Summary

Infrastructure is one of the most important cornerstones of our society. It enables international trade and thereby contributes to the overall economic growth of a country or region. Yet the contribution of infrastructure is not just limited to the economic aspect of society. At the social level, it brings value by providing education and care and facilitating the movement of people. Infrastructure, in its horizontal and vertical forms, has in fact become an integral part of the daily lives of both families and businesses.

To achieve the defined goals and satisfy the needs of users, the management of the infrastructure network must be carried out in a sound manner. Despite the importance of the network, there exists a mismatch between the demand for infrastructure and its supply. Expectations from users have changed and increased under influence of several macroeconomic factors. An example of this is a change in the demographic composition of a country, such as an ageing population. This will cause the pressure on healthcare to increase, creating more demand for healthcare infrastructure. A second example is climate change. Climate change requires resilience of our infrastructure network so that it can adapt to changing conditions and cope with extreme natural phenomena. For example, coastlines will need to be strengthened to withstand rising water levels.

Fulfilling demand is complicated by constraints on the supply side. Government budgets for public infrastructure are limited and the current infrastructure network is nearing the end of its service life. Investments in both new infrastructure and maintenance are falling short, while significant investments are required.

This dissertation investigates where potential efficiencies are located in the current management of public infrastructure, with the aim of better responding to the demands without needing to allocate additional resources. For this purpose, the initiation phase, the planning phase, the development phase and the realization phase were analyzed and a proposal for optimization was made for each phase.

With the aim of optimizing the overall management of infrastructure and setting clear goals, eight critical success factors required to create and implement a sound strategic infrastructure
management plan (SIAM) were identified. Next, a decision tool called SEMI (for social economic monitoring instrument) was developed that can help public organizations in making the right investment decisions at the right time. As a third option for increased efficiency, project costs were examined. Cost overruns in project realization must be kept below 5% so that the public administration can realize its full investment plan within the same budget. Finally, recommendations are made on how to reduce these cost overruns, namely by focusing on relational problems during the development phase, and not just technical problems. For instance, good collaboration and stakeholder management with the parties involved can reduce cost overruns. Applying these four recommendations allows public organizations, responsible for providing public infrastructure in a country, to manage their infrastructure portfolio in a more efficient way. This enables them to better meet the increasing and changing demands of society without having to allocate additional financial resources.