

Mobility from a Public Administration Perspective:

Political history and technological present

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1. Introduction

Mobile citizens attract the attention of government in various policy domains, such as traffic management (Brimicombe & Li, 2009), tourism (Calabrese & Ratti, 2006), emergency services (Gow & Ihnat, 2004) and policing (van Ooijen & Bokhorst, 2012). Governments increasingly use technological surveillance devices, such as GPS and mobile phones to monitor and control this mobility (van Ooijen & Nouwt, 2009).¹ These surveillance technologies enable governments to categorize and classify citizens (2001). Consequently, in a culture of precaution, mobile citizens are more and more treated as a risk to the state and each other (Pieterman, 2008; van Ooijen & Soeparman, 2010). It can be argued, however, that even before the rise of information and communication technologies, which has enabled the above described technologies, information about mobility was already of great strategic importance to states.

This paper aims to understand the contemporary meaning of mobility in the context of public administration. In order to understand this meaning it doesn't suffice to look at technological characteristics of surveillance alone. Government surveillance of citizens' mobility after all is more than just an application of ICTs. It is a government activity based on certain political needs and circumstances. In this paper it is argued that the meaning of mobility for public administration can be understood by looking at two factors: political history and technological present.

First, the political history of mobility is explored by discussing the rise of cartography and the passport. It is argued that the very essence of the state is largely determined by the demarcation of its territory and the people belonging to this territory. Consequently, mobility is conceptualized according to its historical significance for states.

¹ In the author's dissertation, which is forthcoming in 2014, the concept of public mobility surveillance is elaborated further.

Secondly, the technological present of mobility is discussed. In addition to the historically developed value of mobility for public administration, its significance in present day is largely determined by the interpretation of the mobility data produced by surveillance systems. Taking Bennett en Regan's (2004) conceptualization of mobility as a starting point, a categorization of mobility data is made, showing the variety of possibilities to describe mobility. In addition, the difference between mobility data and mobility information is explored to reveal the importance of the technology and policy context for the evaluation of mobility.

Finally, conclusions are drawn to clarify the meaning of mobility in the context of public administration.

2. Political history of mobility

2.1 Mobility and territorial boundaries

In order to understand why government has developed an interest in information about citizens' mobility, it's important to address the historically grown importance of setting territorial boundaries. Geographer Mark Monmonier and sociologist John Torpey both make a connection between controlling citizens' mobility and defining and guarding territorial boundaries. Monmonier (2010) connects these two developments in his argument about imperative and prohibitive cartography:

Maps exert power in two ways: by shaping public opinion and by telling us where we can't go and what we can't (or must) do in specific places. [...] Whether blatant or subtle, the imperative map is usually intended either to stifle movement or to restrict an activity with a spatial dimension. Examples include aeronautical charts with "no-fly" zones, world political maps, and municipal zoning maps, backed up, respectively, by military aircraft, border guards, and code enforcement officers. [...] Whether the penalty for defiance is explicit or implied, an imperative map is a geographic threat that warns of unpleasant consequences. [...] Because efficient enforcement depends on well-defined territorial restrictions, the primary symbol on most prohibitive maps is the boundary line, underscored perhaps by labels and contrasting colours.

(Monmonier, 2010: 1-2)

To Torpey (2000) the essence of the nation-state is key to understanding the rise of the passport as an instrument of control of citizens' mobility:

[...] the institutionalization of the idea of the "nation-state" as a prospectively homogeneous ethnocultural unit [...] necessarily entailed efforts to regulate people's movements. Yet because nation-states are both territorial and membership organizations, they must erect and sustain boundaries between nationals and non-nationals both at their physical borders and among people within those borders. Boundaries between persons that are rooted in the legal category of nationality can only be maintained, it turns out, by documents indicating a person's nationality, for there is simply no other way to know this fact about someone. (Torpey, 2000: 1)

Apparently, both maps and the passport have been of great significance for determining boundaries and the related need to control mobility. First, the history of cartography against the background of the rise of European states and the determination of boundaries is discussed. Secondly, attention goes out to the passport as an instrument to control territorial boundaries and citizens' mobility.

2.2 Cartography and territorial boundaries

Black (2004, p 31) indicates that a shift in the perception of borders slowly started taking place in the fifteenth century. It was discovered that maps provided the possibility to think of frontiers in terms of lines instead of zones. It wasn't until the start of the seventeenth century though that European rulers really started to get interested in obtaining accurate maps of their territories. Henry IV of France in 1607 appointed royal land surveyors in order to map all border and coastal lines. At that time in France political power had become more centralized as a result of three processes (Clark, 1995: 34). First of all, the French monarchy had expanded its territory of rule. Secondly, the royal authority had strengthened at the expense of the church and local nobles. The third, and with regard to maps the most interesting development was the decline in the geographical mobility of French Kings. On the one hand it had become impossible to personally visit all areas of the expanded territory. On the other hand they no longer needed to do so, because food could become more easily available. Because *La France* was ruled from a central residence, either in Paris or Versailles, it is likely that the king had to find new ways to keep an eye on his territory. Cartography made this possible. State rulers assigned cartographers to map their territories and especially the exact location of the state borders. These maps started playing an important role in diplomatic negotiations and disputes. From this time on it became more common to enclose maps as part of treaties. In the Anglo-Dutch treaty of 1718 a map delineated the frontier between the United Provinces and the Austrian Netherlands. (Black, 1997: 16). In the eighteenth century cartographic activities became part of state culture.

In the course of the eighteenth century more accurate maps emerged and replaced the former ones because of an improved measurement of longitude which could now be combined with triangulation. From this period on, maps were no longer mere illustrations or decorations but turned into instruments that both displayed power and actively supported it. The perceived importance of maps is demonstrated by the founding of state topographic institutes both in France and in England. In the French Revolutionary and Napoleonic period major shifts took place with regard to internal French and European borders. This new imposed reality was given form by mapping the new jurisdictional-territorial criteria. This development also stimulated France's enemies, such as Britain to start up mapping projects. Governments gained control over map making activities by imposing regulation. From 1773 on, for the construction and maintenance of British roads, law imposed the making of maps. In 1791, the British Ordnance Survey was founded because:

The Government realised that in planning adequate defences to repel any invasion, the South Coast of England needed to be comprehensively and accurately mapped. So it instructed its Board of Ordnance – the defence ministry of its day – to speed the necessary survey work.

(Ordnance Survey, 2007)

Towards the end of the eighteenth century cartographic activities had become more and more state-controlled and more mapping was ordered by the state.

At the beginning of the nineteenth century it had become unthinkable to engage in state politics without using maps. States create maps and maps create states. Maps visualize political-geographical relations and shape them at the same time. Recording boundaries onto a map sometimes is more of a creation of political reality than a display of it. Colonial rulers, for example, used maps to stake their claim to African lands: ‘That maps drawn up by diplomats and generals became a political reality lends an unintended irony to the aphorism that the pen is mightier than the sword’ (Monmonier, 1996: 90). In the course of time maps have proven to be important information sources about the world. At the same time, they constitute a mechanism to organize that same world. Borders on a map indicate until where reaches the legitimate power of a state. Consequently, these borders constitute the limits for certain rights and obligations for the people who enter the territory or find themselves already there. This is the imperative cartography Monmonier has put forward.

2.3 Territorial boundaries and the passport

Torpey (2000) demonstrates that early modern Europe's absolute rulers' interest in the coming and going of citizens was mainly based on economic and military motives:

The mercantilist policies pursued by these states entailed the general presupposition that population was tantamount to, or at least convertible into, wealth and military strength. Accordingly, these rulers had a powerful interest in identifying and controlling the movements of their subjects. (Torpey, 2007: 61)

Originally, rulers focussed on regulating the mobility of people within their empires. Only in the nineteenth century, once capitalism and the nation state had triumphed, this focus shifted towards the external borders.

Torpey (2007: 52) states that ‘modern states, and the international state system of which they are part, have expropriated from individuals and private entities the legitimate “means of movement”, particularly, but by no means exclusively across international boundaries’. In fact, Torpey makes clear that states have appropriated the right to regulate the mobility of their own citizens and those of other states. Identification documents, and especially the passport, have been introduced to measure the mobility of (domestic and foreign) citizens (who go in and out of the territory) and manage (who are allowed in and out of the territory). It may be clear that the regulation of mobility between territories is conditional upon the (cartographic) definition of territorial boundaries. The connection between defining boundaries and monitoring movements

across these boundaries goes beyond this point. Again, Torpey (2007: 53) is cited here: ‘states’ monopolization of the right to authorize and regulate movement has been intrinsic to the very construction of states since the rise of absolutism in early modern Europe’. Both the definition of boundaries as the regulation of mobility are inextricably tied to the essence of the state.

The process by which states monopolized legitimate mobility took hundreds of years. This process was parallel to the change in orientation from the local to the national level. This shift, again, took place at the same time of the development of 'national' states having their own citizens. The increasing regulation by the state of mobility went hand in hand with the redefinition of the essence of the state. With the rise of the nation state, the notion of *where* is the state is supplemented by a notion of *who* is the state. No longer was the state solely defined as a territory, but also as a national community.

The introduction of the passport supported the new relationship between state and citizens which accompanied the rise of the nation state. Torpey (2007: 57) speaks of the state embracing society: ‘...“surrounding” and “taking hold” of their members -individually and collectively- as those states grow larger and more administratively adept’. The passport belonging to a particular state is the formal proof of membership of the community of that state: the proof of citizenship. Consequently, Torpey argues that the registration - and therefore acknowledgement- of citizens, belonging to this embracement, enable state to survive by securing income and revenue from society. At the same time, including a group of people implies excluding others from making an appeal on state facilities. On the one hand, the passport is an expression of citizenship, on the other it facilitates the interpretation of citizenship as a status a person can or cannot have. Citizenship can be described as: ‘both a set of practices (cultural, symbolic and economic) and a bundle of rights and duties (civil, political and social) that define an individual’s membership in a polity’ (Isin & Wood, 1999: 4). The notion of citizenship being a status to which a collection of rights and obligations is applicable, can be executed because the passport registers a person's identity. Within their own state territory for most citizens it is clear which rights and obligations they have. In a foreign territory, this is less sure. As a tourist, temporary worker or fugitive different rights and obligations apply than for state citizens. A 'visitor' has a different status. A person's status, thus, is determined by both of which community he is a member, and in which territory he finds himself. Consequently, someone can change his status by travelling to another territory and/or joining another national community. The introduction of the passport has provided states with the means to keep certain people within the state borders, to remove others from the territory, to deny access or to welcome.

2.4 Conclusion: mobile citizens as resources and threats to the state

Both Monmonier’s (2010) concept of imperative cartography and Torpey’s (2000) discussion of the rise of the passport as the legitimate means of movement reveal a connection between controlling people’s mobility and defining and guarding territorial boundaries. Ever since the rise of the states, governments have been concerned with defining their territories, protecting the

existing resources and attracting new resources. As such, from a historical point of view it is essential for the self-preservation of the state to know where the increasingly mobile citizens and non-citizens are and to control where they can and cannot go. Consequently, mobility can be conceptualized in terms of a potential threat or resource to the territorially organized state. Moving from past mobility to mobility in present day, it becomes clear that surveillance technologies allow governments to think of mobility in terms of data and information. Consequently, the potential threats or resources mobile citizens pose to the state can be seen in more detail and may even be redefined.

3. Technological present of mobility

3.1 Social and spatial mobility

The concept of mobility has both a sociological and a spatial meaning. Both meanings can be found, either separately or interwoven in literature about mobility and technology. Soenens (2006: 34) states that social mobility indicates changes in a person's socio-economic status, such as the movement from one social group to another. Both individual efforts and demographic developments can cause these kind of shifts (Soenens, 2006: 34). Technological developments may also be of influence on social mobility:

With e-mail and texting, we are more able to maintain large, spatially separated networks that can be key to social and other mobilities [...] traditional class structures and the barriers they imposed have been dismantled. Access to information has also meant that traditional gender-based structures that result, for example, in inequalities of jobs and pay and the notorious 'glass ceiling' in the promotion of women employees are also being chipped away.

(Brimicombe & Li, 2009: 16)

Discussions about the relationship between technology and mobility, however, focus more often on spatial than social mobility. Geser (2004), for example, mentions that 'wireless transmission technologies are certainly at the root of all innovations that make communication compatible with spatial mobility'. In academic literature, as in daily speech the adjective 'spatial' is usually omitted. Authors simply use the word mobility when meaning spatial mobility (see Bennett and Regan, 2004; Soenens, 2006). When social mobility is the topic at hand it usually is being referred to as such. In this paper the term mobility is used accordingly. Then, what is (spatial) mobility? In their discussion of surveillance and mobility Bennett and Regan (2004: 451) indicate that movement is the essence of mobility. Consequently, the authors present a two-dimensional typology of mobility, consisting of the object of surveillance and the movement itself.

3.2 Mobility as a two-dimensional concept

Dimension 1: the object of surveillance; what is moving?

The first dimension concerns the question: 'what is moving?'. According to the authors, this first dimension of mobility points to the object or objects of surveillance. Within this dimension Bennett and Regan (2004: 451) distinguish three categories: body (a person), transaction (things the person does, either a physical act or as recorded in data), and artefact (object associated with the individual). What kind of data are involved in each of the categories?

Artefacts usually have a unique characteristic by which they can be recognized. A motor vehicle, for example, has a license plate. A public transport chip card has a chip number and a mobile phones' SIM card² has a unique number as well. However, a unique identifier isn't always required. In some policy situations it suffices to have knowledge of the amount of artefacts present at a particular place and time. In that case, it is irrelevant to know which devices exactly are involved. Body data may also vary in specificity. Data on unique identity traits may be gathered. Examples are a person's name, social security number, or face measurements. Another possibility is to detect group characteristics, such as age or gender. It is also possible to detect a person's or group's presence anonymously. The answer to the question 'Who were at location x?' would for example be 'ten persons'. Transaction data involve a person's situational identity. This situational identity depends fully on the (supposedly) performed activities and their policy relevance. Is someone going to break in to a home at time t and location x? Was someone driving a car at time u and location y? Burglary and car driving then are the relevant object data. Which persons can be matched to a particular transaction is another category of object data: body data.

Object category	Shape	Examples
Artefact	Device data	SIM-card number; chip card number
Body	(Aggregated) personal data	Name; age; gender
Transaction	Situational identity	Car driver; victim; witness

Table 1 Object data

The conceptualisation of the surveillance object as an artefact, body or transaction is meaningful, but does raise some questions when trying to use it for analysis. It is rather ambiguous what is the object of surveillance in a particular situation. For example, when the police request mobile phone location data in the context of murder investigation, what exactly are the objects of surveillance? Are these the mobile phones (artefacts), are these the mobile phone users (bodies) or are these witnessing or committing a murder (transactions)? The mobile phones could be considered as the objects of surveillance, because the police collect data about the phone devices. 'Mobile phones', then, would be the answer to the question 'what is moving?'. This answer,

² SIM stands for Subscriber Identity Module.

however, is not satisfying when considering that the police aren't really interested in the phones, but more so in the people who were present in the vicinity of the crime scene around the time of the murder. For that reason, the people using the mobile phones could be viewed as the objects of surveillance. However, in the described situation, the police don't actually gather data about bodies (which would have been the case if they were to use CCTV images). The third option, the transaction itself, could also be seen as the object of surveillance when considering that in this case the goal of mobility surveillance is to obtain information about the murder. The distinction between data and information may further our understanding of the concept 'object of surveillance'.

Brimicombe & Li explain the relation between data and information:

A datum is a fact, often in the form of measurement or as an indication that something is perceived to exist or has occurred. *Data* are thus collections of facts – the building blocks of information, evidence and knowledge. *Information* is something about which we are informed (have communicated to us – or become known to ourselves) usually as a result of analysing or interpreting data. Information is often (should be) the basis for rational decision making.

(Brimicombe & Li, 2009: 137)

It thus depends on the specific context which information is obtained from which data, and which decisions are taken based on this information. For example, the Dutch national railway company NS may match personal data from their client files to location and time data obtained from public transport chip cards. Consequently, the NS obtains information about travel behaviour resulting in the decision to send information to a particular group of clients.

The use of the public transport chip card furthers our insight in the use of our trains and products. We use deduced travel data, such as frequency of travel, preferred stations – and trajectories, time passed since your last journey, and whether you travel during or outside rush hour for purposes of relations management and to inform you about relevant services and products.³ (NS, 2010)

In a different context the same data may lead to different information and a different decision. The police of the city of Rotterdam have used public transport chip card data to track down assault witnesses (van 't Hof, van Est and Daemen, 2010). What, then, does the distinction between data and information tell us about the object of surveillance?

The answer to the question 'what is moving?' can thus be given at three levels of surveillance. The first level of surveillance involves data collection. This level provides a description of the object which is actually being detected. In the earlier example of the murder case, these objects are the mobile phones. In the public transport case the public transport chip cards are the objects. Data matching is the second level of surveillance. At this level, the object which is being referred to already exists in one or more databases. Its data are linked to the data acquired at the first level

³ Translated by the author

of surveillance. In the murder case these are the people who, according to the telecom providers databases are the users of the localized telephone numbers. In the second example, these are the registered users of the selected public transport chip cards. Finally, the third level at which the object of surveillance can be described is data analysis. At this level the object concerns one or more possibly overlapping categories of people, which are specified according to the policy context in which the data acquired at level one and two are interpreted. In the first example, this involves categories of people which are relevant to solving a murder case, such as perpetrator and witness. The public transport case has already shown that, dependent on the policy context, the same data can lead to different information. As such, the object of surveillance in the public transport context can be defined as ‘frequent traveller’ and ‘frequent user of station x’. Table 2 shows the connection between the three levels of surveillance and the three object categories.

Surveillance level	Object category	Example 1 – Murder case	Example 2 - Travel behaviour
Data collection	-artefact -body	Mobile phone	Public transport chip card
Data matching	-body	Mobile phone user	Public transport chip card user
Data analysis	-body -action	Witness / suspect	Frequent traveller

Table 2 The object of surveillance: what is moving?

As can be seen, not all object categories are relevant at all surveillance levels. Artefacts, such as mobile phones, chip cards or cars will only be the object of surveillance at the level of data collection. Bodies, on the other hand, prove to be a relevant category at all three levels of surveillance. People can, for example, be perceived directly by means of CCTV cameras (level 1). Next, registered data, such as name or age can be matched to the data generated by the CCTV-cameras. At this level, the identity of the surveillance object is (partially) established (level 2). Finally, bodies can be the object of surveillance at the level of data analysis. This is the case when the goal of surveillance is to visualize the mobility of a particular person or group with certain characteristics (level 3). When people are selected for data analysis based on their transactions, rather than their personal traits, the transaction is considered as the object of surveillance.

Dimension 2: the movement itself

The second dimension of mobility is the movement itself:

This is a more complicated concept because one is trying to capture something that is by definition in motion, either, as Clarke states, from place A to place B, or from time 1 to time 2, or in relation to the movement of the earth. Thus we propose that mobility should not be viewed in terms of static categories but instead is more appropriately regarded as a continuum.

(Bennett & Regan, 2004: 451)

Bennett and Regan's perception of mobility as a continuum can be connected to Manuel Castells' theory of the space of flows: 'our society is constructed around flows: flows of capital, of information, of technology, flows of organizational interaction, of images, sounds, and symbols' (Castells, 2000: 442). By ingeniously defining the space of flows as 'the material organization of time-sharing social practices that work through flows' (Ibid.) Castells sheds light onto the social meaning of place and time. The logic of the space of flows says something about place and time. At the same time, place and time are a starting point for gaining more insight into flows. Despite Bennett and Regan's reserve, a specification of the second dimension of mobility, the movement itself, seems both possible and meaningful. Just as social mobility, spatial mobility is about movement and change, but in reference to people's place and time.

Movement in the dimensions of space and time is also called translocation. Mobility always points to this kind of movement, or at least the possibility hereof. If I move from location A to location B, I'm mobile, but I don't actually have to make the movement in order to be qualified as such. As Soenens (2006: 35) confirms, the fact that I'm able to translocate, already makes me mobile 'Related to mobility, 'mobile' refers to something that is able to move, so it is the opposite of 'static'. The double meaning of 'mobile' as 'moving' and 'able to move' can also be found in Roger Clarke's conceptualisation of 'mobile'. Clarke (2003) mentions four characteristics of which a device can have one or more, which would make people call it mobile. The first characteristic is *the ability to move in space and time*: 'devices may be 'mobile' in the limited sense of *being able* to be in a different location at any given time from that in which they were at one or more previous times'. Secondly, the term mobile can point to *insecurity about the current location*: 'a device might be in any location from which transmission to another device is possible'. A third meaning of 'mobile' is *being on the move*: 'a further interpretation of 'mobile' is in the more substantial sense of currently moving relative to the earth's surface, but nonetheless capable of sustaining data transmission, e.g. as a passenger in a plane, a train, a taxi, or a car, or, less safely, as the driver of a car'. Fourthly, a device can be called mobile when it is *easily movable*: 'yet another sense of the term 'mobile' is to refer to devices that are designed to be easily and conveniently portable, and to rely on wireless transmission, possibly to the extent that they do not support cable-based connections'. Evidently, 'mobile' has several meanings. At the same time Clarke's four characteristics are very much connected. The first characteristic, the ability to move in space and time, is a condition for the other characteristics. If something cannot move it will never be qualified as possibly anywhere, in motion or easily movable. Therefore, the

essence of mobility is an object's *ability* to move in the dimensions of space and time. As such, mobility refers to both not-moving and moving people. Whether a person translocates, and if so, where and when he does, is information which can be obtained by using surveillance technologies. Next to data about the surveillance object itself, data about the object's location and time have to be collected in order to generate mobility information.

The meaning of place is not always clear. When a question is posed about a place, it always involves 'where' in relation to something or someone. Where is Mister Johnson? Where is the car with license plate xx-yy-11? What are possible answers to a question of place? What can be 'where'? 'Where' usually refers to a location in the physical world (Küpper, 2005: 17). Küpper (2005: 18) distinguishes three location categories, each of which expresses in a different way where someone or something finds itself on the face of the earth: spatial, network and descriptive locations.

When it comes to a spatial location 'where' corresponds to one unique point, also called position, which is usually displayed by means of two or three-dimensional which refer to the axes or dimensions scientists use to divide the Earth. An example of a spatial location would be H 55m N 51.5629° E 5.0472°. Spatial locations are mainly of importance for professional use such as in the army and shipping business, because one depends on a high precision and accuracy of location information. 'Where' in the category of network locations is displayed according to the topology of a communications network, such as the GSM network or the internet. A communications network, then, is the reference system to express a location. Network addresses contain routing information in order to connect certain numbers or other identifiers to a network address. In a mobile communications network, for instance, the network location depends on the base station a mobile device is connected to. The network location is essential for the service in the communications network. It is, for example, impossible to make a phone call without the network provider knowing where my phone finds itself in the network. The third locations category, descriptive locations, point to the description of a place as given in daily speech. Of course, many variations are possible. What all descriptive locations have in common is their reference to geographical objects. These can be natural objects, such as mountains, rivers and forests, or objects created by man, such as boundaries, cities and streets.

The question ‘Where is person x?’ can be answered in various ways. Table 3 demonstrates the core characteristics of the three location categories.

Location category	Shape	Examples
Spatial	Coordinates	Point in a Cartesian (X,Y,Z) or ellipsoid (N/Z; O/W) coordinate system ⁴
Network	Cell-topology	IP address; place in a GSM network
Descriptive	Geographical reference	Address; name of building/park/city

Table 3 Location categories

Next to object and location data, time data are a third category of mobility data. Time data help to answer the question *when* a person can be connected to a certain location. Besides the question ‘where *is* person x?’ , the questions ‘where *was* person x?’ and ‘where *will* person x *be*?’ are of relevance as well. A distinction is being made between data about the present, the past, and the future. Mobility data about the present involve the here and now. Data about spatial, network or descriptive locations are being gathered in real time in order to get insight into a current situation. However, what does current mean? At the moment when data about a person’s current location become available, the situation may have changed again. From a technical point of view, latency of data is an important aspect: ‘*Latency* refers to the time period between a position request and the subsequent delivery of a position fix’ (Küpper 2005: 126). Latency is influenced by the measurement method and circumstances such as the network load or cloudiness. Based on the definition of latency, we can speak of data about the present when localization takes place immediately after a request for information. Someone wants to know where person x is at that very moment and receives the necessary data within a matter of seconds.

Mobility data about the past imply that localization has taken place before a request for information is being made. In order to be able to obtain these data from the past, something extra has to happen to the real time data in the present. At the moment that real time data are registered in a database, they become historic data. Time can be registered in either an absolute or a relative way (Brimicombe en Li, 2009: 255). Absolute time means a date and time stamp for each location data. This, for example, allows a person to consult a database at time (t) in order to see where person x was at times (t-1; t-2...t-z). Relative time means the amount of time that has passed since an arbitrary starting point. As such, a person’s travel time between locations A and B can be registered (for several occasions in the past).

It is (yet) technically impossible to gather future mobility data. There are no detection methods to assess with a certainty of 100% where person x will be at time t. The fact that data about the future are not yet available, however, doesn’t inhibit the possible creation of information about the future. Based on available data about the past, the future can be calculated. Like weather

⁴ See Küpper (2005: 20-23) for a detailed description of both coordinate systems.

forecasts, mobility forecasts are more accurate when they're closer to the present. A big difference between forecasts about mobility and those about the weather is that mobility concerns human movements instead of natural elements. Therefore, predicting mobility implies predicting human behaviour, which depends on more than laws of nature. The question ‘When is person x?’ can thus be answered in various ways.

Time category	Shape	Examples
Present	Data gathered in real time	Current location of fugitive wearing GPS ankle bracelet; location of 112 emergency call
Past	Saved data	Historic traffic data; public transport chip card journey time data
Future	Calculated data	Expected traffic jam; Terrorism threat

Table 4 Time categories

3.3 Conclusion: mobility as data and information about movement

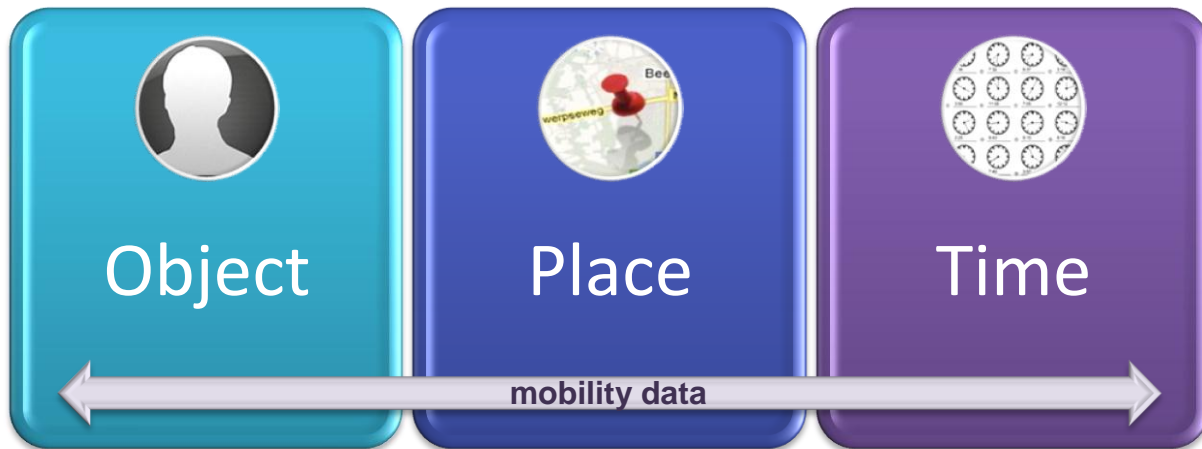


Figure 1 Mobility data

This section on the technological present of mobility has revealed that mobility consists of two dimensions: the (possibly) moving object of surveillance and the movement itself. Consequently, three categories of mobility data have been distinguished, as displayed in Figure 1. Data about the object of surveillance help answer the question ‘What is moving?’. Three answering categories are distinguished: artefacts (e.g. mobile phones), people (e.g. Mister X or men), and actions (e.g. potential burglars). Which answer or combination of answers are given in a particular situation depends on both the technological characteristics of the surveillance system in use and the specific policy context. Data about the movement itself consist of location data (place) and temporal data (time). Here, it is important to be aware that in order for an object to be

called mobile it isn't necessarily moving in the dimensions of space and time. The very ability and possibility to move is the essence of mobility. The concepts of spatial, network and descriptive locations help to understand potential movement in the dimension of space. Time can be understood in terms of information about the past, present or future. Because there is room for variation in all three categories of mobility data, mobility information will manifest itself differently dependent on the specific policy and technology context. Consequently, decision-making based on mobility information is influenced by the characteristics of the mobility data as well.

4. Conclusion

This paper has shown that the meaning of mobility, and more specifically mobile citizens, for government is determined by both its political history and its technological present. From a historical point of view the increasing mobility of people has proven to be a double-faced challenge for the state. When at the time of the rise of the nation state the notion of *who* is the state was added to the notion of *where* is the state to define the essence of the state, states learnt to perceive mobile people as a resource on the one hand and as a possible threat on the other. This perception of mobility finds its roots in states' actions for self-preservation through the definition of borders and the drawing of maps. This historically grown meaning of mobility to the state has left its mark on the way government deals with mobile citizens today. Contemporary government, however is better equipped to monitor and control mobile citizens than in its early days. At the same time the currently available surveillance technologies influence the way government perceives mobility by providing the possibility to categorize people in a most detailed way.

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