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Risk and Approaches to Risk-Taking in Testbed Planning

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ABSTRACT

Urban experimentation and testbed planning have emerged as a response for developing solutions to contemporary urban challenges and constitute designated spaces of risk-taking. They represent strategic attempts at reimagining, influencing and even altering urban futures through the specific focus of being open to surprises and the unexpected. The aim of this article is to conceptualize risk in testbed planning and analyze risk and urban planning approaches to risk-taking. By using mobility experiments in five Nordic municipalities, it is shown that three approaches to risk prevail with regard to different loci of risk in testbed planning. These three approaches are minimizing and shifting responsibilities for individual risk, minimizing and shifting organizational risks and refusing political risks.

KEYWORDS

Risk; risk-taking; urban experimentation; urban planning; testbed-planning

Introduction

Urban planning is increasingly under pressure to become more innovative and efficient in the ways in which it delivers public services and functioning living environments (Savini, 2017; Timeus & Gascó, 2018). Urban experimentation has emerged as a response to such pressures, but also as a means for pursuing radical transformation to sustainability (Fuenfschilling *et al.*, 2019). The transition to sustainability is considered as having to include increased risk-taking in the face of uncertainty through the call to break with the status quo and ‘business as usual’ (Bulkely & Castán Broto, 2013). Urban experiments constitute designated spaces of risk-taking and represent strategic attempts at reimagining, influencing and even altering urban futures through the specific focus of being open to surprises and the unexpected (Karvonen *et al.*, 2014; Evans, 2016). They are conducted in a range of areas, from transport to energy efficient housing, with the common goal of sharing knowledge to facilitate policy learning, including scaling up and disseminating results with the ambition to generate so called ‘system change’ (von Wirth *et al.*, 2019). Risk in urban experimentation is associated with positive possibilities (Brown & Osborne, 2013), rather than risk in traditional urban planning, which is associated with something negative that needs to be managed (Zandvoort *et al.*, 2018). As urban experimentation is governed by prioritizing risk-taking and radical change, it stands in direct conflict with the modernist foundational premise of urban planning: to provide predictability and long-term stability (Berglund-Snodgrass & Mukhtar-Landgren, 2020;

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cf. Agger & Sørensen, 2018). The term testbed planning is employed in order to conceptualize these processes that emerge in the intersection between urban experimentation and urban planning, and is defined as a collaborative planning process in a geographically delimited area that has the ambition of generating and disseminating learning, while simultaneously developing the site (Berglund-Snodgrass & Mukhtar-Landgren, 2020). In these processes, actors and stakeholders determine approaches to risk in a collaborative manner. Different actors have in turn different agendas and stakes in risk-taking (e.g. financial, political, professional) (cf. Blok, 2018), but also differing perceptions of responsibility (cf. Andreeva *et al.*, 2014). For example, urban planners distinguish themselves from other actors in these processes in their democratic and moral responsibility for responsible public spending (Bhatta, 2003) and providing just and well-functioning public services and living environments (Vigar *et al.*, 2020). There are, thus, expectations on local governments to intervene and govern the risk that in various ways are considered to affect society, and '[o]ur trust in authorities is affected by their ability [to do so]' (Andreeva *et al.*, 2014). These planning processes can be organized in different ways, within the traditional bureaucratic organization or in fuzzy 'soft spaces' outside the hierarchical organization of local government and associated accountability structures (Allmendinger *et al.*, 2016). In collaborative planning, urban planners and stakeholders are brought together in dialogues concerning use and function of space (Healey, 1997; Ansell & Gash, 2008). We know that these dialogues may comprise conflict ridden negotiations concerning, for example, land use and property value (Zakhour & Metzger, 2018) and that urban planners tend to suffer from weak negotiating positions vis-a-vis private developers (Savini, 2017; Zakhour & Metzger, 2018). As the relationships are dynamic, where each actor negotiates and tries to influence other actors' actions, it is unclear how responsibilities for risks are distributed (Andreeva *et al.*, 2014). Like other collaborative planning processes at large, urban experimentation may open an opportunity to reorganize and shift responsibilities for risk between actors (cf. Savini, 2017; Tasan-Kok *et al.*, 2019). An assumption being made here is that alternative approaches to risk always are possible and that planners can employ different strategies to risk in testbed planning. But what are the risks at stake in these experimental processes? Do urban planners adopt different strategies for different types of risk? The overarching purpose of this article is to explore risk and approaches to risk-taking in testbed planning processes. The following two research questions organize the study: What risks prevail in processes of testbed planning, and how are urban planners approaching such risks? These questions will be embarked upon in a multi-sited case study analysis of risk and approaches to risk-taking in Nordic testbed planning processes.

This article is organized into five sections. Following this introduction, the next section introduces risk as well as a theoretical horizon of different loci of risk in testbed planning. This is followed by a section where the empirical material will be introduced, comprising urban mobility experiments in five Nordic testbed planning processes, as well as the structure for analysis outlined. Section four analyzes risk with regard to different loci of risks, as well as the ways in which they are approached in testbed planning processes. The article finishes by concluding that urban planners are reluctant to take any risks in testbed planning and calling municipalities to develop comprehensive risk-taking strategies if they are serious about pursuing urban experimentation as a means for achieving sustainability.

Introducing Risk in Testbed Planning

What is risk? In the traditional urban planning context, risk tends to be referred to as ‘the probability that an undesired but previously identified outcome materializes’ (Renn, 2008; Brown & Osborne, 2013). This understanding of risk resonates with the public sector focus on minimizing risk to the extent possible to avoid damage (Renn, 2008; Osborne *et al.*, 2020). Risk can also be referred to as ‘a future event which may or may not occur and which may have positive or negative consequences’ (Ansell & Wharton, 1992 in Andreeva *et al.*, 2014). This definition resonates more with the urban experimentation literature and opens up the approaching of risk in both a negative and positive fashion, while bringing forward the uncertainty of outcomes. In the innovation and urban experimentation context, risk tends to be approached from the perspective of possible *positive* consequences – risk is considered as having to be taken to ensure benefits (Osborne *et al.*, 2020). Here, the idea of taking risk includes exposing individuals/society or organizations to the possibility of both negative and positive outcomes (Garcia-Granero *et al.*, 2015). What is valued as ‘negative’ or ‘positive’ is in turn connected to what society currently values and attributes importance to (Renn, 2008; Osborne *et al.*, 2020). It may be the economy or individual integrity. Such a point of departure recognizes risk as socially constructed and as existing within a knowledge relationship, one in which our society’s understanding and valuing of reality plays a direct role in constructing and reproducing risk (Gunder, 2008; Sørensen, 2018). What is included as risk in testbed planning processes thus reveals societal concerns and values, e.g. relevancy claims – what matters to society (people or organizations), and normative claims – what is acceptable or tolerable? (Renn, 2008). Furthermore, the societal and organizational circumstances for risk may influence what people or organizations perceive as acceptable (e.g. climate crises, innovation, austerity) (Renn, 2008). It may, in other words, be socially acceptable to some organizations to make decisions that include risk-taking when it comes to the perceived urgency of developing knowledge for mitigating the climate crisis. Similarly, innovation may comprise circumstances which render certain public sector risk-taking acceptable. What may be included as acceptable risk also recognizes that there is a perceived equality and justice with regards to the distribution of benefits and risks (Renn, 2008), e.g. that particular publics are not only risk-bearers but also the groups that will receive the possible benefits or positive consequences (Andreeva *et al.*, 2014). Since risk becomes a core issue to resolve in processes of urban experimentation, one initial question to pursue is that of what types of risks are actualized in testbed planning processes? Brown and Osborne (2013) bring forward that risk in public sector organizations concerns whether ‘... *the new service, good or process, together with its local adaptations, [will] deliver its intended outcomes – and will it be accepted by service users, the media, politicians and/or the public?*’ Highlighting that there are different loci of risk in such processes. In this article, these will be referred to as *individual*, *organizational* and *political* loci of risks. By using this typology as an inspiration and a point of departure, risks that are identified in the broader literature on smart city, innovation and urban experimentation will be outlined in the following section and organized under these three loci of risk. This typology will operate as a theoretical horizon (cf. Berglund-Snodgrass, 2017) of risk in testbed planning.

Individual Loci of Risk

Individual loci of risk constitute risks that in various ways are perceived to impact adversely upon individuals in society (Brown, 2010; Brown & Osborne, 2013). Here, experiments with new, so-called, smart-networked digital technologies for delivering public services may comprise to a high degree *technological* risks coupled to security vulnerabilities, such as weak software security, data encryption or maintenance protocols, which in turn may present direct risks to the *personal integrity and privacy* of individuals (e.g. revealing, appropriating and aggregating sensitive data) (Galdon-Clavell, 2013; van Zoonen, 2016; Vitunskaitė *et al.*, 2019; Ismagilova *et al.*, 2020). Or they may risk the stability of public service delivery, which impacts the daily lives of individuals (e.g. disrupting bus-services) (Kitchin & Dodge, 2017). Kitchin and Dodge (2017) point to examples of cyber-attacks on toll-roads that disrupt traffic flows for a long period of time or on rail networks where ticket machines are removed from service for several days. Such experiments may also present risks to people's general health and well-being (cf. Brown & Osborne, 2013). For example, cyber-attacks on one city's tram switches in Poland caused four trams to derail, injuring several passengers (Goodman, 2015 in Kitchin & Dodge, 2017). Urban experimentation with autonomous vehicles in urban settings introduces yet another layer of technological risk affecting individuals' safety, including crash algorithms that determine life or death situations during inevitable accidents (Taeihagh & Lim, 2019). Next to technological risks sit risks coupled to financial investments in urban development. As urban experimentation comprises spaces of targeted private sector investments in, for example, urban infrastructure (e.g. energy grids, mobility services), it opens up possibilities for new technologies to generate new markets with individual responsibility for energy production and consumption, risking 'inequalities not just within housing districts or between neighborhoods, but in everyday consumption, lifestyle and leisure activities' (McLean *et al.*, 2016). Urban experimentation may consequently comprise a number of perceived risks for the individual, such as fiscal, privacy and integrity risks, but also risks for the right to equal access to public services and utilities.

Organizational Loci of Risk

Organizational loci of risk constitute risks to organizations and/or risks to the legitimacy of their associated methods and practices, comprising both reputational risks and legal liabilities, as well as risks of failing to meet political goals or performance targets. Urban experimentation may comprise the introduction of new approaches to addressing existing needs (Brown & Osborne, 2013), e.g. new—perhaps unorthodox—planning approaches for addressing sustainability challenges. As urban experimentation comprises designated spaces for collaboration between local governments and corporate stakeholders (Raven *et al.*, 2019), in which selected private actors are granted exclusive access to decision makers, public land and infrastructures to test and experiment (McLean *et al.*, 2016), it opens up a number of organizational risks coupled to liability and trust in democratic institutions such as urban planning, but also to the maintenance of the institution itself. Processes of urban experimentation risk, for example, undermining the normative values of traditional urban planning, e.g. representing an *anti*-approach to

public sector regulatory planning (Savini, 2017; Cowley & Caprotti, 2019), and undermining the rationality of public interest as a basis for intervening in the built environment (Morgan & Webb, 2020). In addition, the short-term objectives of urban experiments risk increased pressure on city budgets to cope with unexpected future costs (Savini, 2017). Urban experiments comprise processes of setting up temporary project organizations that may not be mainstreamed and which require energy and resources from both professionals and civil society, which in turn may not only risk public finances but also the endurance of civil servants and citizens (project fatigue) and citizens' *trust* in civil servants and public institutions (Brown, 2010). In addition, civil servants may misinterpret and rationalize their own professional interest and motivation for partaking in urban experimentation as that of the public, and consequently 'make changes that may not be necessary, appropriate, or in the public interest; and undermine the norms and values that are important to constitutional democracies' (Bozeman & Kingsley, 1998). Thus, risking not only the legitimacy of public organizations but also that of democracy.

Political Loci of Risks

Political loci of risk concern risks to politicians and local democracy, and/or their legitimacy. This may concern risking political stability, their reputation and legitimacy, but also risking democratic anchoring and accountability. Urban experimentation appears, for example, as a contested matter among certain publics (cf. Morgan & Webb, 2020; Carr & Hesse, 2020), which opens up spaces of public disputes around the focus on scientific and corporate knowledge and 'best practice' in such endeavors, calling upon politicians to make decisions in the interest of the citizens and not only to the benefit of corporate stakeholders in urban experimentation (Frenken *et al.*, 2019; Morgan & Webb, 2020). Urban experiments herein comprise political risks with regard to the legitimacy of local democracy and 'the right to the city' (Evans, 2016), risking that 'society becomes a laboratory, but there is no one responsible nor held accountable for its outcomes' (Flemig *et al.*, 2016; von Wirth *et al.*, 2019). Additionally, urban experimentation may also risk financial capital, e.g. the constituency's tax revenues. Processes of urban experimentation in testbed planning may present opportunities for media and public scrutiny of the use of tax-payers' money and contribute to risking political reputations (e.g. bad press coverage) (Osborne *et al.*, 2020).

Having now set out a theoretical horizon of three loci of risk based on the broader literature on smart cities, innovation, and urban experimentation, we will now direct attention to what risks can empirically be discerned in processes of testbed planning. This will tell us something about what is currently considered important and subject to some form of risk-strategy in these processes (cf. Renn, 2008). We will also direct attention to the ways in which risks are considered and approached by urban planners and intermediary actors in testbed planning processes, processes in which risk-taking is considered integral. But first, a brief outline of the empirical material and overall structure for analysis.

Brief Outline of Empirical Material and Structure for Analysis

This article draws from an in-depth, multiple case study (Yin, 2014) which allows for the investigation of testbed planning processes across multiple settings to gain a deeper understanding of what risks are elevated in such processes, as well as how these risks are considered and approached by urban planners and intermediary actors. To be seen as examples of testbed planning, the cases should comprise an on-going urban experiment in a geographically delimited testbed site. A testbed is defined as a delimited geographical site of urban development, in which experiments constitute an integral part of planning and developing the area. Five testbed planning cases are selected from the three Nordic countries of Sweden, Denmark, and Finland that all share a similar tradition of a decentralized state and strong local autonomy (Loughlin, 2000). Nordic planning systems are characterized by a comprehensive planning model and urban planning constitutes primarily a municipal affair (Fredricsson & Smas, 2015). The on-going experiments in the cases are different but can all be said to be included within the broader scope of sustainable and smart mobility. Smart mobility is a concept associated with a variety of socio-technical interventions, such as intelligent infrastructure, automated, connected, and electrical vehicles, combined mobility services and new forms of sharing-based services and other ways of providing access without traveling (Wallsten *et al.*, 2021). This study includes a broader selection of mobility experiments to also include policy-oriented urban experiments that seek to accomplish behavioral changes of the ways in which we travel in cities (i.e. changing car dependence) by granting developers the right to deviate from existing car parking regulations in new developments (cf. Gunnarsson-Östling, 2021). The objective for incorporating a broad variety of mobility experiments is to develop a comprehensive understanding of the types of risks and approaches within the empirical area of mobility in testbed planning. As this article is particularly interested in urban planners' approaches to risk in these processes, interviews and focus-group interviews were conducted with two main types of actors: (1) municipal actors such as urban and transport planners, development managers, coordinators, and engineers, and (2) intermediary actors such as project managers who are engaged in testbed planning processes. An intermediary actor is defined as '[a]n organization or body [or an individual] that acts as an agent or broker in any aspect of the innovation process between two or more parties' (Howell, 2006 as cited in Hakkarainen & Hyysalo, 2016, p. 46). The intermediaries are seen as 'operating between different social interests (and technologies) to produce outcomes that would not have been possible without their involvement' (Marvin *et al.*, 2018). In two of the cases, intermediary actors are situated in partnership organizations – between the municipality and private actors. The partnership organization operates within the overall objective to jointly develop smart and sustainable urban solutions. The cases are summarized in the [table 1](#) below.

The interviews were carried out between September 2018 and May 2021 and concerned questions about how the processes relate to everyday planning activities and tasks but also perceived risks. In addition to interviews, documents were collected, such as official documents (detailed development plans, building permission applications, agreements between public and private actors) and email correspondence between planners and participating actors. The procedure for analysis followed a two-step process. First, risk that can be discerned in the material with regard to the different loci of risk was

Table 1. Overview of the cases.

Planning case/ involved actors	Urban experiments	Empirical material
Case 1: brown field development/ municipality, intermediary actor and private actors	Intelligent infrastructures, combined mobility services	Semi-structured interviews with two intermediary actors, one municipal project leader, one municipal transport planner, one municipal ICT engineer, one municipal urban planner
Case 2: brown field development/ municipality, intermediary actor and private actors	Automated buses	Semistructured interviews with one intermediary actor, one municipal traffic planner, one municipal smart city coordinator, one municipal urban planner
Case 3: densification project/ municipality and developer	Parking norm, so called 'car-free housing'	Focus group interview with municipal urban planners. Project report. Detailed development plan.
Case 4: green field development/ municipality, developer and mobility service providers	Parking norm, so called 'car-free housing' and combined mobility services	Semi-structured interviews with developer, municipal transport planner and mobility service provider. Official documents.
Case 5: brownfield development/ municipality and developer	Parking norm, so called 'car-free housing'	Semi-structured interview with developer, focus group interview with municipal urban planner and transport planner. E-mail correspondence. Building permission application.

coded and delineated. This tells us what values that are currently attributed importance in testbed planning, and which are not. Is, for example, individual integrity raised as a risk in these processes, or is this something that is not deliberated? Here, the theoretical horizon of risk provided in section 2 operated as a foundation for the analysis. Thereafter, it was delineated how urban planners approached the risks considering their possible consequences. The analysis is presented in the following section and is structured in accordance with the different loci of risk. To increase the transparency of the analysis, illustrative excerpts from interviews or documents are provided.

Risk and Approaches to Risk-taking in Nordic Testbed Planning Processes

In the empirical material at large, it is apparent that risk is generally not raised as an explicit element that is subject to specific risk-taking strategies. Instead, the objectives are to improve matters, and as such, the possible negative consequences connected to the activities are seldomly discussed. One respondent states:

the ambition is always to make the people or companies, people, residents of [the housing district] live better with these new tests, so I haven't really talked about risks very much (Case 1, transport planner).

So, on the one hand, risk tends to be approached from a positive point of view, aligned with the logic of urban experimentation. Here, the positive opportunities that may arise through urban experimentation constitute the focus, rather than considering any possible negative consequences. On the other hand, it is apparent that the conditions for risk-taking are considered and deliberated between urban planners, stakeholders, politicians and private actors in different arenas and settings. These dialogues are not always transparent for the citizens and are carried out partly in organizing the conditions for the urban experiments, such as through email correspondence or other forms of communications, or through civil agreements/contracts between the parties including project funding applications.

In the following section, risks that prevail in processes of testbed planning with regard to the different loci of risk will be analyzed and the ways in which they are considered and approached by urban planners and intermediary actors delineated, e.g. such as minimizing or shifting risk. We will go through each locus of risk below and give empirical examples in each category.

Minimizing and Shifting Responsibilities for Individual Risk

One prominent individual loci of risk that is explicitly brought up in the material is technological risk, which is considered as having the potential to negatively impact individual integrity. This risk is primarily raised in connection to urban experiments with smart technologies, such as autonomous buses -- but is raised to concern all smart experiments that use sensors and/or based on data of different sorts in the public realm (traffic monitoring systems, app-based mobility services) (cases 1 and 2). The ways in which this risk is approached in these cases appear to be dependent on the ways in which individuals are considered in the process, as *citizens* or as *users*. When individuals are approached as citizens, the civil servants appear to adopt a strategy of minimizing the risk through means of communications or restrictions. For example, one smart city coordinator stresses the importance of communicating the technological risk to the citizens, since individuals subjected to such a risk is largely unaware of technological risk:

because when you work with technology you just see how it goes very fast, and you see how people don't know what they are saying yes to [...] if we put sensors up in the whole city, I would like our citizens to know that we are doing that, and to maybe have a sticker that says this is a sensor, maybe it's a camera but it can't show your face, this basic communications about these things, because people don't have a clue about them (Case 2, smart city coordinator)

Here the coordinator suggests that citizens to a large extent are risk-bearers when experimenting with smart technologies, and that it is the municipality's responsibility to inform the citizens so that they can make an informed decision as to whether they are willing to take the risk and participate in the experiments. Another consideration of this risk is expressed by one respondent who highlights that the municipality restricts what type of data that can be collected in mobility experiments. This respondent suggests that data of individuals or groups of individuals' movements and undertakings can by no means be collected, as 'it's very important that we don't know what one individual or group of people are doing' (Case 1, transport planner 2).

If instead individuals are considered as *users and testers*, the technological risk appears to be shifted to the individuals themselves to consider. One civil servant states that the people who are interested in being users in the experiments generally don't care about data protection protocols or what type of data is collected:

Well, the people who are really interested in trying new things are usually not going to be too critical about "ok, does this actually use the GPS on my phone"? (Case 1, project leader/coordinator)

Here, it appears that the issue at stake concerns getting access to individuals who are willing to participate as users in the experiments--rather than about protecting their integrity as citizens -- as the planners see themselves dependent upon an adequate

number of users to successfully demonstrate new services or techniques within the city. If this risk is not considered by the individuals themselves, the civil servant does not recognize that he/she should. There also appears to be a perceived difference between urban experiments with new services which rely upon active users that they need to recruit (e.g. testing an app or a mobility service) and urban experiments with data collection which rely upon passive users (e.g. smart traffic monitoring systems), which is considered to best remain invisible to the users, so ‘they won’t annoy residents’ (Case 1, project leader/coordinator). Having a good relationship with potential ‘users’ is of strategic importance to ensure the success of the experiment.

When asked about data management and security protocols, it is generally raised as a responsibility of the actors that own and carry out the experiments. For example, it is highlighted that it would be counterproductive to the municipality’s objective of facilitating a smooth process with innovators to make restrictions for how data should be managed and stored. Urban experimentation appears to be driven by industry actors with competitiveness and economic growth as primary objectives – and not by public values such as safeguarding individual integrity. The municipalities appear, in addition, to have very vague knowledge of how data that is collected in urban experiments are used in any broader sense for example, third-party usage. However, in smart mobility experiments which municipalities own and initiate, the respondents point out that they have their own data management protocols that govern the risk. There appears as such to be a difference as to whether the experiments are run within the hierarchical local government and associated accountability structures or through partnership organizations in ‘fussy’ soft spaces of accountability, similar to the two cases presented above.

The strategy of communicating and informing citizens about risk is also prevalent in the three cases, which include urban experiments with the municipal parking requirement (cases 3, 4 and 5). In these examples, individuals are presented with the risk of not having any access to car-parking infrastructures. The municipality demands that the developer informs the future residents about the parking condition for the housing, making it clear that it is an individual choice to refrain from having access to such infrastructure when participating as users in the experiments. The pilot project becomes ‘life-style housing’ targeting environmentally progressive ‘car-free choosers’ (cf. Melia *et al.*, 2012) and not citizens at large.

To summarize, the material identifies predominantly individual integrity as an individual locus of risk. Planners approach this risk in primarily two ways, by minimizing the risk by means of communication and restrictions, and by shifting the responsibility for the risk to third-party actors or the individuals themselves. The planners appear to be moving between considering individuals as citizens who should be correctly informed about risks and considering individuals as users who should be recruited to participate in urban experiments at their own risk.

Shifting and Minimizing Organizational Risks

When it comes to the organizational locus of risk, predominantly two types of risk prevail in the material and they concern risking predictability and (financial) stability in urban developments, and societal trust in the municipality and its undertakings. Here, the cases demonstrate two different approaches: organizing urban experiments outside the hierarchical structure of local government and minimizing risk by, for example, providing back-up plans.

Intermediary Organizations as a Municipal Risk-taking Strategy

In case 1, the intermediary organization in the testbed planning process operates not only as a broker to facilitate innovation but also as a municipal risk-taking strategy. One intermediary actor states

One mayor before our current one said to us that [the name of the intermediary organization] has the license to fail. So, it's also the reasoning very much behind why we are a separate limited company and not just a city division. Because a city division needs to stay in the budget, and they need to do the things which are valuable in the city at the moment. But our values are in our projects which may fail in a way if a solution or method that we try and perceive it is not fitting. That is not a failure for us. For the city division it would be a failure. (Case 1, Intermediary actor 1)

What is highlighted in the quotation is that failure is socially acceptable within the intermediary organization, and that this is different from what is perceived acceptable in the municipal hierarchical organization. By organizing the experiments outside the hierarchical organization, municipalities are considered able to carry out their everyday operations and not be negatively affected by experiments that fail or do not perform as intended. In the intermediary organization, risk-taking is part of its brand – it's what they do. However, as one transport planner suggests, too many failed urban experiments may still reflect poorly on the municipality and its undertakings.

We have to be very careful of course, we need some success also and if every pilot is failing, then the smell of the [testbed] is not very good and that's why we need success from pilots. (Case 1, transport planner 2)

To ensure success in the testbed is, however, not straightforward, as it appears difficult to strike a balance between, on the one hand, being open about *what* can be experimented on in the testbed, and on the other hand, guaranteeing some form of long-term success from urban experiments. Prioritizing projects and in combination with keeping urban experimentation to a limited project fund becomes part of the intermediary actor's risk-taking strategy. One respondent states

We have to be careful if the concept doesn't look good, then we don't choose it and of course we can follow the pilot and its ongoing and try to guide it the right way but, but I think piloting is a little bit risky. What we are looking back at, it's helping that they are not that big projects and if we fail something, then it's only some money we are losing. (Case 1, intermediary actor 2)

The risk that is primarily brought forward is financial risk, which in turn the intermediary organization appears to deem acceptable.

Minimizing Financial Risk by Providing Back-up Plans and Communication Campaigns

The strategy of organizing risk-taking outside the local government stands in contrast with the cases where the municipalities try to minimize the organizational risks by providing back-up plans or communication campaigns (cases 3, 4 and 5). Case 3, 4 and 5 included urban experiments with the municipal parking norm, where developers were granted exclusive acceptance to deviate from the existing parking regulation and build 'car-free housing'. These processes did not include any intermediary organization

and were joint ventures between the developer and the municipality – and in one case also between a mobility service provider. In all cases, the planners were presented with the risk that the future residents would not be as car-free as intended. By formally having accepted a deviation from the car-parking norm under the logic of testing and experimenting, the car-parking infrastructure in the urban district would risk being insufficient for future needs. What organization should have the financial responsibility to provide additional car-parking spaces, if post-occupancy evaluations show that residents, contrary to the original intent, own cars? This appears as a central and much debated matter between the actors in these processes. In Case 4, the developer brings forward that the experiment may bring about positive outcomes for all actors and society at large and, hence, all involved actors should share the financial risk-taking:

As we see it, a pilot project includes a certain risk-taking for all parties involved (the municipality, the developers, the mobility service provider and perhaps mainly the residents). It is also reasonable that all parties take their share of the risk in a pilot project like this, based on the potential that everyone will share the benefits (reduced car traffic and more efficient land use, more attractive housing, new market for mobility services, better personal finances, etc.). (Case 4, developer's statement in official communication)

In the quotation above, which is taken from formal communication concerning the municipal decision to deviate from the car-parking regulation, the developer wishes to share the risk-taking between the parties and is not ready to alone assume responsibility for possible future costs connected to the experiment. However, the municipality made the developer responsible for providing additional car-parking spaces if evaluations of the experiment indicate that residents own cars, i.e. shifting the risk. In Case 3, the urban planner instead made the housing association responsible for ringfencing a fund that should be used to sort out alternative mobility solutions if the future residents find their mobility situation insufficient. One respondent states

So, parts of this money that they did not pay for parking spaces they had to put in a mobility pot that was to be managed by the housing association, which in turn was secured by a two-thirds majority in the housing association's statutes [...] That money was ring fenced for flexibility in mobility [...] For example, 'we do not need carpool cars, we need VOI scooters instead'. Then there is money for it. Maybe even 'we need to rebuild the garage so cars can fit because it turns out that ten bought cars.' And then there is money for it. So, it was some form of long-term security. (Case 3, urban planner).

In the quotation above, the planner raises the various ways in which they tried to ensure long-term stability and avoid future unsatisfactory parking situations should the experiment fail. In this case, they aimed to minimize the municipal risk by shifting the responsibility to the housing association for sorting out their (possibly different future) mobility needs by demanding a specific mobility fund to be in place. In the detailed development plan, the municipality highlighted locations where car-parking could be provided should there be a need. In Case 5, the municipality instead demanded that the developer would invest the money they 'saved' from not building parking in other forms of infrastructure that would support biking. This demand also operated to counteract unfair competitive advantage for the specific developer. This included everything from specifying elevators that fitted cargo bikes and cooling food delivery boxes in entrance hallways to providing free rain jackets to all residents. In Cases 4 and 5, the municipality

further demanded that the developers carry out communication campaigns, making sure that no-one moved into the housing without knowledge of the restricted parking context. In all these examples, risking stability in urban development appeared challenging to urban planners and was not something that they are ready to immediately compromise upon.

In summary, predominantly two types of organizational loci of risk prevail in the empirical material: long-term stability and control of urban development and societal trust in municipal operations. One strategy for approaching organizational loci of risk at large was to minimize risk by organizing the experiments in separate intermediary organizations and by prioritizing experiments that are less risky and restricting them to limited funds. Another municipal strategy was to minimize the risk of unexpected future costs by shifting the responsibilities to the developer and/or housing associations to provide backup plans.

Refusing Political Risks

In terms of the political loci of risk, predominantly one type of risk prevails, and it concerns the ability to maintain political stability and the possibility to be re-elected. Although politicians are in many ways perceived to be supporting urban experimentation at large, it appears that politicians are not ready to engage in urban experimentation that may jeopardize their political positions or that results in angering members of the public. Here, different types of mobility experiments appear to different degrees politically sensitive matters and thus present to different degrees political risks. Experimenting with parking norms (Cases 3, 4 and 5) appears generally as a contested, perhaps even controversial, political question that upsets some members of the public, making politicians ambiguous and conflicted in pursuing experiments that may make it difficult to own and use cars in urban areas. According to civil servants, the politicians manage this risk by requesting knowledge or investigations of possible effects and consequences of experiments – to a much greater extent than what they otherwise would require in conventional planning processes. The politicians are perceived as being conflicted between wanting to accommodate the citizens who are motorists and wanting to explore urban experimentation as a method for reducing the number of cars in the city and achieve sustainability. One urban planner states

The second was that they were afraid of making a decision that would affect them negatively in future elections. Because the car, those who use cars really like their cars. One can feel it oneself when one drives a car, it is very nice. So, one was really afraid that people would actually buy a car in this housing and then it would spill out onto the street and steal parking places from others. (Case 3, urban planner)

In the quotation above, the planner recognizes that the politicians were concerned about not being re-elected due to a possibly messy traffic situation if the experiment fails. Since messy traffic situations undoubtedly will return to their desk post experimentation, this makes urban experiments a possibly high political cost to elected politicians. What is politically possible to experiment with in testbed

planning becomes consequently a new guiding question for urban planners to navigate. One respondent highlights the importance of having democratic anchorage and political support of the experimental activities:

This political dimension must be included in this so that one does not think that this is just a matter of whether we should innovate or not. [...] If you do not think anything works particularly well, yes, but what can we test for trying something new? Yes, but what is politically possible here. What is possible to test without it becoming too much ... you must have a majority for it and so on. (Case 5, urban planner)

These types of concerns are also raised in Case 2, where both the intermediary actor and the smart city coordinator highlight that the experiments must be based on municipal needs and not on a quest for technological development per se.

Experimenting with smart mobility services, such as apps or autonomous buses, appears in contrast to car-free housing not to be as politically sensitive and thus more acceptable. Such activities are widely considered as contributing to branding the city as 'innovative' and 'forward thinking', making the politicians appear progressive. Civil servants also suggest that smart mobility experiments consist of comparatively small monetary investments for the municipality and consequently do not interest and engage the politicians and members of the public to the same degree as perhaps new infrastructure developments, such as building new bridges, parking garages or railways does, and can hence exist in the shadows and away from public scrutiny. Urban experiments with smart mobility services are instead perceived as being aligned with the political objectives of showcasing and demonstrating new technology for branding the municipality on the global arena.

In summary, maintaining political stability and the possibility for re-election are elevated as political risks in the material. This risk is diminished by ordering investigations of long-term consequences of urban experimentation, 'guaranteeing' that it will work, but also making sure that the urban experiments are based on municipal needs.

Concluding Remarks

This study has shown that urban planners appear reluctant to take any risk – neither individual, organizational or political – which makes sense from a public sector perspective whose objective is to govern risk on behalf of citizens, but less so from the perspective of urban experimentation. To reiterate a point raised earlier, to consider risk acceptable also means that there is a perceived equality and justice with regard to the distribution of benefits and risks (Renn, 2008). So, one question that is worth asking is who and what organizations are primarily benefiting from risk-taking in processes of testbed planning? The development of urban experiments within the field of smart mobility appears to be driven by private sectors' aspiration for growth and competitiveness and less so by a demand from local governments and citizens. If municipalities are expected to take risks that may negatively affect them, they surely must want to feel that the potential benefits may include public values and positively affect the citizens and the wider municipal development – and not only open to commercial exploitation and facilitation of new business models. But in those instances of experimenting with 'parking norm

zero', fair distribution of possible benefits from the experiment is perhaps less clear. What constitutes acceptable public sector organizational risks in this context? These are pressing questions to consider if the municipality wants to use urban experimentation as a means and method to achieve sustainability. This points in turn to the need for open and inclusive deliberation of risks and benefits and the formulation of an explicit and inclusive risk-taking strategy, and by doing so, settling what compromises acceptable risks and consequent notions of responsibility in testbed planning processes. Not only for the sake of local democracy and securing public value (Vigar *et al.*, 2020), but also for making the conditions for experimenting explicit and transparent to experimenting actors. This requires thinking through what risks the transition to sustainability necessitate, and what comprise acceptable risks in the public sector vis á vis the private actors.

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