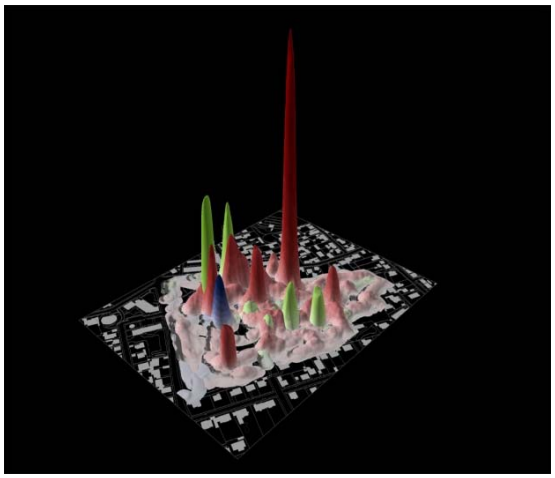
Mapping the City

- Reflections on urban mapping methodologies from GPS to Community Dialogue

Christian Nold, Ole B. Jensen & Henrik Harder



Department of Architecture and Design, Aalborg University, Denmark

Department Working Paper No. 25

December

2008

Mapping the City

- Reflections on urban mapping methodologies from GPS to Community Dialogue

By Christian Nold, Ole B. Jensen & Henrik Harder

Department of Architecture and Design, Aalborg University, Denmark

Department Working Paper No. 25, December 2008

ISSN No. 1603-6204

Author's note

The authors wish to acknowledge support for this research by the Department of Architecture and Design, Aalborg University making it possible to host Christian Nold as Visiting Professor in the autumn of 2008. The paper is the first attempt to open up a new dimension in the research on GPS mapping and urban studies. It is a dimension that moves beyond the technical and explores GPS mapping as catalyst for communal dialogue. The paper is the first step in theorizing and exploring this field and is as such based upon research conducted by the authors separately.

Mapping the City

- Reflections on urban mapping methodologies from GPS to Community Dialogue

> *My 'quarter' is a network of communication lines with intermittent assembly points; and it cannot be located on a map. Yet, place is important; it bears down on us, we mythicise it – often it is our greatest comfort, the one reassuringly solid element in and otherwise soft city. As we move across the square to the block of shops on the street, with pigeons and sweetpapers underfoot and the weak sun lightning the tarmac, the city is eclipsed by the here-and-now; the sight and smell and sound of place go to make up the fixed foot of life in the metropolis*
>
> Jonathan Raban, 1974, 'Soft City', pp. 212-213

Introduction

Representing the city is an issue not easily solved. In the arts, the literature and the many different branches of science engaging with the city (from architecture to engineering and urban studies) the question of how best to re-present the city is crucial. At times this is due to a wish to order the city, to impose on it certain element of power. At other times the aim is to make the city's 'condition' an issue of dialogue between different groups of inhabitants. And yet at other times it simply involves invoking certain feelings amongst ones fellow urban consociates as in the case of great urban novels. Unlike in the introduction quote from Jonathan Raban's novel Soft City the representations of cities and sites in contemporary planning and urban design are marked by a number of 'hard' technologies that offers new opportunities to the understanding of cities. However, at the end of the day we would argue that both the 'soft city' and the 'hard city' need bridging in order to enhance our basic understanding of the contemporary urban situation. A way of exploring this new territory and opening up the 'soft' and 'hard' representations of the city is to look into the application of GPS technology coupled with 'classic' notions of deliberative dialogue and citizens interaction.

In this paper we shall explore two very different ways of approaching representation of place by means of applying GPS technologies. In the first case we present the work of Christian Nold which is focused on developing new participatory models for communal representation that combine innovative art, design and ethnographical methodologies. The projects are initiated in collaboration with a broad range of local institutions such as a community groups, arts organisations, universities and local government in cases where they have identified a particular context where there are social, cultural or political tensions and they feel they do not know how to mediate or deal with these issues. The second case is about GPS mapping of the citizen's use of public parks in Aalborg, Denmark. In collaboration between Aalborg University and the Municipality of Aalborg a GPS based park survey was carried out based on the municipality of Aalborg's landscape division general interest in knowing more about actual park user's use of the parks and the park user's preferences in relations to specific areas in the parks.

The paper is structured in five sections. After the introduction we present a short theoretically informed discussion of the key issue of representing place. In section three we present the first case of participatory communal representation using GPS technology. In section four we move to the second case also about representing place by means of GPS technology but with a very different outset and research design. The paper end with section five in which we offer a short reflection and some concluding remarks.

Ways of seeing the city – notes on the re-presentational logics of urban intervention

In this paper we argue that mapping the city is very much about exploring citizen's notions of presenting the place, and importantly that such representations are always spatially embedded. Needless to say this touches upon notions of power and its relationship to issues of mapping (Jensen & Richardson 2003). It relates to the many ways that for example planning authorities strives for order and control by means of not only particular ways of representing territory but also of 'simplifying' and selectively framing such representations (Jensen & Richardson 2004, Scott 1998). As Beauregard claims, places are newer emptied:

> 'Places are never emptied. Rather what occurs is a form of discursive displacement. Planners and designers substitute a professional narrative for a multitude of shared histories, collective remembrances, and personal experiences. Unwieldy stories about the place are suppressed and replaced by more actionable understandings. Planners and designers abhor narrative vacuums. Even a cleared site has to have a meaning attached to it. To be cleared is to be prepared for, receptive top, a particular intervention … intervention cannot occur, development cannot happen, until site is brought under control, situated in a professional discourse. To arrive there, prior narratives are reduced in number or, in some instances, totally eliminated. Emboldened by simplification and standardization, analytical description thrives. Such representations cast a particular place in terms of a category of "problems" that the professional knows how to solve' (Beauregard 2005:54)

Excavating what the embedded meanings and cultures related to places beyond the official development discourses and business leaders however is what we want to address more specific. But also is seems important to include a discussion on the relationship between representations, technologies of representation and the participants in any deliberative account for the environment. Here we would argue that the meaning of technologies and artefacts as mediating elements in a process of collectively constructing a representation of place is less well reflected (see Jensen 2007 for one such approach). Arguably any intervention in urban space is related to, or understood by reference to a particular way of re-presenting that specific site or place. We thus face what has been termed the notion of the 'representational logic of urban intervention'. By this is meant that:

> '… any given urban intervention is embedded in a linguistic representation (and at times a visual one). Such representation is understood to be based upon a set of values and norms guiding the intervention. Using the concept of the representational logic of urban intervention therefore means that interventions are framed by representations that express a specific logic in the sense of a set of guiding principles and values.

> Social agents give voice to ideas of spatial change in the city by means of local narratives and stories nested within discourses (Jensen 2007:218)

So we want partly to inscribe this research into the strand of contemporary planning theories working positively with narratives and stories as a baseline for understanding urban planning and design (Eckstein & Throgmorton 2003, Marling 2003, 2005, Sandercock 2003). Accordingly stories always prevail, and also equally with a geographical component to them:

> '… story and imagined communities always have a spatial dimension and make a geographical claim. Neither authors nor readers always recognise this spatiality, but it is present nevertheless' (Eckstein & Throgmorton 2003:6)

This 'spatialisation of narratives' is precisely also what Till has discovered is the point about having architects performing as storytellers and story-listeners in participatory processes within urban planning:

> 'All of us have stories within us, be they descriptive of the past, fictional for the future, anecdotal or practical. Stories have within them elements that are both personal and social, they become a means of describing one's place in the world, of locating the individual within shared spaces. Stories are the places where the imagination finds lines of flight' (Till 2005:38)

Accordingly, it is through urban storytelling the architect facilitates the 'negotiation of hope'. So what is needed is a refinement of our thinking about the relationship between power, the social and the spatial. This means that spaces and places are represented and intervened into according to a complex dialectics of socio-spatial relations:

> 'The basic proposition is that the socio-spatial relation **works** by means of its coercive or enabling capacities for spatial practices. Furthermore the socio-spatial relation conveys **meaning** to social agents via multiple re-presentations, symbols, and discourses. Thus the socio-spatial relation on the one hand expresses possibilities and limitations to social actions within the built environment. On the other hand the meaning and valuation of this relation is constantly negotiated and re-negotiated on the basis of social imageries and cultural values. This dialectic tension furthermore expresses a politics of scale in the sense that socio-spatial practices and meanings produces and re-produces spatialities at scales from the body to the global, as in the case of the new forms of socio-spatial mobility' (Richardson & Jensen 2003:15, bold in original)

Coming from such a relational socio-spatial optics the issue is then how to understand the representational logics in its spatial context? This amount to develop a notion of spatial narratives as being not only representations of space, but also as performative and interventional 'space producers':

> 'Discourses produce lived spaces, and actions within lived spaces in turn shape discourses. If discourse is necessary for attaching meaning to things in everyday life

> (as much as in policy making, which is just one of those things that happen in everyday life), then analysis of discourse is inseparable from the analysis of space. In fact, analysis of space requires analysis of discourse if we are to understand how spaces come to be as they are, how people exist and act within spaces' (Jensen & Richardson 2004:43)

We are thus proposing to open up the tool box in community planning and urban design by moving beyond traditional approaches to community planning and design (Wates 2000). In this way we inscribe the explorations in this paper into more resent attempts to make sense of experimental participatory methods (Jones, Petrescu & Till 2005). Here we shall argue that seeing the city as a physical as well as a social entity means that the representational techniques applied also should aim at exploring the socio-spatial relation. Furthermore this is more that a discussion of techniques and instruments. As argued elsewhere: '*it is only through understanding the relationships between representations of space and the material practices which create spaces that we might be able to assess the role of models in creating just cities*' (Tait & Jensen 2007:110). We want to end this short theoretical framing by referring to the definition / discussion of mapping within the 'Metapolis dictionary':

> 'Neither descriptive and literal, nor analytical and objective representation any longer serve to deal with the dynamic, unfinished reality that is in constant mutation. Representation of the city – like that of reality itself – thus calls for a tactical, flexible and digital, more operative cartography … to map this new reality – the result of mobility, interchange, migration and communication – requires purposeful attention to strategic factors capable of generating possible evolutions and interactions within the system …' (Cross 2003: 415)

Here we shall not claim to have solved the complex issues related to the strategic meaning of mapping and its inherently political nature in representing territory (see Miessen & Basar eds. 2006). However, we do claim that we are embarking on a journey towards decoupling particular strong and powerful technologies and tools like GPS from the state led control agencies and the cool business players alone. The first step on such a journey start with the little practices of experimenting with the ways GPS tools can both map the city as well as it can facilitate the deliberation about what to do with the city. In other words we shall now turn to cases of bridging the 'soft' and the 'hard' city.

Case one - Towards new participatory models for communal representation

The crisis in political and cultural representation that voiced itself in the 1960's through demonstrations and counter culture has triggered a long lasting shockwave that forced cultural and political institutions to widen public access (see e.g. Klein 2001). In response a range of practical and academic discourses have emerged to formulate ways in which global, national as well as local decision making processes can be democratised. Within the field of local planning, Neighbourhood Mapping and Participatory GIS emerged to try to allow people to voice their opinions.

The work of Christian Nold is focused on developing new participatory models for communal representation that combine innovative art, design and ethnographical methodologies. Since 2004,

the research has been carried out through the setting up and leading of large scale participatory projects in over 16 countries that have involved over 2000 people. The projects are initiated in collaboration with a broad range of local institutions such as a community groups, arts organisations, universities and local government. These groups usually initiate and seek funding for these projects. They approach Christian Nold because they have identified a particular context where there are social, cultural or political tensions and they feel they do not know how to mediate or deal with these issues. In the UK these tension areas, tend to be regeneration areas that the government has identified as places for development, where the public consultation process for local decision making has been inadequate or failed. In those cases the project funders are often interested in having an outside person come with alternative methodologies and creatively engage with local people to voice their fears, opinions and aims.

Case Studies

Here we briefly will examine a couple of UK case studies to discuss the typical structure, methodology and tools used during these projects. The 'Stockport Emotion Map' (2007) was initiated funded in collaboration between the local Stockport town council and a property developer in charge of altering the town centre. The 'Brentford Biopsy' (2008) was commissioned by a local art centre trying to connect with the local community and council in relation to the proposed development of the town centre. The projects start by working with the hosting organisation to identify formal and informal stakeholders such as local history or ecology groups which are then formally invited to take part. Depending on the local context the project proceeds through a series of public events and workshops. In both of the case studies posters and leaflets were designed and distributed in the local area a number of weeks before the events. In the case of Brentford the workshops were held in the gallery itself, while in Stockport these workshops were supplemented with a stall in the local market where local people passing by could be approached and involved in activities.

The general process of working with local people during workshops is one of collecting their thoughts and sensory impressions using a variety of unusual 'tools' and then communally reflecting on them with the group of local people (See fig. 1). After each workshop the data is analyses and visualised. In Brentford the attempt was made to do the analysis and visualisations with the project participants during the workshop themselves but with mixed results. After the whole series of workshops is complete all the material gathered is turned into a communal 'map' which is then exhibited and distributed locally.

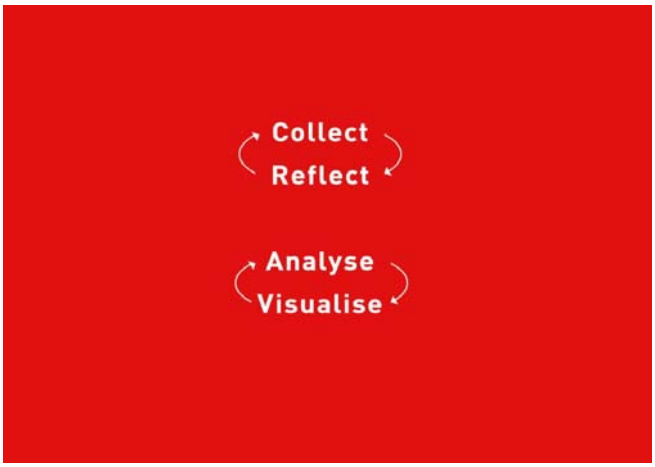


Figure 1: Process of working with local groups

The workshops are usually organised with 8-10 local people at a time, the group often contains a mix of members of the public as well as 'specialist' like historians, politicians etc. The workshops start with everybody introducing themselves and then a short presentation by the artist of the overall context as well as the specific tools to be used that day.

Performative Sensory Technologies

The workshop participants use a range of tools that were developed specifically to focus on the participant's experience of place. The Brentford project combined Bio Mapping, Sensory Mapping, Noise Mapping and Drawing Provocations. Bio Mapping is a special device invented in 2004 by Christian Nold that consists of a combination of GPS unit and Galvanic skin response sensor and data logger. This device records the wearer's physiological arousal which is a simple indicator of emotional state in relation to their geographical location. During a workshop, participants are wired up with the device and sent out to walk in the local area for a period of about an hour. On their return the data is downloaded from the Bio Mapping device, processed and then instantly visualised for the workshop group. People's walks are visualised in Google Earth using a series of geographically located peaks and troughs of their emotional arousal. Arousal is not necessarily positive or negative and is best thought about in terms of heightened attention to one’s body or surroundings. During the workshop each participant takes a turn at examining their own 'emotion track' and discussing what happened to them on their journey. People often recount a wide range of events, which encompass the whole breadth of life from dangerous traffic crossings, seeing beautiful flowers to feeling uncomfortable walking past a house where their ex-partner used to live. While the participants are recounting their journey notes are taken and are entered along the route as waypoints in Google Earth. These individual personal observations usually trigger discussions amongst the group about larger local issues. In the case of Brentford and Stockport these discussions focused on the way the previous developments of the towns had neglected and destroyed the industrial and recent history of the towns. It also focused on the social effects of this neglect and suggested concrete ways in which interventions could improve the local context. Here it

becomes clear that we are exploring ways of thinking about urban representation that taps into different epistemologies and methods. One is GPS as an empirical analytical approach and another is the emotional and communal analysis as a phenomenological and interpretative approach (Delanty & Strydon 2003). Other tools such as Sensory Mapping use blindfolds, ear defenders to disable certain senses like hearing while heightening the experience of others like smell. The aim of these tools to focus people on their own sensory and emotional experiences of places and in the workshops setting to then scaling up this individual impressions towards larger communal discussions.

In the experience of Christian Nold people often get involved with the projects because they want to explore how the devices can record or alter the perceptions of their own body. This excitement is heightened by people's understanding that the Galvanic Skin Response sensor that the Bio Mapping tool uses is based on technology used in the Polygraph or Lie Detector. Participants often described the sensation of using the Bio Mapping tool as a kind of personal Reality TV show where they can see their own life documented in front of them. This idea suggests something similar to Berthold Brecht's notion of 'Verfremdung' or alienation from their personal experience of life (Ungvári 1979). Brecht's notion is that this distancing allows the viewer to take a critical distance on viewed events. In this case the participants are vocalising their behaviour in the world as well as internal mental life to a communal group. Rather than being placed in the spotlight to explain their behaviour, the participants are carrying out a type of co-storytelling with the technology that allows them to creatively disclose or omit as much as they like of what actually happen during their walk. The Bio Mapping and Sensory Mapping tools act as 'performative technologies' which offer a safe distancing from public embarrassment by shouldering the burden of having to hold the public's attention. Used in this way the tools allow people who have never met each other to tell each other elaborate and strongly detailed descriptions of the local neighbourhood in a way that they would have never done otherwise. In a sense this resembles some of the experiences made by applying GPS technologies to different types of participatory planning cases in Estonia as for example bike route planning or discussions of ecological footprints (see Pae, Ahas & Mark eds. 2006).

By sharing their experiences about the local area in this communal setting, the initial fascination with the personal body quickly becomes one of discussing the larger social body. Where are the points of similarity and difference between the tracks of all the people at the workshop? This ability of talking about shared spaces quickly prompts discussions about public space and makes people look for larger communal patterns.

Local Connection & Networks

The activity of identifying patterns and general sense-making in the local area is further developed by two other activities, Drawing Provocations and Issue Networks. Drawing Provocations involves people being asked to sketch their responses to a variety of provocations about their daily lives such as what really annoys them about the town, where they meet their friends, as well as who are the most important and dangerous people in town. Other provocations often focus on the town and its history, river and landmarks. Once past the initial embarrassment of having to draw, people often create images that cut through the superfluous language being used to discussing controversial topics and visualise the key issues in an often humorous and playful way.

The Issue Networks activity extends on Drawing Provocations and asks people to look for links within issues see how they are connected and interrelated. Conceptually this activity is based on Actor Network Theory (Callon & Latour 1992) but interpreted for practical use. In Brentford, for example this activity revealed the issue of local roads as being fundamental to local problems such as the lack of public space and social activity and connected it to many factors including Brentford's history as a transport hub from the Roman period. This ability to see the local area as a network with different actors who have a hand in changing the local landscape acts to empower the participants, many of whom said that that they could suddenly could see Brentford as a 'whole'. This articulation comes close to what Frederick Jameson (1991) hypothesised as 'Cognitive Mapping', an activity for seeing one's life in relation to larger umbrella networks of political and cultural power relations.

The Maps

At the end of the workshop period all the material that has been created from the different activities is collected together and used to design a communal map (Fig 2). In the case of Stockport this was 1500 printed maps in the style of the official UK Ordnance Survey map. In the case of Brentford this was a 10 meter long banner map which was exhibited in the local gallery as well in local institutions like libraries and council offices. The main aims of these maps are to creatively interpret the findings from the workshops and to offer an alternative mirror back onto the local area.

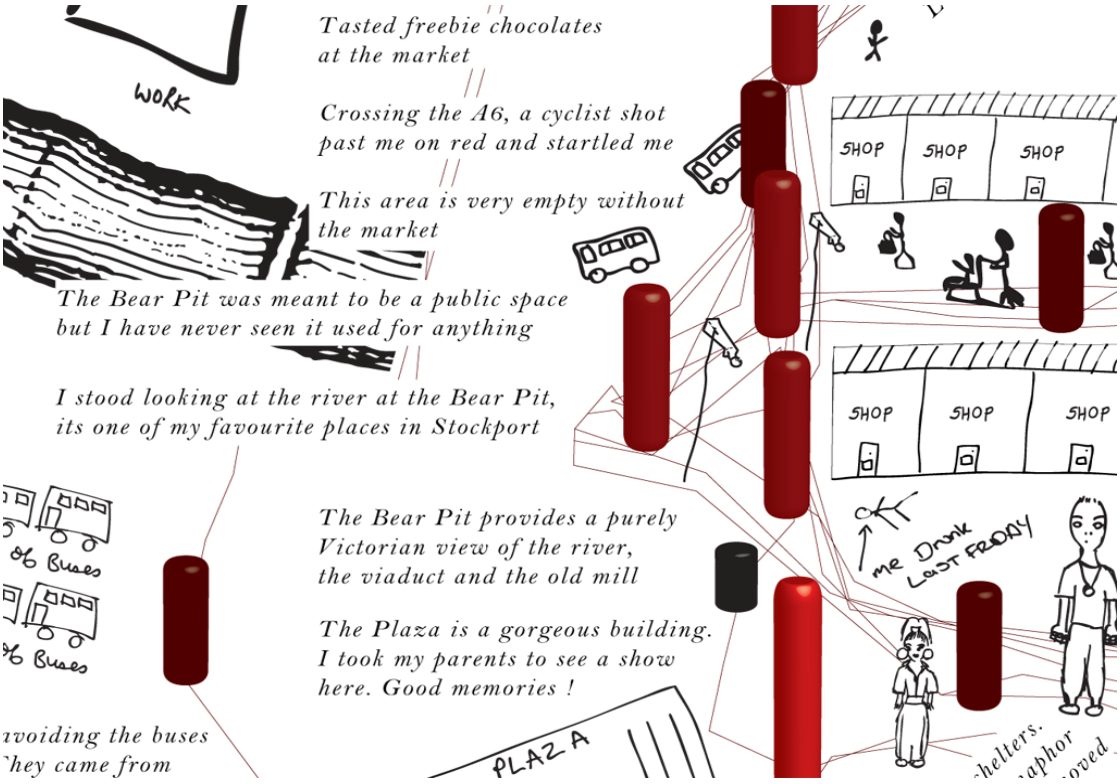


Figure 2: Communal map from Stockport

Visualisations chosen for Brentford and Stockport where in both case very deliberate. In Brentford the map is divided into "*four interrelated sections that suggest a left to right narrative from the past towards the future, as well as a progression from the static towards the fluid and malleable*." These four parts allow people to make sense of the hugely complex 10 meter map as well as allow them to identify the as yet malleable local elements that can be influenced. In the Stockport case the map has been created in the visual metaphor of a Industrial Revolution era map, since this is the period when most of the crucial changes took place in Stockport that still affect people's lives there. The prominence of the river on the map emphasises the effect the blocking up of the local river has had on loosing the towns identity and link to the past. In both the Stockport and Brentford map heavy use was made of the drawing created by local people themselves who were in this way literally drawing their own towns in a human comprehensible way. These types of alternative visualisations are important for establishing a local visual & cultural discussion as well as a purely political one. The second aim is to instigate wider political discussions that include those that did not take part in the workshops to deal with local issues. In Stockport for example we identify a number of issues such as the lack of public space that require political answers which can only be influenced by mobilising a large public discussion.

Reflections & Evaluation

The methodology has so far proven its adaptability, from a project in northern Italy where it has been used to identified the political dynamics behind a park where a most of European drugs smuggling takes place to a school in India where it's has been used with children to identify notions of neighbourhood, to towns in northern Spain where it has been used to develop new models for participatory tourism.

The focus for these projects is moving strongly towards enabling evaluations that can prove the profound effects this kind of participatory method of mapping spaces can have on those taking part in the workshops. In an independent evaluation of the Brentford Biopsy, roughly half of all the participants stated that taking part in the project changed their way of seeing Brentford. Most interestingly though is the fact that 100% of all the participants who took part in some form of professional capacity changed their way of seeing Brentford. Crucially, these professionals included amongst others the major of Brentford as well as representatives from local community groups. It is these specialists who have are usually hardest to reach and with the most entrenched positions seem to have the most to gain by participating in this type of activity. Furthermore 100% of all the Brentford participants who answered as part of the evaluation thought the map should influence local policy.

The main challenge that remains is to enable the political decision makers to implement the findings of the projects. The findings are rarely five easy bullet points and often tend to be complex or politically unpopular with local business. Often they include findings such as, there is no local public space, or the youth provision is very poor. This challenges of how to achieve political potency is also faced by many of the practitioners in areas such as Neighbourhood Mapping and Participatory GIS. There seem to be two possible directions for extending the reach of these types of activities. The first direction is to go beyond the participatory mapping and to offer full design solutions to the local problems. In the case of Brentford for example this may include an

architectural plan for restructuring the town centre to increase public space or in Stockport to reveal the hidden river.

The alternative direction is for participatory mapping to work much closer with local community groups to enable them to implement physical changes themselves while bypassing the established political institutions. So a local group could take over the role of setting up the local youth provision rather than waiting for the local council to do something about it. Of course neither of these solutions is mutually exclusive and should be chosen on a case by case basis. Perhaps the main conclusion of participatory mapping is that all local contexts require their own local specificity in terms of answers and approaches. Perhaps it is ironic that this specificity can often today only be provided by external practitioners that exist to mediate local actors and bring new cultural and political models.

From these explorations with Nold's particular ways of applying GPS technologies and using them in facilitating deliberation over communal issues we shall now turn to a more 'traditional' research setting with application of GPS technologies used to map particular practices related to the use of public parks. However instead of being overly focused on mainstream application of the technology we want to take this case in the direction of more ethical deliberations.

Case two: The Aalborg parks survey project background and the top down approach

Based on several talks in autumn 2006 with representatives from the municipality of Aalborg's landscape division the possibility of testing a GPS based park survey was developed together with Aalborg University (Harder, Nielsen, Bro & Tradisauskas 2008; Harder, Nielsen, Lassen & Godtved 2005). The point of departure of these talks was the municipality of Aalborg's landscape division general interest in knowing more about actual use of the parks and the park user's preferences in relations to specific areas in the parks (Ostermann & Timpf 2007).

Based on a political demand for a quantity based user satisfaction survey of selected parks the head of division found it interested to introduce GPS technology as a part of a more general survey about park-users satisfaction. There was no paradigm developed by the municipality of Aalborg's division of landscape for park user satisfaction survey and it was thereby suggested by Aalborg University to make a user satisfaction survey base on a quantity based park survey concept developed at the KVL department at the Universtiy of Copenhagen (Denmark) and to this setup to add a new GPS technology component. The KVL survey concept is as survey method based on questionnaires done with park users randomly selected using a specific statically selection method to secure that results are representatively validated (Jensen 2003, Jensen & Guldager 2004). This would give the municipality of Aalborg's landscape division the possibility to compare parts of the results from the Aalborg park surveys with other park surveys done primarily in the Copenhagen area and to gain a unique insight in the actual park user behaviour and use of specific areas using the GPS data (Shoyal & Isaacson 2007).

The Aalborg parks survey project setup

Three parks in the central Aalborg City area were first chosen by the municipality of Aalborg's landscape division and during the actually work with the surveys a forth park was added. Based on

the areas size of the three first parks the estimated amount of users, and a time schedule it was suggestion to develop a survey method which could be reused in all parks but still based partly on the KVL survey concept. A paper based questionnaire was developed reusing central question concerning user satisfaction from the KVL survey concept. Based on considerations about logistics and economics it was chosen to skip the representative statistical selection method used in the KVL survey concept to select park guest in the park and instead base every park survey on respectively a week day and weekend day and do the extradition and collection of the paper-based questionnaires and GPS units at the most used entrances in the parks. The survey representatives at the chosen entrances should contact all park users entering the specific park. The survey representatives should then invite park users to participate in a survey carried out by Aalborg University in co-operation with the municipality of Aalborg. If the user did not want to take part in the survey, the survey representative tried to carry out a refusal survey consisting of very few questions.

If the visitor accepted to take part in the survey, a GPS-unit would be handed out to the visitor, and he or she subsequently turned into a respondent in the survey. The respondent would then be asked to carry the GPS-unit during the whole visit in the park until he or she was about to leave the park. At the exit of the park the respondent was furthermore asked to fill in a questionnaire and to deliver the GPS-unit back. If the survey representatives did not have any more GPS-units or the respondents did not want to carry the GPS-unit but still wanted to participate in the survey, the survey representatives only carried through with the questionnaires at the exit of the park, and a GPS-tracking was thus not carried out.

The questionnaire part of the survey therefore included all visitors it was possible to contact at one of the chosen entrances/exits and who agreed to participate in the survey. Whereas the GPS-tracking only consists of park users who agreed to carry a GPS-unit and where it was possible to hand-out a GPS. The refusal survey consisted of the park visitors who did not wish to participate in the park survey but who agreed to participate in the refusal survey. In addition to this there were also park users who did not wish to participate in any of the surveys or to be contacted at all. These visitors were enumerated separately by the survey representatives. Because of the limited numbers of available hardware units (in total 50 units), the units were distributed during the survey days among the entrances of the park in question, compared to the estimated number of visitors that would enter the park (Horst, Lyseen, Skov, Harder & Bro 2007A, 2007B, 2007 C, 2007D).

The Aalborg parks survey, the process, time span and parks

The survey was carried out in four parks in Aalborg during August 2007 and 4.462 park visitors were contacted. Each park survey consisted of two separate survey parts: a GPS tracking of respondents in the park and a questionnaire survey of respondents visiting the park. The GPS-Park survey was carried out in Mølleparken on Wednesday the 8th and Saturday the 11th of August 2007 (both days in the interval between 06.00 and 22.00).

Figure 2: Research assistants with survey charts and GPS transmitters at a park entrance

In Mølleparken the survey took place on Wednesday the 8th and Saturday the 11th of August 2007 (both days in the interval between 06.00 and 22.00). In Søheltens Have the survey took place on Thursday the 16th and Saturday the 18th of August 2007 (both days in the interval between 07.00 and 19.00). In Skanseparken the survey took place on Wednesday the 22nd and Saturday the 25th of August 2007 (both days in the interval between 07.00 and 19.00) and in Kildeparken on Wednesday the 29th of August 2007 (in the interval between 07.00 and 19.00). All above mentioned dates and time intervals were prearranged with the municipality of Aalborg.

Technical considerations

In the light of a number of various deliberations a GPRS based hardware unit (Flextrack Lommy©) with a built-in GPS was chosen to the completion of the Aalborg GPS-park survey: firstly the design of the unit was simple, the unit was light and small (it only weighs 99 gram and the dimensions were 74x61x23 mm), and it had only one small red on/off button (Simonsen, Bro, & Harder 2007). Secondly the choice of this hardware unit gave the opportunity to follow the hardware unit online and in real time so that respondents leaving the park without having passed survey representatives at the chosen entrances could be tracked and caught up with. However, some hardware units were lost, some were accidentally left in the park but thanks to the above mentioned tracking system it was possible to locate and collect them. A few other units were collected at the respondents' home address (in total five units from all four surveys) and in addition to this three hardware units were lost during all four surveys. One unit was destroyed by a young man participating in one of the surveys and the parts were found in the park. Contact to another of the hardware units was lost in the same park during the survey and the hardware unit was not found. The last hardware unit was tracked to an address and the potential respondent contacted but did not want to return it.

Ethical considerations

Several considerations about the ethical aspects using GPS tracking was discussed before the launch of the park surveys and several ethical research questions was raised. First and foremost was the issue of the willingness of the respondents to carry a GPS-unit during the stay in the park. Secondly the trustworthiness of data and thereby the respondents' patterns of activity can be questioned. The

respondents' activity patterns could in theory be influenced by the fact that they knew their patterns of activity were mapped even if it was a complete anonymous registration as in the reviewed GPS-Park example. This could be the case even in the described park GPS based surveys but would be a more crucial problem in other types of surveys involving activity patterns covering home and work addresses (Renenger 2002). The discussion lead to the formulation of an 'ethical charter', the so called "Aalborg ethical GPS survey charter" (Harder, Nielsen, Bro & Tradisauskas 2008) concerning the use of GPS technology in the park surveys done at Aalborg University involved in the described park surveys:

"The Aalborg ethical GPS survey charter":

> *In the DMB/DUS research projects you are asked if you want to participate before the registration starts. It is voluntarily to participate and you can at any time back out of the project. If you are a participant you will be asked to wear a GPS unit e.g. for 7 days. The GPS unit will register where you are. If you as a participant does not want to register where you are you can immediately turn off the GPS unit.*
>
> *In the DMB/DUS research project we present different examples of types of analyses for each participant. These examples show the types of analyses we want to accomplish starting from the data we want to collect from each participant. The participant will sign a contract in which we set out how and in what connection the registered data will be used and to whom they are available.*
>
> *In the DMB/DUS research project the researchers keep and protect the data and this information is not passed on to third parties who are not mentioned in the contract between participant and the project. This also counts for official authorities or other third parties e.g. the police as long as it doesn't contradict existing EU and national legislation.*
>
> *In the DMB/DUS research project we do not give financial compensation for participation. Instead we draw lots for a number of prizes among the participants who have been chosen to participate in our research projects and who provide data of the best quality.*
>
> *In the DMB/DUS research projects GPS units are handed out and we hope that participants will take part in the data collection starting from the entered agreements and will not misuse data or use false identities.*

The reason to move from technologies issues alone towards issues of the ethical implications in relation to this GPS mapping project partly came out of a question of research ethics. In other words how much can researchers do in terms of surveillance before an ethical threshold is being violated? But moreover, this perspective also seems to draw much public attention. Thus often when the research project had part-results ready for dissemination into the public the researchers in contact with the press found that the ethical discussion about surveillance seemed to trigger more interest amongst the journalists than the actual results. Needless to say this is very legitimate but moreover this goes to show that GPS technologies carry a strong potential as 'evocative objects' and thus also

thereby carry a potential for opening up public and critical deliberation about what to do with the different networked and mobile technologies that increasingly set their mark on contemporary society (Jensen 2008).

Evaluation

In the light of the Aalborg GPS-Park survey it can be concluded that the results from GPS based surveys can absolutely and with success be used to analyze activity patterns and to communicate knowledge about the usage of specific urban areas to both researchers/scientists, professional users and citizens. Although the prices on the GPS hardware is decreasing, working with GPS based survey methods is still quite costly and raises some questions which are important to discuss before considering using the method.

After the Aalborg GPS-Park survey were completed the GPS data and questionnaire data from one of the parks (Skanseparken, N = 293) were joined and connected in one database. Based on GPS trackings from 132 respondents participating in the GPS part of the park survey a joined dataset was established. The joining of the data was done qua a script based on the arrival and departure time of every single respondent and was afterwards manual checked. Based on interviews with two representatives from the Municipality of Aalborg three types of GIS analysis were developed. The main problem here was that the representatives' daily practices were based on a specific set of requirements and was furthermore based on what is needed for operating the parks. During the interviews focus was narrowed down to three themes, "respondents' used time" "respondents' use of different areas" and "respondents' speed" (e.g. average speed of the movements). Working with the three themes much time was used coping with the classical GIS problem: "*To express a complex set of data (huge amount of information) in a simple and yet understandable way*" (Kwan 2000).

Working with "respondents' used time" a classical GIS visualization technique was used based on the accumulated respondents' time in the park during the survey. The data were processed using standard point density in ArcGIS (Output cell size 0,01. Neighborhood settings, Search radius 10m circle aera, units square meters). In ArcScene we used a unit convention on 10 (z) to enhance 3d visualizations. It was chosen to use this type of GIS visualization although the drapings created by point density processing method did spread the original GPS information, indicating e.g. that the areas outside the paths of the parks were used even though this was not the case.

Working with the theme: "respondents' use of different areas" much attention was focused on the actual time used in the different areas of the parks. Using this classical GIS visualization also raised some classical GIS problems concerning the differences in the GIS visualization in case of "*few respondents spending long time or many people spending short time were using the same space/area*". A satisfying visualization and solution was not found as it was chosen to visualize data using fixed time span (half hour) based on the accumulated respondents' time in the park. The theme "respondents and speed" has also caused some trouble because of ethical considerations combined with classical problems about data complexity. The GIS visualizations and the analyses became too complex for the representatives from the Aalborg Municipality using many respondents (more than 5 respondents) and raising severe ethical considerations about exposing single respondent's activity patterns.

Conclusions and reflections between GPS and Community Dialogue

We shall now move towards a few general inferences to be drawn from these two admittedly very different cases. Moreover we shall aim at pointing at further issues of both theoretical and empirical nature that might be explored in the light of this research.

As we showed in the case of Nold's communal mapping methodologies this kind of participatory method of mapping spaces can have a strong and positive influence on those taking part in the workshops. The main challenge that remains is to enable the political decision makers to implement the findings of the projects. There seem to be two possible directions for extending the reach of these types of activities; 1) to move beyond participatory mapping towards full design solutions to the local problems and the people involved and 2) to work much closer with groups in the community in order to enable them to implement physical changes whilst bypassing established political institutions. Neither of these solutions are mutually exclusive and should be chosen on a case by case basis. Perhaps the main conclusion of participatory mapping is that all local contexts require their own local specificity in terms of answers and approaches.

From these explorations with Nold's particular ways of applying GPS technologies and using them in facilitating deliberation over communal issues we shall now turn to a more 'traditional' research setting with application of GPS technologies used to map particular practices related to the use of public parks. However from being focused on more mainstream application of the technology we want to take this case in the direction of more ethical deliberations.

In relation to the second case of the Aalborg Park survey we saw a double set of issues dealing both with the technical and the ethical. Technically the design of the unit was simple, the unit was light and small (it only weighs 99 gram and the dimensions were 74x61x23 mm), and it had only one small red on/off button. Secondly the choice of this hardware unit gave the opportunity to follow the hardware unit online and in real time so that respondents leaving the park without having passed survey representatives at the chosen entrances could be tracked and caught up with.

We have in a sense elaborated in two distinct directions based upon the same technology of GPS mapping. Thus the innovative dimension to the first case was the application of GPS in facilitating and mediating a communal deliberation process. The second case, being more traditional in its set-up, has been added the new dimension of ethical deliberation. So we want to argue that GPS mapping technologies may require deeper reflections upon its relations to the social and the normative. But moreover, we start to see this application of GPS technologies as going beyond representation. By using GPS in mapping communities we are in fact engaging in facilitating these communities in their reflective understanding of themselves and their environments. So rather than being technologies 'next to' social and geographical fields of interactions, we see the GPS tools as complex and networked artefacts facilitating, engaging, stimulating social groups and their interaction. We thus have left the idea of having separate technologies and communities that may or may not 'impact' each other in various more or less rational ways. Instead we see GPS mappings as illustrative examples of the blurring of the division between the 'social' and the 'technical' (Jensen 2008, Latour 2005).

Needless to say this raises a number of epistemological issues and in particular if we face the discussion of 'objective' and 'accurate' mappings and representations. An issue which can be further stressed in discussions about the actually design of the maps done on the data produced in both cases. Obviously we could attach data to 'particles' (in this case moving humans) producing many sophisticated maps and data-files but at the end of the day what we find of particular importance is the dialogue and deliberation mediated by such representations. Put differently; we are interested in the *meaning* of these representations of 'particles' and data. Here we want to argue in favour of opening up the monopoly of 'making sense' of these representations to wider publics and social groups in the city. It is within this realm of GPS applications output such as maps that we see a large and until now mainly unused potential to architecture, planning, urban design and other fields of deliberative practices. In particular it becomes interesting when GPS and its data becomes subject to a dialogue between residents and citizens. By mediating dialogue via technologically produced images and representation we see new potentials for the application of GPS based technologies in deliberative and participatory processes of urban planning and design.

We shall end as we began this paper; within the realm of fiction. The great Italian writer Italo Calvino who in his book '*The Invisible Cities*' present a number of imaginary dialogues between the travelling story-teller Marco Polo and the curious listener Kublai Kahn thus noticed that there is a rather complex relationship between the city and its representations. A relationship that might be thought of as ambivalent, full of tensions, and most importantly thought-provoking: '*no one knows better that you, wise Kublai, that one must never confuse the city with the statements describing it. And yet, there is a connection between them* ….' (Calvino 1972:55, our translation).

Bibliography

Beauregard, R. A. (2005) *From Place to Site: Negotiating Narrative Complexity*, in C. J. Burns and A. Kahn (eds.) (2005) Site Matters. Design Concepts, Histories, and Strategies, London: Routledge, pp. 39-58

Callon, M, Latour, B (1992), "*Don't throw the baby out with the bath school!A reply to Collins and Yearley*", in Pickering (Eds),Science as Practice and Culture, The University of Chicago Press, Chicago, IL, pp.343-68.

Calvino, I. (1972) *De Usynlige Byer*, København: Tiderne Skifter

Cross, S. (ed.) (2003) *The Metapolis dictionary of advanced architecture. City, technology and society in the information age*, Barcelona: Actar

Delanty, G. & P. Strydon (eds.) (2003) *Philosophies of Social Science. The Classic and contemporary readings*, Maidenhead: Open University Press

Eckstein, B. & J. A. Throgmorton (eds.) (2003) Story and Sustainability. Planning, Practice and Possibility for American Cities, Cambridge, Mass.: MIT Press

Harder, H; Nielsen, T. A. S. ; Bro, P.; Tradisauskas, N. (2008) *Experiences from GPS tracking of visitors in Public Parks in Denmark based on GPS technologies*. In: Urbanism on Track : Application of Tracking Technologies in Urbanism. eds. / F.D. van der Hoeven ; J. van Schaick ; S.C. van der Spek ; M.G.J. Smit. IOS Press BV, Amsterdam, The Netherlands, 2008. 9 p.

Harder, H; Nielsen, T. A. S. ; Lassen, C. ; Godtved, S. (2005) *The potential for the exploration of activity patterns in the urban landscape with GPS-positioning and electronic activity diaries.* In: International Conference for integrating Urban Knowledge & Practice : Conference Proceedings. Göteborg, Sverige : Life in the Urban Landscape, 2005. 12 p.,

Horst, N. R.; Lyseen, A, K. ; Skov, H; Harder, H ; Bro, P. (2007A) *Borgerundersøgelse – Kildeparken*, august 2007: Kildeparken, Aalborg Universitet, Danmark (Helpark - DUS; Skriftserie 14

Horst, N. R.; Lyseen, A, K. ; Skov, H; Harder, H ; Bro, P. (2007B) *Borgerundersøgelse – Søheltens Have*, august 2007: Søheltens Have, Aalborg Universitet, Aalborg (HelPark - DUS; Skriftserie 12).

Horst, N. R.; Lyseen, A, K. ; Skov, H; Harder, H ; Bro, P. (2007C) *Borgerundersøgelse – Skanseparken*, august 2007: Skanseparken, Aalborg Universitet, Aalborg (HelPark - DUS; Skriftserie 13).

Horst, N. R.; Lyseen, A, K. ; Skov, H; Harder, H ; Bro, P. (2007D) *Borgerundersøgelse – Mølleparken*, august 2007: Mølleparken, Aalborg Universitet, Aalborg. (Helpark - DUS; Skriftserie 11).

Jameson, F. (1991) *Postmodernism or, the cultural logics of late capitalism*, London: Verso

Jensen, F. S; Guldager, S. /2004) *Den rekreative brug af tre parker i Københavns Kommune – Enghaveparken, Fælledparken og Amager Fælled, 2003-2004.* I: http://www.vejpark2.kk.dk/publikationer/pdf/408_KBH_rapport_netversion.pdf

Jensen, F. S. (2003) *Friluftsliv I 592 skove og andre naturområder*. I: http://www.sl.kvl.dk/Videnblade/%7BDDA1C2BF-BAE9-4A9A-8C76-622A53D64F08%7D.pdf

Jensen, O. B. (2008) *Neworked mobilities and new sites of mediated interaction*, in K. Terzidis (ed.) (2008) What Matter(s)? First International Conference on Critical Digital, conference proceedings, Boston: Harvard Graduate School of Design, pp. 279-285

Jensen, O. B. (2007) Culture Stories: Understanding Cultural Urban Branding, *Planning Theory*, vol. 6(3), pp. 211-236

Jensen, O. B. & T. Richardson (2004) *Making European Space. Mobility, Power and Territorial Identity*, London: Routledge

Jensen, O. B. & T. Richardson (2003) Being on the map: The new Iconographies of Power over European Space, *International Planning Studies*, Vol. 8, No. 1, pp. 9-34, 2003

Jones, P. B., D. Petrescu & J. Till (eds.) (2005) *Architecture and Participation*, London: Routledge

Klein, N. (2001) No Logo, London: Flamingo

Kwan, M. (2000) *Interactive geovisualization of activity-travel patterns using three-dimensional geographical information systems: a methodological exploration with a large data set*, Transportation Research Part C 8 (2000) 185±203, Kwan, M. / GIS METHODS IN TIME_GEOGRAPHIC RESEARCH: GEOCOMPUTATION AND GEOVISUALIZATION OF HUMAN ACTIVITY PATTERNS. I: http://www.blackwell-synergy.com/doi/abs/10.1111/j.0435-3684.2004.00167.x

Latour, B. (2005) *Reassembling the social*, Oxford: Oxford University Press

Marling, G. (2003) *Urban Songlines. Hverdagslivets drømmespor*, Aalborg: Aalborg Universitetsforlag

Marling, G. (2005) *Bangkok Songlines. Spaces, Territories, Mobility*, Aalborg: Department of Architecture and Design

Miessen, M . & S. Basar (eds.) (2006) *Did someone say participate? An Atlas of spatial practice*, Cambridge, Mass.: MIT Press

Ostermann, F.; Timpf, S. (2007) *Modelling Space Appropriation in Public Parks*. I: Department of Geography, University of Zurich, 10th AGILE International Conference on Geographic Information Science 2007, Aalborg University, Denmark, http://www.plan.aau.dk/~enc/AGILE2007/PDF/115_PDF.

Pae, K., R. Ahas & Ü. Mark (eds.) (2006) *Joint Space. Open source on mobile positioning and urban studies*, Tallinn: Positium

Raban, J. (1974) *Soft City*. London: Picador

Renenger, A. (2002) Satellite Tracking and the Right to Privacy, *Hastings Law Journal* 53 (2002), pp. 549–565. View Record in Scopus | Cited By in Scopus (2)

Richardson, T. & O. B. Jensen (2003) Linking discourse and space: Towards a cultural sociology of space in analysing spatial policy discourses, *Urban Studies*, vol. 40, no. 1, March 2003, pp. 7-22

Sandercock, L. (2003) *Cosmopolis II. Mongrel Cities in the 21st Century*, London: Continuum

Scott, J. C. (1998) *Seeing like a State. How Certain Schemes to Improve the Human Condition Have Failed*, New Haven: Yale University Press

Shoyal, N.; Isaacson, M. (2007) Tracking tourists in the digital age, *Annals of Tourism Research*, Volume 34, Issue 1, January 2007, Pages 141-15, Elsevier Ltd, http://www.sciencedirect.com/science?_ob=ArticleURL&_udi=B6V7Y-4MRXBBV-9&_user=632453&_rdoc=1&_fmt=high&_orig=search&_sort=d&view=c&_acct=C000032758&_version=1&_urlVersion=0&_userid=632453&md5=b1e42665bb4565878f7349dad42dd5a2

Simonsen, A. K. ;Bro, P. ; Harder, H. (2007) *The precision of the Lommy Phoenix : Tests in various urban environments*. 2007, Scientific report, Aalbor University, http://vbn.aau.dk/fbspretrieve/13687440/report_precision.pdf

Till, J. (2005) *The Negotiation of Hope*, in Jones, P. B., J. Petrescu & J. Tills (eds.) (2005)

Architecture and Participation, London: SPON, pp. 23-42

Tait, M. & O. B. Jensen (2007) Travelling Ideas, Power and Place: The Cases of Urban Villages and Business Improvement Districts, *International Planning Studies*, vol. 12, no. 2, pp. 107-127

Wates, N. (2000) *The Community Planning Handbook. How people can shape their cities, towns & villages in any part of the world*, London: Earthscan

Ungvári, T. (1979) The Origins of the Theory of Verfremdung, *Neohelicon*, vol. 7, no. 1, March 1979, pp. 171-232