup>31</sup> However, the Environmental Court of Appeal revoked in 12 October 2005 the decision, stating that mobile antennas are included in the definition of environmentally hazardous activities of the EC.<sup>32</sup> The Court firstly conclude that an activity that is comprised by any of the items indicated in chapter 9, s. 1 of the EC is to be characterized as environmentally hazardous, even if the activity is not hazardous to the environment. It is sufficient, regarding the actual constructions, that there is a matter of use of real property that can bring detriment to the surroundings, and it is sufficient with *a risk*.

With the risk of the radiation being hazardous, the activity of a 3G mast is included by the Environmental Codes definition of a hazardous activity. This meant in the case that the mast activities fell under the scope of what the municipality should supervise from a environmental perspective. The municipality had demanded to receive a map from the operators over where the base stations where located in the municipality, which they did, following the court decision.

## 5.2 The Planning and Building Act

In the Planning and Building Act, which control the mast permit processes, the radiation is not found to be hazardous activity, based on legal practise which refer to the Swedish Radiation Protection Authority's statements. It is stated in chapter 2, section 2 that:

*Buildings shall be placed and designed in a matter that neither the buildings themselves nor their intended use will pose any threat to the traffic safety, cause any other danger or significant impact to the surroundings.*<sup>33</sup>

The wording is in Swedish more similar to the above in 5.1 cited section of the Environmental Code than in the english translation.<sup>34</sup> Nevertheless, The sections aim in the same direction, and can, in different contexts, judge the same type of activities. And, as the case from the Environmental Court of Appeals referred to above shows, the radiation from a 3G mast has been judged to be hazardous in one legal context (the EC) and not in another (the PBA).

Of the 28 appeals of the 248 permit applications of Blekinge, 23 were related to issues of the electromagnetic radiation. The local municipality often considered the neighbours view of fear for the radiation, but the higher courts, when a mast building permit was appealed, did

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<sup>31</sup> Case no M 3411-04.

<sup>32</sup> Case nr M 7485-04.

<sup>33</sup> Legislation translated and released by the National Board of Housing, Building and Planning 2006.

<sup>34</sup> 2 Kap. 3 § st 2 MB "Dessa försiktighetsmått skall vidtas så snart det finns skäl att anta att en verksamhet eller åtgärd kan medföra skada eller *olägenhet* för människors hälsa eller miljön." Att jämföras med Kap 3, 2 § PBL "Byggnader skall placeras och utformas så att de eller deras avsedda användning inte inverkar menligt på trafiksäkerheten eller på annat sätt medför fara eller betydande *olägenheter* för omgivningen."



not. The case of a permit process of *Tararp 3:5* outside a detailed development planned area in Karlshamn was criticized by 11 neighbours on grounds that the 72 m antenna would not be aesthetically appealing, and with regards to the worry for the negative effects of the radiation. This is an exceptional case, which took 2 years, 2 months and 14 days, from the permit application of 9 Apr 2002 to the decision of the Government of 23 June 2004. The interesting result of it is however that it continued all the way through the system of appeals and that the Government found that the reasons the complainants (the neighbours) bring forward, fear for radiation among for instance, do not constitute any hindrance for a building permit. The Government referred to what is stated by the Swedish Administrative Court of Appeals in Jönköping (Kammarrätten), saying that the fear for electromagnetic radiation being hazardous is not a reason to deny a mast building permit, since the Swedish Radiation Protection Authority has stated that it is not hazardous as long as the radiation levels is below the set up standard values. The municipal building committee had however denied the permit initially, which was the action leading to the appeal.

5.3 *Concluding the legal bodies inflict on the infrastructure development*

The Environmental Code	The Planning and Building Act
<p>Base station: Can be an activity causing damage or detriment to the environment (since 12 Oct 2005) = part of the municipal supervision</p>	<p>Antennas: Aesthetic issue only, since the intended use has not been found to <i>cause any other danger or significant impact to the surroundings</i> = The public does not notice.</p>
<p>Masts: 12:6 consultation at the County Administration</p>	<p>Masts: Municipal building permit is required</p>

The fact that the radiation was found to be within the scope of being detrimental or hazardous to the environment or human health of the EC raises an interesting question in relation to the precautionary principle. Can the radiation be a hindrance for a mast permit now, post the decision of the Environmental Court of Appeal of 12 Oct 2005? Legally, the system is not contradictory. Each legal corpus has its set of terms that has to be legally defined, no matter that they may sound similar to terms in other legal corpuses. Although, from an empirical point of view, this may cause problems. The sociologist of law can see that the individuals intervening with the legal system can be confused by the somehow contradictory terminology, affecting the trust in the legal system. A trust that the legal system will efficiently see to that the rights and the obligations of the individuals are consequently taken care of. A legal system losing the public trust can be argued not promoting a sustainable development.

The decision and the design of the beauty contest in Sweden focused growth and regional development and did not address the environmental impact of the construction. The market



premises to a large extent was put out of action already by the license conditions of full coverage and short construction time-limit. The rhetoric of the initial period in Sweden was emphasizing the importance of a fast reach of high coverage. Still, the legal instruments for environmental assessment remained unchanged, and the assessment of the impact of the construction of the 3G infrastructure was left to the municipal permit process of each mast, causing a strain to the system, especially at a local level, with many mast permit processes under a short amount of time. The deficiencies of the legal design around a case of the size of the 3G infrastructure development in Sweden are somewhat linked to the fact that there was no comprehensive assessment made for the entire mobile systems construction. The jigsaw puzzle had to be assessed through its pieces, at a municipal level, one mast at a time. This also means that the antennas that are put on facades in a manner that do not require a building permit falls out of the scope of any assessment at all. In these cases, which are common, the assessment is only manageable if aesthetic reasons provide it..

Bearing in mind the late turning point of letting the antenna activities in under the scope of the EC - most of the national infrastructure had already been built - is it possible that a pressure has fallen on the legal institutions to not find the radiation to be hazardous in a legal sense, forcing a more thorough assessment of each case also under the PBA, leading to an even more delayed infrastructure development? A political pressure that has affected the legal practice. This would be an interesting deficiency

## 6.0 Summing up

3G was never a choice to the Swedish public, due to the EU membership. Neither could anyone escape the infrastructure construction within the country due to the widespread coverage of the licence conditions following on the beauty contest and the strong belief in the technology at the time. No comprehensive assessment was made of the entire system; the infrastructure is assessed through one permit for each mast, at the local level, giving the administrative system an extreme challenge, and giving unexpected environmental and social outcomes as a result from the lack of comprehensive assessment.

The Swedish version of the 3G enterprise is an example of rationalistic planning, emphasizing a strong “Guidance” rather than a collaborative “transformation”, with Friedmanns words. It is centralistic, where experts contributed information to the decision-makers who made the most rational choice based on the values of the decision-maker. Whether or not the public believed in the necessity of the totality of the system is not part in the planning process. The “market forces” are in a sense locked out of the construction due to the fixed total coverage of the populated areas.



The centralized decision of how the radiation shall be taken into account in the 3G infrastructure development is rationalistic (Swedish Radiation Protection Authority standards,



higher court decisions). In this perspective the issue of whether the or not the public fear the radiation is irrelevant. From this perspective the public should not fear the radiation, since all expertise point at that it is not hazardous. This regards the appealed permit processes, above the municipal level. On a local level however, the participatory aspects are stronger. The municipal building committees tend to regard neighbours fearing or having a sceptical attitude towards the radiation as a problem worth taking into account in the local planning. This sometimes leads to a denial of a 3G mast building permit. These communicatory features of the planning process points the local planning towards the planning paradigm (a problem is a problem if someone involved think it is). These features however fades as the appeals reaches the higher courts, and the “black box” of law closes in on the decision making and expert knowledge takes over as the more heavily weighing knowledge.

### The Environmentalist paradigm

The appealed building permit process

The EC: Until Oct 2005: "radiation can not be a hazardous activity"  
Post Oct 2005: "Can in some cases",  
But only in an EC context.

The PBA, above local level: Radiation, or the fear for it, is not a reason to deny a mast building permit.

### The Plan paradigm

Local permit process:  
Neighbours opinions can affect the decision (even if it regards radiation issues).

It is clear that there has been conflicting interests at work in the case of the 3G infrastructure development in Sweden. On one hand a national growth policy, a political will to stimulate a technologically high national profile, a leading nation in the connected global society - and this soon - and on the other hand stands the interests of constructing the extensive infrastructure sustainably, accompanied by a legislation with some inconsistent features when facing matters as radiation fearing individuals, as well as confused or obstructive municipalities, following in the trails of the infrastructure development.

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