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## Adapting to new realities: an analysis of institutional work in three cases of Dutch infrastructure planning

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The social and institutional context of infrastructure planning has shifted tremendously over recent decades. From top-down implementation, infrastructure planners are now forced to incorporate the demands and wishes of citizens and other external stakeholders. This paper adopts the analytical perspective of institutional work to analyse how a number of Dutch infrastructure planning organisations try to remain in control over these changes in their institutional context. Building on social systems thinking, this paper distinguishes three environments in which this control can play out: the internal environment over which an organisation has complete control, an external environment over which an organisation has little control and a transactional environment where the organisation, through its interactions with other actors, can influence institutional development. The paper concludes that while most forms of institutional work applied by the infrastructure planning organisations under study aim to change the organisations' interactions with stakeholders, the forms of institutional work are predominantly located within the internal environment of planning organisations.

**Keywords:** institutional work; agency; infrastructure planning; social system boundaries

### 1. Introduction: coping with a changing infrastructure planning context

Infrastructure provides the basis for modern human life. It enables the flow of people, goods, resources, energy, water and waste. Traditionally, infrastructure planning has always been the domain of engineers, and planning organisations in this field always operated under a technocratic logic where plans and decisions were legitimised based on the technical expertise represented by these organisations (Bergsma 2016a). However, the world around infrastructure planning organisations is rapidly evolving (Graham and Marvin 2001; Guy et al. 2012). The spread of neoliberal ideology demands infrastructure planning organisations to be increasingly cost-efficient and competitive, while society calls for more openness, public accountability and citizen involvement in infrastructural planning (Wolsink and Devilee 2009). In addition, the claims of infrastructure planning on land increasingly conflict with the spatial claims of other actors, forcing infrastructure planning to change from line focused to area based management (Heeres, Tillema, and Arts 2012).

These external developments change the institutions that guide infrastructure planning. Rather than mobilising rational-planning expertise for the “public good”, infrastructure planning organisations are increasingly pushed to open up their

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management styles and become more responsive towards the specific needs of stakeholders in their operational area. How do infrastructure planning organisations adapt to these new circumstances, and how do they attempt to remain in control over these changes?

Institutions comprise the informal patterns and formal rules that structure the behaviour of actors and organisations in a society; they provide “taken-for-granted or legitimate models” that actors and organisations act upon daily (Clemens and Cook 1999, 444). Institutions thus have a strong structuring influence on society but at the same time, they are generated from, upheld by and can even be changed through social (inter)actions (Giddens 1984; North 1990). The theory of “institutional work” focuses on the autonomous role of actors and organisations in maintaining, disrupting and changing the institutions that impact on them (Lawrence and Suddaby 2006). In this paper, the theory of institutional work is applied to study how infrastructure planning organisations try to come to grips with, and remain in control over, changing external circumstances by influencing the institutions that guide their interactions with stakeholders.

This is done in three contemporary cases of infrastructure planning in the Netherlands, which focus on three different fields: public water supply, electricity, and public transportation. Based on these cases, the paper examines a) how the involved infrastructure planning organisations have internalised and adapted to changes in their external environment, b) how the infrastructure planning organisations have tried to assert control over this process, and c) what the similarities and differences are between the three fields of infrastructure planning. It does so to answer the main question of the article: *how do infrastructure planning organisations try to keep influence over the process and direction of institutional change in the field of infrastructure planning?* While contextual changes push infrastructure planning organisations to “open up” their governance styles, the article concludes that the internal organisation of infrastructure planning organisations is key to retaining influence over the interactive planning processes that increasingly characterise infrastructure planning in the Netherlands.

This paper is organised as follows. Section 2 describes the changes in the field of infrastructure planning. Section 3 develops a theoretical framework that combines insights from the institutional and organisational literature and describes how this framework is used in the three case studies of Dutch infrastructure planning. Section 4 presents the case study findings, which are reflected upon based on the theoretical framework in Section 5. Finally, Section 6 concludes the paper.

## **2. Modern challenges to infrastructure planning**

### ***2.1. Shifting approaches***

Infrastructure planning is of vital importance to encouraging societal progress. This was the core assumption of a new intellectual elite that emerged in the nineteenth century across Europe (Van der Vleuten 2004). Members of this elite held an organic view of society: they believed a good national infrastructure system would contribute to the rational circulation of people and knowledge in a country and help maximise the productive potential of society (Baneke 2011). The central state, in its capacity as guardian of the public interest, was trusted with the responsibility to create these conditions by managing large-scale infrastructural projects such as roads, railways, and canals (Den Hoed and Keizer 2007). Thus, from the mid-nineteenth century to well into the 1960s, infrastructure planning in Europe emerged as a central state activity

(Graham and Marvin 2001). The first decades of the 1900s saw a roll-out of large scale water, telephone, gas, and electricity infrastructure networks across industrialising countries. The services provided by these infrastructures were considered essential public goods, and because they required standardisation, technical expertise, and integrated management, they were often brought under government-led or government-sanctioned monopolies (Graham and Marvin 2001). Infrastructure management became sector-, project-, and goal-driven, with a strong focus on cost-efficiency.

However, the rational approach to infrastructure planning and management decreasingly fits the contemporary societal context (Furlong *et al.* 2016). A changing society with increased uncertainty and complexity, calls for infrastructure planning that is adaptive and responsive to expected and unforeseen change (Giezen 2013; Giezen, Bertolini, and Salet 2015). Increasingly, there is an ambition to develop water and energy frameworks that are more open, flexible and responsive (Furlong *et al.* 2016; Monstadt and Schramm 2017). It is recognised that a successful transition to new infrastructural regimes requires the incorporation of a multitude of actors in decentralised planning structures (Castán Broto and Bulkeley 2013a; Castán Broto and Bulkeley 2013b). Infrastructure planning organisations are struggling to integrate the participatory aspects of decentralised infrastructure planning (Van Doren, Giezen, and Driessen 2016). They face technical, socio-cultural, economic and institutional barriers in this transformation (Yaqoot, Diwan, and Kandpal 2016).

The new challenges presented to infrastructure planning organisations cannot be addressed through the traditional rational-planning approach, but require planning organisations to embrace and work with complexity to reduce uncertainty about future developments and changing societal demands (Giezen 2013). In this new playing field, traditional infrastructure planning organisations, such as water boards and electricity infrastructure providers, are forced to reflect on their identity, their role and their interaction with their socio-spatial environment. This reflection means they have to rethink and realign their strategies to enable them to reach their goals in this changing environment. In other words, they find themselves in the process of institutional restructuring in which institutional patterns are realigned to shifting societal demands. Institutional work, as developed in the next section, can illuminate how infrastructure planning organisations institutionally reorganise to deal with this shifting societal reality.

## **2.2. Challenges in Dutch infrastructure planning**

In line with developments described in the introduction of this article, infrastructure planning in the Netherlands evolved as a top-down, technocratic endeavour in the nineteenth century. Planning organisations were invested with large implementing powers, establishing a quite unequivocal line between the development and the implementation of infrastructural plans. Infrastructural plans were developed by planning organisations, who justified these plans in relation to their national costs and benefits (Bergsma 2016b). Once approved by the responsible political authority (the national government, the city council), the plans were usually implemented without much consideration of their effects on the social and spatial environment.

In response to growing ecological concerns in the 1970s, infrastructure planning organisations were pushed to take ecological concerns into account in the development of their plans. Some planning organisations, such as the central water management authority Rijkswaterstaat, even incorporated ecological expertise in their internal structure (Van den Brink 2009). Under the spread of a neoliberal ideology on public management

in the 1980s and 1990s, the national government partly devolved its powers in the public domain and transferred these powers to semi-independent regulatory and planning agencies in different domains. Societal changes in this period created a more active and pronounced society with citizens demanding their regulatory and planning agencies to be open and responsive to their questions and demands.

These developments over the last 50 years have considerably changed the external context of infrastructure planning in the Netherlands. Planning organisations are forced to let go of their traditional technocratic management style. Instead, they are required to participate in interactive and dynamic planning processes in which they interact and collaborate with regional stakeholders. In these processes, they have to demonstrate how different stakes and interests were weighed against each other in the development and implementation of infrastructural plans.

### **3. Theoretical framework: institutional work and social system boundaries**

This article develops a framework to analyse how infrastructure planning organisations adapt to, and try to control, the impact of external changes on their daily operational and management practices. This framework is based on two pillars: institutional work and social systems boundaries. The first is used to analyse the work done by infrastructure planning organisations to influence their institutional environment. The second helps to place this institutional agency in a wider context by breaking it down into different “spheres” of influence an actor has on its (institutional) environment.

#### **3.1. Institutional work and institutional restructuring**

Theoretical developments around “Institutional work” are particularly useful to analyse the role of actors in shaping their institutional context. The approaches of institutional work (Lawrence, Leca, and Zilber 2013) or institutional entrepreneurship (Woolthuis et al. 2013) assume that there are actors actively and strategically working to change institutional structures. It is defined as: “the purposive action of individuals and organisations aimed at creating, maintaining, and disrupting institutions” (Lawrence and Suddaby 2006, 215). The approach integrates literature on institutional entrepreneurship (e.g. DiMaggio 1998) with Sociology of Practice Theory (e.g. Jarzabkowski and Whittington 2008).

From a review of empirical research, Lawrence and Suddaby (2006) distil nine forms of institutional work, as shown in Table 1. The first three types (advocacy, defining, and vesting) describe principally political forms of institutional work in the sense that they encompass the activities actors undertake to change the roles, rules, property rights and boundaries that open up or limit their access to resources. These activities play out at the formal level of rule-making and regime formation (Young 1989). As Meyer and Rowan (1977) and DiMaggio and Powell (1983) have argued, formalised institutions are difficult to change because they represent models for interaction that are legitimised by, or within, a state which tend to reproduce themselves over a wide array of policy fields. The neoliberal quest for regulatory competition and efficiency, for example, not only influences the field of infrastructural planning but also underlies regulatory developments in health care and education.

The second three forms (constructing identities, changing normative associations, and constructing normative networks) primarily deal with the activities actors undertake to influence the normative foundations of institutions. Institutions are always underpinned by a “logic of appropriateness” that provides meaning to and legitimises institutional

Table 1. Forms of institutional work (Lawrence and Suddaby 2006, 221).

Forms of institutional work	Definitions
Advocacy	The mobilisation of political and regulatory support
Defining	The construction of rule systems that confer status or identity, define boundaries of membership or create status hierarchies within a field
Vesting	The creation of rule structures that confer property rights
Constructing identities	Defining the relationship between an actor and the field in which that actor operates
Changing normative associations	Re-making the connections between sets of practices and the moral and cultural foundations for those practices
Constructing normative networks	Constructing of inter-organisational connections through which practices become normatively sanctioned and which form the relevant peer group with respect to compliance, monitoring, and evaluation
Mimicry	Associating new practices with existing sets of taken-for-granted practices, technologies, and rules in order to ease adoption
Theorising	The development and specification of abstract categories and the elaboration of chains of cause and effect
Educating	The educating of actors in skills and knowledge necessary to support the new institution

patterns (March and Olson 1989). For example, the large autonomy of traditional infrastructure planning organisations was supported by a strong belief in the value of their rational expertise for state planning. When this logic of appropriateness is challenged, actors start to question their institutions and space opens up for institutional change (Clemens and Cook 1999). For example, when social-constructivist elements behind knowledge production were emphasised in the 1970s, trust in rational-planning expertise dwindled. This second category of institutional work focuses on the activities actors engage in to influence (change or maintain) the belief systems that underlie institutions.

The third group of actions (mimicry, theorising, and educating) relates to the cognitive aspects of institutions. They refer to the way in which actors reflect on (changes in) their institutional environment, and their role and practices in it. Giddens (1984) already acknowledged that as actors interact with institutions, they can reflect on their institutionalised practices and change these practices when they are no longer deemed fit or right. This third group of activities describes how actors and organisations, through their reflections, can reproduce (mimicry), provide meaning (theorising) or adapt (educating) to their institutional context.

Theories of institutional work can help to better understand how infrastructure planning organisations cope with the impact of external changes on their field. They can engage in lobby activities at the formal level to try to influence the direction of public policy-making, they can try to change the belief systems that guide their interactions with other actors and organisations, and they can internally reflect on their role and practices and adapt their internal structure to better match their new environment. In undertaking these activities, infrastructure planning organisations

are influencing their institutional context; irrespective of whether they strive to uphold existing institutions or change institutions in response to external developments, these activities influence the formal rules and informal patterns that structure the behaviour of actors and organisations in the field of infrastructure planning. Studying these issues through a lens of institutional work thus highlights the agency of these planning organisations in institutional development.

As compellingly argued by Giddens (1984), all agency takes place within a wider institutional context that forms and shapes the actions of individuals. Referred to as the “duality of structure”, Giddens emphasises that as actors internalise institutional structures, they reproduce these institutions at the same time. For Giddens, this first and foremost meant that institutions are co-creations of agency and structure. Later, institutional scholars have expanded on this notion and argued that in processes of institutional reproduction, actors can and often do act strategically by actively striving to align institutions with their worldviews or interests (Kingdon 1995; Hajer 1995; Clemens and Cook 1999; Arts and Van Tatenhove 2004). The introduction of institutional work can be seen as a further exponent of this focus on strategic agency within institutional theory. With this focus, however, Giddens’ idea about the duality of structure has shifted to the background in the theory-building around institutional work. In this paper, we therefore adopt the view also expounded by Lawrence, Leca, and Zilber (2013) and Beunen, Patterson, and Van Assche (2017) that institutional work is intractably linked to the structuring force of institutions. Rather than understanding institutional work as a unilateral relationship where planning organisations influence the institutions that guide their (inter)actions, we understand institutional work as a dialectical process of *institutional restructuring* driven by institutionally bounded agency upon those same institutions.

### 3.2. Social system boundaries

When institutional work is understood in terms of the dialectical relationship, as specified above, it becomes crucial to analytically delineate the boundaries between actors/organisations and their environment. To do this, we use the concept of social system boundaries (Gharajedaghi 2011).

Arguing that “[n]o problem or solution is valid free of context”, Gharajedaghi (2011, 31) emphasises the important role of context for understanding how social systems (organisations, networks, etc.) behave. To structure thinking about the relationship between the self-organising capacity of organisations and their context, he distinguishes between three different environments of social systems (Figure 1): the internal, the external and the transactional environment. The internal environment comprises the



Figure 1. Social system boundaries (Gharajedaghi 2011).



realm over which an organisation has significant control. The external environment represents external factors and developments over which the organisation has little direct control. There is a grey area on this boundary, which is referred to as the transactional environment. The transactional environment is where the organisation interacts with other stakeholders and while it cannot control these interactions or their outcomes, it can assert influence.

The distinction between the three environments as different spheres of influence of an organisation helps to understand and conceptualise the influence an organisation has over its institutional context. In Table 2, we connect the different forms of institutional work outlined in the previous paragraph to the three environments of organisational capacity identified in systems thinking. An organisation can try to change its institutional context by adjusting its internal

Table 2. Different forms of institutional work in different social system environments (Lawrence and Suddaby 2006, 221).

Environments of social systems	Institutional work	Definitions
External environment: difficult to influence by organisations	Advocacy	The mobilisation of political and regulatory support
	Defining	The construction of rule systems that confer status or identity, define boundaries of membership or create status hierarchies within a field
	Vesting	The creation of rule structures that confer property rights
Transactional environment: can be influenced by organisations	Constructing identities	Defining the relationship between an actor and the field in which that actor operates
	Changing normative associations	Re-making the connections between sets of practices and the moral and cultural foundations for those practices
	Constructing normative networks	Constructing of inter-organisational connections through which practices become normatively sanctioned and which form the relevant peer group with respect to compliance, monitoring, and evaluation
Internal environment: organisations are in control	Mimicry	Associating new practices with existing sets of taken-for-granted practices, technologies and rules in order to ease adoption
	Theorising	The development and specification of abstract categories and the elaboration of chains of cause and effect
	Educating	The educating of actors in skills and knowledge necessary to support the new institution



modus operandi, which lies in the realm of its internal environment. It can try to influence the patterns of interaction between the organisation and its stakeholders in the transactional environment. While in Gharajedaghi's (2011) model the external environment cannot be influenced by an organisation, in this paper we adopt a less stringent view. While the institutional literature emphasises the autonomous strength of formal institutions, depending on the type of organisation and context, we assume that organisations can engage in activities of institutional work directly focused on their formal institutional environment (e.g. political lobbying).

### **3.3. Methods**

Following the framework outlined above, infrastructure planning organisations are autopoietic systems that are in a continuous process of defining and redefining their identity in relation to themselves and their outside context (Mingers 2004; Seidl 2005). This paper applies the framework to three cases of contemporary infrastructure planning in the Netherlands: the provision of public water supply, the modernisation of an electricity grid network and the construction of an inner-city metro line in Amsterdam. In these cases, the theoretical framework presented above is applied to analyse the process of institutional restructuring from the viewpoint of infrastructure planning organisations involved in these cases. By comparing the forms of institutional work employed by the planning organisations in these different policy domains, insights are generated about the different and shared characteristics of institutional work in the field of infrastructure planning.

To structure the analysis, the following research questions were formulated:

- (1) How have the organisations responsible for infrastructure planning in the cases internalised the changes in their environmental context in their daily routines and practices?
- (2) How have these infrastructure planning organisations adapted their strategies to assert control over this process?
- (3) What forms of institutional work can be recognised behind these efforts and in which organisational environment can these efforts be placed?
- (4) What are the similarities and differences of this institutional restructuring between the three fields of infrastructure planning?

Two types of data sources were used. First, interviews were held with key representatives of the infrastructure planning organisations involved in each case (see [Table 3](#) for an overview). These interviews served to gain insight into the strategies developed by the planning organisations to respond to changing contextual circumstances. Second, policy and additional (secondary) documents were consulted to better understand these contextual changes.

As can be seen in [Table 3](#), the number of interviews differs per case. The reason for this lies in the different characteristics of each case. Dutch public water supply is managed by ten semi-independent planning organisations and our interviews covered over half of this administrative layer. The electricity infrastructure in the Netherlands is overseen and managed by one organisation, which is responsible for administering the national high-voltage grid. We conducted two interviews with one of the organisation's stakeholder managers. In the case of the inner-city metro line construction, the focus was on a local planning project, and our interviews covered

Table 3. Interviews per case.

Case	Public water supply	Electricity grid management	Inner-city metro line construction
Interviews	Interviews with stakeholder managers of six Dutch drinking water companies	Interviews with a stakeholder manager of the Dutch national electricity grid agency	Interviews with three stakeholder managers of a planning bureau responsible for the construction of an inner-city metro line

different layers of the responsible planning organisation. More information and background about these organisations is provided in the case descriptions. Before we present the results of the three case studies, we first provide a brief overview of the key challenges in modern infrastructure planning.

#### 4. Results: three cases of infrastructure planning in the Netherlands

This section presents the results of the analysis and focuses on the specific efforts of infrastructure planning organisations in three different fields of infrastructure planning (drinking water, electricity grid management and local public transportation) to come to grips with and control the institutional changes brought forward by the external developments in their fields.

##### 4.1. Dealing with a changing context in public water supply planning

Access to clean and safe drinking water is a basic human need. In the Netherlands, the supply of safe drinking water has been qualified as a national priority in the 2011 Drinking Water Act. Responsibilities for public water supply are shared between different governmental layers (Beleidsnota Drinkwater 2014, 30). The national government sets the quality standards, the provincial government ensures sufficient availability and quality of drinking water resources, and the daily supply of drinking water lies in the hands of ten regional water companies. These water companies are responsible for guaranteeing Dutch citizens continuous access to safe drinking water.

The abstraction, processing and supply of drinking water depend on complex technical procedures that largely remain underground and Dutch water companies have largely operated on the basis of trust. However, over the last two decades, this basis of trust has come under pressure. Space in the Netherlands has become scarce, and the infrastructural plans for the provision of drinking water increasingly conflict with the spatial claims of other (public) services such as housing, electricity, and industry. Management responsibilities for these services have in many instances been decentralised or deregulated, altering the playing field of stakeholders interacting with water companies. In addition, water companies are faced with a growing number of citizens and businesses that launch, or want to initiate, decentralised applications for the production of drinking water.

All interviewed water company representatives recognised this changing context. They are increasingly involved in interactive and collaborative planning processes in which they have to directly interact with a whole array of stakeholders, ranging from other service providers to industry representatives, local governments and citizens. These changing circumstances have forced water companies to move away from their traditional expertise-led management style. The strategies developed to deal with this more dynamic character of infrastructure planning, however, vary greatly between water companies. Some companies have set up new departments to maintain contacts with the company's stakeholders; in some cases these departments are centralised within the organisation to be close to the management level, but in other cases, stakeholder managers are assigned to regional offices where projects are implemented. Other companies have walked a more evolutionary path. These companies have not changed their organisational structure but respondents note that rather, their routines and practices have changed; tools such as stakeholder analyses and area scanning are increasingly used but stakeholder management is not formally structured within the organisation.

The case results show that, in the Dutch drinking water sector, institutional restructuring is still in an early phase of development. Water companies are mostly adapting to changes in their transactional environment to better deal with the widening of the range of stakeholders drinking water companies encounter and the changing roles and attitudes of these stakeholders. Water companies internalise the new institutions brought forward by external dynamics, but their adaptation strategies display little deliberate action to actually influence the institutions in their field. According to our respondents, water companies are currently in search of new strategies to better deal with the fluid and dynamic character of infrastructure planning to continue to protect the goals and interests of Dutch drinking water provision in the future.

#### ***4.2. Dealing with a changing context in electricity planning***

The first public power plant in the Netherlands was built in 1886 in Kinderdijk, a municipality near the city of Rotterdam. This power plant connected 130 individual properties to an underground electricity grid of no more than three kilometres (Lintsen 1993, 149). Anno 2017, the Dutch electricity network consists of over 300,000 km of electrical wires and connects virtually every building and street. Regional electricity networks are served by a high-voltage national grid, which is managed by a public agency.

For a long time, the tasks of the national grid agency mainly focused at maintaining the existing high voltage grid. However, when the national grid needed to be expanded and modernised, the agency transformed from a maintenance into a project organization. In this transformation, stakeholder managers were hired on a case-by-case basis to identify stakeholder interests and needs. Stakeholder relationships were built within the context of individual projects. However, as society changed over the years, the agency faced new challenges. Both within the planning area and on a broader geographical scale, stakeholders increasingly expressed concerns about the negative impacts of new electricity lines. This demanded a more structural approach to stakeholder management.

While this increase in stakeholder activity was recognised within the organisation, it took some time to generate a sense of urgency for organisational reform. Gradually, the benefits of getting to know stakeholder interests and of integrating these interests into the planning process to weigh up choices were demonstrated, and in 2010 it was decided to develop a new organisational strategy for stakeholder management.

This stakeholder management strategy is based on the principle of ‘learning by doing.’ As the agency had no institutionalised experience in stakeholder engagement, it decided to appoint permanent stakeholder managers and to develop a handbook for stakeholder management based on lessons of practice. To feed this handbook, structural meetings between these stakeholder managers were organised. Besides the discussion of specific project-related challenges, these meetings function as a vehicle for stakeholder managers to share positive and negative experiences and identify good practices in stakeholder management. The agency encourages its stakeholder managers to use the Plan-Do-Check-Analysis (PDCA) cycle, both to reflect on their actions in specific planning processes as well as to reflect on stakeholder interactions in general (Maruta 2012). The good practices are collected in a handbook on stakeholder management, which is thus a ‘living document’; it is continuously supplemented with new lessons generated from the stakeholder management practice.

According to the stakeholder manager we interviewed, the agency is now more on top of the changes that transpire in its transactional environment. While the management of the national electricity grid still follows a top-down planning logic in the sense that the location of the electricity grid is by and large fixed, the agency now engages with its stakeholders in an early phase of the planning process to better inform these actors and develop solutions (by looking for flexibility in the planning or in terms of compensation) together with all parties.

#### ***4.3. Dealing with a changing context in the construction of an inner-city metro line***

In the Dutch capital city of Amsterdam, a metro line is being constructed to connect the northern part of the city to the south. For this, an underground metro tunnel is being excavated that cross-cuts right through the heart of the historic city centre. Plans for this metro line date back to the 1980s, but the first plans were postponed because of concerns about the high costs involved and uncertainties about potential destabilising effects of underground excavations on buildings above ground. After many (political) discussions, the city council approved the project in 2003 and the construction was started. Management and oversight tasks were delegated to a management bureau, which subcontracts large parts of the construction work (about 90%) to private building companies.

At the start of the project, the bureau followed the methods common to most infrastructural planners: a top-down management style led by technical experts who tend to downscale social concerns to technical questions about their construction plans. Thus, the increasing number of notifications residents gave about cracks in walls, clasp windows and jammed doors were waived referring to the safety guarantees in the building plans. This management style suddenly hit its limits in 2008, when a number of residential buildings in close vicinity to a borehole for a subway station actually subsided. In the middle of night, residents had to leave their apartments for their own safety. The construction was halted for a short period, but after technical research had declared safe building conditions, the work continued. However, a couple of months later buildings again subsided. A more definite stop was put to the construction of the metro line after this incident.

The event was followed by a long period of discussions. First on the extent to which the problem could have been foreseen by the bureau and which would mean that the bureau could be held accountable for the damage done to the historic buildings. Independent research demonstrated that the subsidence was caused by an, until then, unknown problem in the building procedure, which could easily be prevented in future

situations. Then, a discussion started on the question of whether the work on the metro line should be resumed, knowing that the city had already invested many millions but also knowing that many people fear its impacts. These discussions were instigated by a report of the municipal ombudsman, which stated that local residents were insufficiently and inadequately informed about the planning activities for the metro line and its risks (Gemeentelijke Ombudsman 2008). In 2009, a national advisory committee concluded that the metro line could best be completed to safeguard gains on already made investments, but that the planning process should be organised fundamentally differently (Commissie Veerman 2009). From now on, the bureau should take full account of its environment and be open and responsive to its stakeholders.

For the bureau, these events were a game changer. The organisation completely transformed its internal organisation and management style. It developed a central vision on stakeholder management based on a number of core values (such as responsiveness, accessibility and flexibility, Harms 2012). It appointed stakeholder managers at different levels of the planning organisation. There is a director of Stakeholder Management at the central level who closely cooperates with the communication department in developing and maintaining the central vision on stakeholder management within the organisation. Under this director, two stakeholder managers operate at the central level of the organisation to ensure a sound translation of the central vision from the inside to the outside world and who manage the contacts with political and other important stakeholders. At the level of the construction site, the work has been subdivided into different regional projects, each with its own regional stakeholder manager (division manager). In addition to the appointment of these stakeholder managers, a new hiring policy was installed in which technical and administrative personnel were selected partly based on their social competences.

For the stakeholder managers we interviewed, the central vision and core values provided a yardstick against which they measured their daily activities. Having worked with this strategy for over five years, they have internalised it as a new institution, which they act upon and that they actively convey in their interactions with stakeholders in the transactional environment. For example, the stakeholder managers are very keen on being responsive towards public questions and concerns. They play a crucial role in 'translating' these concerns to their technical and administrative colleagues, and reversely, in translating technical and administrative explanations to the public. In these translations, they continuously strive to create room for solutions that take away public concerns, but also to be honest about the risks citizens face and the choices that are made within the planning bureau.

Through these efforts, the bureau has managed to adjust the negative image surrounding the metro line and change the patterns of interaction with their stakeholders. For example, stakeholders now directly turn to the bureau's employees with questions and concerns and trust them to find a workable solution. By transforming its internal organisation and management style, the bureau has changed the patterns of interaction that surround their planning process. It has managed to restructure the institutions in their transactional environment, which impact on their planning process.

## **5. Analysis**

This section will provide a cross-case analysis. It will follow the institutional levels of planning and discuss the forms of institutional work undertaken by the different infrastructure planning organisations.

### **5.1. *Institutional work in the external environment***

The changing circumstances in the field of infrastructure planning have an impact on the transactional environment of planning organisations, where they bring about a more varied and dynamic stakeholder field. For the planning organisations we studied, these changes are predominantly seen as part of ongoing developments towards a more open society in which stakeholders (public, private, corporate or individual) have a more active role. It is therefore not surprising that the three cases show remarkably little activity by the infrastructure planning organisations on the level of formal rules of regimes. Government policies regarding deregulation, decentralisation, participation and stakeholder involvement were regarded as ‘given’ rather than changeable.

For example, both the metro line planning bureau, as well as the national grid agency, did not seek to change participatory or zoning regulations to strengthen their position within a changing stakeholder environment. The Dutch drinking water companies have arranged for their political representation in a national-level association, but in the interviews we found little connection between the activities of this association and organisation of stakeholder management within the drinking water companies.

It seems that, in these three cases, the formal rules and regulations were part of the external environment, i.e. outside of the sphere of influence of the infrastructure planning organisations. Therefore, the three works of lobbying, defining, and vesting were not found in these cases.

### **5.2. *Working the transactional environment***

Most forms of institutional work identified in this analysis are directed towards the interactional environment of planning organisations. It is at this level that the impacts of external dynamics are mostly felt by the planning organisations in all three infrastructural fields, as they have to cope with a more diverse and dynamic stakeholder field. In each case, infrastructure planning organisations have engaged in forms of institutional work that aim to change the normative convictions and belief systems of stakeholders.

The planning bureau responsible for the construction of the inner-city metro line radically worked on constructing a new identity for itself. In doing so, it has changed the normative associations stakeholders have with the planning organisation and the planning process. The cases of the national grid company and the water companies also demonstrate planning organisations’ efforts to construct a new identity. While less radically than the metro line planning bureau, the national grid company has changed its identity from a purely technical implementing body to a more open and responsive planning organisation. At various speeds, Dutch water companies have also started moving away from the pure engineering perspective towards companies that publically interact with a wide variety of stakeholders.

### **5.3. *Working the internal environment***

While most institutional agency is directed towards the interactional environments of infrastructure planning organisations where the impacts of external changes are felt most, not all forms of institutional work actually also directly address this level. Contrarily, one of the key findings of this article is that in their efforts to deal with and control the impacts of external changes on their transactional environments, infrastructure planning

Table 4. Summarised presentation of case study results.

Environment	Forms of institutional work	Drinking water companies	Electricity grid manager	Metro line planning bureau
<b>External environment</b>	Advocacy Defining Vesting			
<b>Transactional environment</b>	Constructing identities	Changing the organisational identity	Changing the organisational identity	Construction of a new organisational identity
	Changing normative associations		Bottom-up; changing normative associations through actions.	Top-down; Changing perceptions of citizen engagement and a flexible planning process through a central vision.
<b>Internal environment</b>	Constructing normative networks			
	Mimicry	Incremental adaptation of existing practices	Incremental adaptation of existing practices	Radical change of internal structure
	Theorising		Bottom-up; encouraged by methods such as PDCA	Top-down; theorising is mainly done at the central level of the planning organisation.
	Educating	Supported by the appointment of stakeholder managers	Supported by the appointment of stakeholder managers	Supported by the appointment of stakeholder managers and the implementation of a “social hiring” policy



organisations have mostly turned to forms of institutional work that play out within the realm of their internal environments.

As part of constructing a new organisational identity, the metro line planning bureau also radically restructured its internal organisational structure. A stakeholder director and stakeholder managers were introduced to coordinate this development within the project and with stakeholders in the planning area. Even the hiring of new personnel was based on new core values and included key requisites such as social skills. This internal restructuring has supported the construction of the new identity as it allowed the bureau to effectively act on its new identity. The bureau has moved from a 'we know best' engineering entity to an organisation that actively engages with stakeholders.

While this internal restructuring in the case of the metro line was largely a top-down endeavour, the forms of institutional work undertaken at this level by the national grid agency are characterised by more of a bottom-up approach. This planning organisation took practices from the past to develop a handbook for employees to use when acting in the transactional environment. In addition, it actively facilitated the internal interaction between stakeholder managers to enhance information exchange and learning. The appointment of stakeholder managers and the institutionalised interaction between these managers within the organisation are a clear example of theorising and education work. Also, the development of the handbook of best practices is an attempt at educating and theorising. In doing so, the national grid agency has internally restructured its standardised routines and practices in stakeholder engagement from the bottom up to the top of the organization, to better respond to changes in this environment.

The water companies seem to have moved more incrementally, in this sense taking a pragmatic approach in dealing with stakeholders. Some are setting up new positions for stakeholder managers, but they are generally still only incrementally making changes to their core practices of water infrastructure management.

It should be noted that, in the electricity and drinking water cases, the planning organisations have not changed their internal practices so drastically that complete new practices are now in place. Rather, changes have developed incrementally from existing planning practices. These should be understood as incremental internal adaptations rather than a radical internal restructuring. For instance, the introduction of the PDCA procedure into the work practice of the national grid agency mimics engineering approaches and techniques by presenting stakeholder management as a stepwise systemic system.

The results of this comparative case study analysis are represented in [Table 4](#).

## 6. Conclusion and discussion

The increase in complexity and uncertainty has forced infrastructure planning organisations to rethink their institutional practices concerning stakeholder involvement. But infrastructure planning does not take place in isolation from other domains of society. Following Giddens (1984), this means that when actors try to assert influence on the institutional context that guides infrastructure planning, their actions are already shaped by this same institutional context. Thus, as infrastructure planning organisations try to maintain control over the increasingly dynamic and interactive governance practices that emerge in their field, their attempts to influence these new planning routines are bounded by the context in which they operate.

Starting from this understanding of institutional development, this paper analysed the forms of institutional work employed by infrastructure planning organisations to deal

with, and remain in control over, their institutional context. Empirically, the focus was on three cases of recent infrastructure planning in the Netherlands: drinking water supply, electricity grid management, and local public transportation. We integrated the theory of institutional work with social systems thinking and made a distinction between three different “environments” to which planning organisations can attune their institutional work: the internal, interactional and external environment, with a decreasing level of influence in each environment.

The case studies demonstrate that all infrastructure planning organisations involved in the three cases have performed forms of institutional work to accommodate changes in their transactional environment. Infrastructure planning organisations have to deal with a widening field of stakeholders with diverging demands, which conflicts with the traditional technocratic management style of planning organisations. Paradoxically, the case studies show that while most institutional agency is performed to adjust to and control these changes in the interactional environments of infrastructure planning organisations, the institutional work undertaken by the planning organisations takes place primarily within the internal realm of organisations.

Ultimately, it seems that practitioners in the field of infrastructure planning, in order to cope with changes in their external environment, should reflect especially on how their own internal structure influences the interaction with external actors. There is a natural tendency within infrastructure planning to close off internal planning processes to external actors, and limit the interaction, to prevent an increase in complexity (Giezen 2012). Yet enabling learning and adaptation within the organisation itself, by reflecting on how institutional patterns evoke particular actions within and outside the organisation, is likely to be more effective than going into a defensive strategy. Analyses of behaviour through the theory of institutional work increase the reflective capacity of both researchers and organisations and are therefore a valuable addition to the toolkit of both.

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