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### Navigating mega projects through complexity and uncertainty: strategic and adaptive capacity in planning and decision-making

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## Summary

Over the last few decades, there has been an increasing interest in mega projects from both policy makers and academics. Of particular concern to both has been the seemingly structural time and cost overruns associated with these projects. In response a tendency, especially of policy makers, has been to look for ways of simplifying the decision and planning process. In academia the focus has been more on how to increase transparency and accountability in an attempt to prevent issues such as strategic misrepresentation or optimism bias, and on more adaptive project management to be more responsive to changes in the context of a project and within the project itself. And so it seems that policy and academia address the same problem, but are diverging into different directions concerning the solution.

It is with this as a background, that this dissertation researches the planning and decision-making processes on large transport infrastructure projects. The discrepancy between policy and academia, or between keeping mega projects simple and keeping them adaptive, should be explored by empirical qualitative research into the practice of mega project planning and decision-making. How does the balancing between opening and closing these processes play out in practice and how does that influence the ability within the process to deal with deadlocks and contextual changes? To answer these questions, three case studies were carried out using a narrative/reflexive approach. This research strategy most importantly consists of two types of interviews. The first is a narrative interview that prompts interviewees to share their stories about the project and its crucial moments without steering them into a particular direction. The reflexive interview on the contrary is conducted on the basis of particular hypotheses or specific themes. The three selected cases are the HSL-Zuid, an (inter)national high speed rail project; RandstadRail, an interregional light-rail project; and the Beneluxlijn, which is an extension of the Rotterdam urban metro network.

This dissertation has developed two main concepts to analyze the projects. The first is adaptive capacity, which is the potential within the processes of planning and decision making to make changes to the project or the institutional design. The second concept is strategic capacity. This concept is used to analyze the design of the process, whether it is an open or closed process and if it is responsive to new inputs that might add value to a project. Through enhancing strategic capacity the aim is also to be proactively resilient for occurring deadlocks and to prevent longer periods of inertia.

The results of the analysis in this dissertation show that it is necessary for mega project development to have a responsive and adaptive decision-making and planning process that accepts the uncertainty and complexity of the project and its context. While simplification might be a sensible strategy to reduce uncertainty and complexity in order to manage a project, this is likely to be more successful when the project is relatively uncontested, opposition is limited, and the project does not become an object within a political battle between powerful actors. In projects where these preconditions do not apply, a more responsive, proactive approach to planning and decision-making is more suited. In particular, the research shows that a lower level of strategic capacity will lead to a lower adaptive capacity, and thus a lower ability to overcome deadlock. To develop a mega project, one has to navigate constellations of actors, oceans of uncertainty, and archipelagos of complexity. Ignoring or neglecting these could lead to getting trapped in storms, or a long period without wind, or at the worst hitting an underwater rock.

*All the chapters constituting the thesis are accepted or submitted articles.*